



DEVELOPMENT APPLICATION ESD STATEMENT

Gosford Regional Library

123A Donnison Street, Gosford NSW 2250

PREPARED FOR

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Ref: SY200096-SER01

Rev: B

Date: 02.08.2021

Development Application ESD Statement

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
14.09.2020	1	Draft	P. Shah	M. Santos
20.10.2020	A	Final DA Issue	P. Shah	M. Santos
02.08.2021	B	Updated DA Issue	P. Shah	B. Park

Image on the front cover is the 3D render of the proposed Gosford Regional Library, courtesy Lahznimmo Architects.

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Table of Contents

1. General	3
1.1 Introduction.....	3
1.2 The Development	3
1.3 Proposed Development.....	4
2. NCC 2019 Section J Compliance	5
2.1 Climate Zone	5
2.2 Building Envelope	5
3. Basis of ESD and Wellbeing Strategy	6
4. ESD and Wellbeing Initiatives for Gosford Regional Library	7

1. General

1.1 Introduction

Northrop Consulting Engineers Pty Ltd (Northrop) have been engaged to prepare an Ecologically Sustainable Development (ESD) statement to accompany the Development Application for the proposed Gosford Regional Library at 123A Donnison Street, Gosford NSW 2250.

1.2 The Development

The site is located at 123A Donnison Street, Gosford NSW 2250, within the Gosford City Centre in the Central Coast Council Local Government Area (LGA) and is currently known as 'Parkside' development. The site is approximately 0.14 hectares, situated between commercial development to the west, tertiary education and the Uniting Church to the east, Donnison Street to the north and a carpark accessible off Henry Parry Drive to the south. Figure 1 below shows the aerial image of the current site.

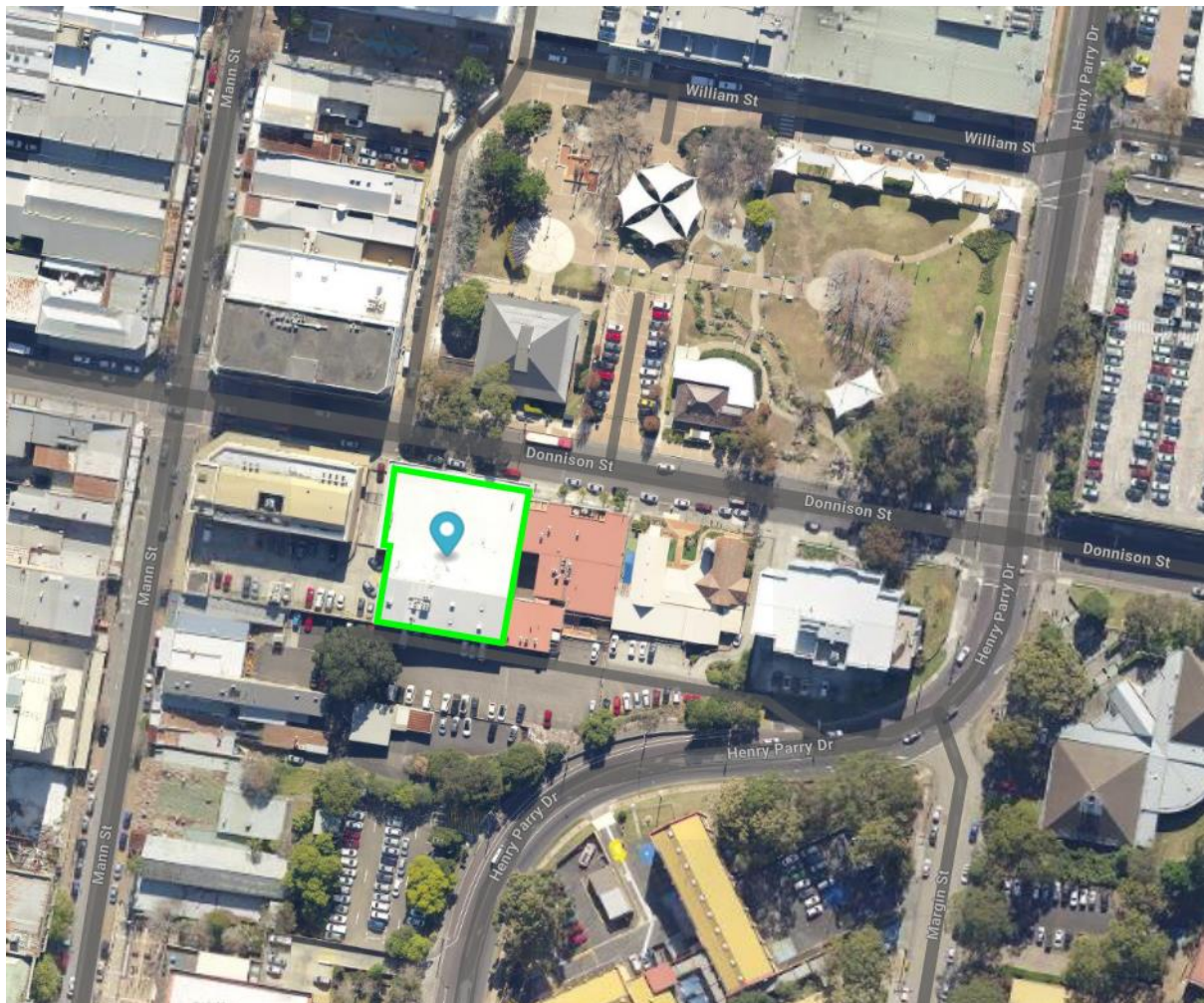


Figure 1 Aerial Image of the current site for the proposed Gosford Regional Library

1.3 Proposed Development

The proposed development at 123A Donnison Street, Gosford, proposes to knock-down and rebuild the existing development as a community hub, incorporating:

- A library;
- A multi-use hall;
- Council meeting rooms;
- An Innovation Hub (work space);
- General amenities;
- Loading bay; and,
- Provision of existing car parking spaces on the adjoining site to the rear at 123B-125A Donnison Street (Lot 11 DP 746819).

The development is proposed to be accessed from Donnison Street by pedestrian traffic at ground level and have a vehicular access loading bay from the carpark off Henry Parry Drive at first level to the south-east.

2. NCC 2019 Section J Compliance

The proposed development is seeking compliance with NCC 2019 Section J compliance.

2.1 Climate Zone

Gosford Regional Library is to be located at 123A Donnison Street, Gosford NSW 2250, which is identified as being within Climate Zone 5 of the ABCB Climate Zone map shown below.

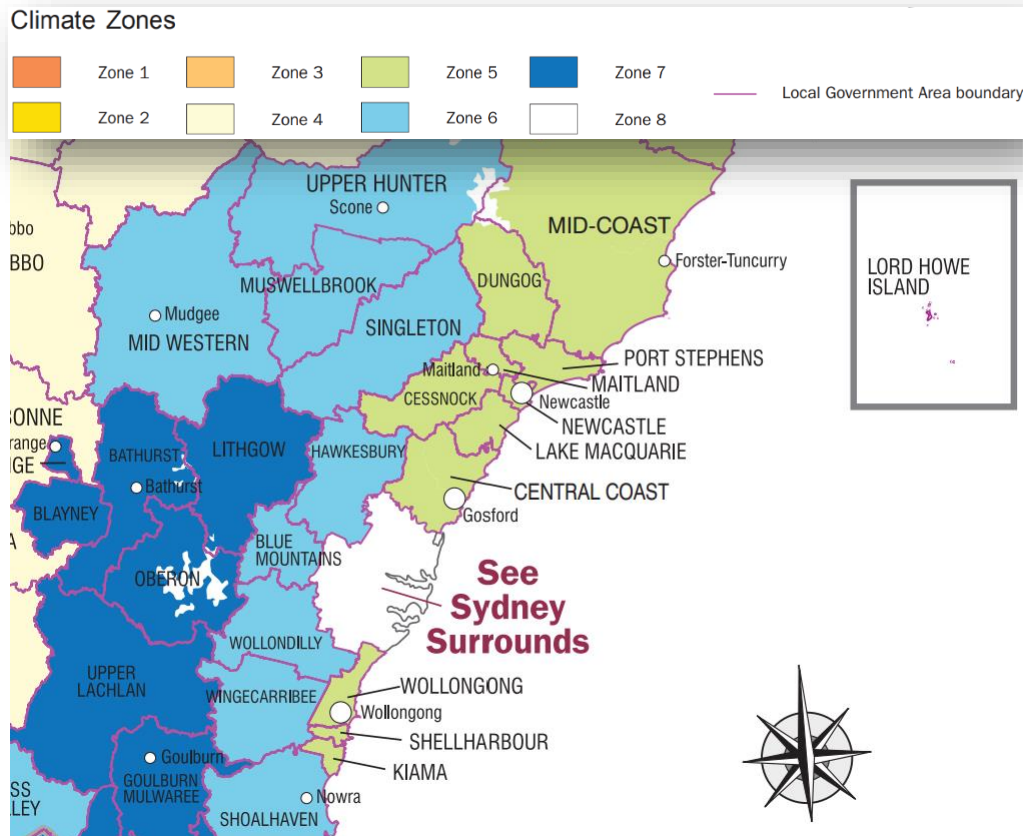


Figure 2 Part-NSW Climate Zone Map

2.2 Building Envelope

The building envelope of the concept design for the development have been developed in conjunction with the architects to meet the Section J requirements of NCC 2019.

The development has glazing on the north, east and south facades, with majority of the glazing provided with shading. Based on the preliminary analysis of the glazing, shading and orientation it showed that the design will meet the building envelope requirements of Section J NCC 2019. A detailed JV3 modelling and assessment will be conducted and finalised during the construction documentation stage.

3. Basis of ESD and Wellbeing Strategy

The basis for the Ecologically Sustainable Design (ESD) and Wellbeing Strategy for the proposed Gosford Regional Library are the following two underlying themes:

- **Reduce greenhouse gas emissions:** This is based on Central Coast Council signing on Climate Emergency declaration in August 2019.
- **Provide enhanced occupant comfort:** This is based on the project being designed as a community hub (as an extension of the living room of the residents of Gosford).

The building's design, construction and operation will integrate ESD (including energy efficiency) and occupant wellbeing initiatives, at a best practice level.

The following ESD and occupant wellbeing themes has been the focus of the project team:

- **Energy Efficiency:** reduce energy use and greenhouse gas emissions. The building's envelope and services have been integrated in the concept stage and will be detailed further in the next stage
- **On-site renewable energy:** generate on-site renewable energy to reduce reliance on grid electricity. The building will accommodate solar photovoltaic array on the roof to generate on-site renewable electricity and reduce greenhouse gas emissions associated with grid electricity.
- **Occupant wellbeing:** provide best practice indoor environment quality in the building's design to maximise occupant comfort addressing issues such as thermal comfort, visual comfort, acoustic comfort, biophilic environment and improved air quality.
- **Water efficiency:** minimise potable water consumption by using non-potable water for non-potable demands.
- **Materials Impact:** minimise impact of materials demand on the environment, by replacing them with low impact materials
- **Transport Impact:** encourage alternative mode of transport that reduces car reliance and provide initiatives to support new low emission technologies
- **Social Impact:** encourage focus on indigenous involvement and local procurement
- **Discharge from site:** encourage impact of the proposed development on the wider environment and the council's infrastructure.

This strategy will be used as a guiding lighthouse throughout the course of the project. A detailed list of ESD and Wellbeing Initiatives have stemmed out of the strategy themes. These initiatives have been outlined in the next section. These initiatives will be further integrated and assessed during the next stage of the project.

4. ESD and Wellbeing Initiatives for Gosford Regional Library

The project team have, in effect, pursued an integrated design framework, led by the ESD consultant working closely with the architect and the services consultants as well as structural and civil engineers, in order to integrate the aforementioned ESD (Ecologically Sustainable Design) and Wellbeing strategies in the design of the proposed Gosford Regional Library. The ESD and Wellbeing initiatives in the Gosford Regional Library are outlined in the Table below.

Table 1 ESD and Wellbeing Initiatives in Gosford Regional Library

ESD and Wellbeing Themes	ESD and Wellbeing Initiatives in Gosford Regional Library
Energy Efficiency	<p>Improved Building Envelope</p> <p>The project team intends to consider the following during the design development stage and beyond:</p> <ul style="list-style-type: none"> • Improved wall system with insulation to minimise conductive heat gain/loss through the walls. • High performance low-E glazing to minimise conductive heat gain/loss through windows. The low-E glass will also allow solar radiation enter the space in the cooler months, and will retain the heat inside, to minimise the heating through air conditioning. • Orientation of windows facing northeast on the faceted façade on north, rather than facing northwest, would allow morning sun but minimise heat loads associated with afternoon sun. • Effective shading to the windows through either a horizontal shading above the windows facing northeast or a deep roof overhang.
	<p>Reduce Greenhouse Gas emissions</p> <ul style="list-style-type: none"> • The proposed development intends to reduce the greenhouse gas emissions by 10% when compared with a NCC Section J Code Compliant building. This will be modelled and assessed through Section J JV3 modelling. • High efficiency appliances (dishwashers, refrigerators, microwaves, etc.) are intended to be specified that reduces the operational greenhouse gas emissions.
	<p>Pathway to carbon neutral</p> <ul style="list-style-type: none"> • By choosing no natural gas connection to the site, the proposed development has taken a step closer to a carbon neutral operation. This is because an all-electric consumption can be offset by either Accredited GreenPower or a bulk Power Purchase Agreement mechanism. • The proposed development intends to specify lower global warming potential refrigerants in the design development stage of the project.

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	<p>Improved HVAC (heating ventilation and air conditioning) system</p> <ul style="list-style-type: none"> • High efficiency fans, pumps and equipment will allow better coefficient of performance in operation • Economy Cycle is intended to be built into the design of the HVAC system to allow 100% ambient air to be introduced inside the building, when the outdoor conditions are appropriate to do so. • Demand Controlled Ventilation system is intended to be incorporated by way of installing carbon dioxide (CO₂) sensors in the occupied zone. This initiative will modulate the supply to conditioned air based on the occupancy, through carbon dioxide as a proxy, to determine the quantity of fresh air required to be conditioned and introduced in the space. <hr/> <p>Lighting zoning and controls</p> <ul style="list-style-type: none"> • Lighting control zones are intended to be broken down by functional uses. Considerations will be made to limit the lighting control zones to less than 100 m². • Digitally addressable lighting interface (DALI) lighting control system is intended to be installed to allow controlling various lighting control zones • Perimeter zone lighting controlled by daylight sensors will be considered. • All lighting will be flicker free (i.e. will have electronic drivers) as well as will have high levels of colour rendering index, with a CRI of >80. • All lighting will minimise glare and will create a sense of interest by varying the lighting intensity to suit the functional requirements.
On-site Renewable Energy	<p>Solar Photovoltaic</p> <ul style="list-style-type: none"> • The proposed development includes a solar photovoltaic array of approximately 60 kWp on its roof. On-site solar photovoltaic system is an efficient way to minimise reliance on the grid electricity and also reduce the ongoing operational cost associated with electricity consumption of the proposed development.
Occupant Wellbeing	<p>Air quality</p> <ul style="list-style-type: none"> • The proposed development intends to accommodate high efficiency filtration media at the outdoor air intake to offer high quality of indoor air to the occupants, free from dust and particular matter. • Paints, adhesives, sealants and carpets are intended to be specified that has Low volatile organic compounds (VOCs). • Engineered wood used in joinery and flooring (such as plywood, blockwood, medium density fibreboard, etc.) is intended to be

ESD and Wellbeing Themes	ESD and Wellbeing Initiatives in Gosford Regional Library
	<p>procured such that it has low formaldehyde emissions.</p>
	<p>Thermal Comfort</p> <ul style="list-style-type: none"> The heating ventilation and air conditioning (HVAC) system is intended to provide for a wider band of air temperature to accommodate the thermal comfort needs for a wider population group.
	<p>Visual Comfort</p> <ul style="list-style-type: none"> The proposed development intends to have a reasonable amount of daylight, balancing out the thermal comfort and energy efficiency requirements of the development. Access to views have been maximised, by orientating the windows towards the park, across Donnison Street.
	<p>Acoustic Comfort</p> <ul style="list-style-type: none"> Variety of acoustic treatments are intended to be implemented throughout the proposed development, based on the functional needs.
	<p>Biophilic Environment</p> <ul style="list-style-type: none"> The proposed development intends to create an internal environment that emulates warm palate, patterns and images of the natural environment, through Biophilic framework. Benefits of biophilia include improved cognitive function, reduction in cortisol (stress hormone), improved ability to process complex information and an overall sense of calmness.
	<p>Healthy and Sustainable Cleaning</p> <ul style="list-style-type: none"> Following the practical completion, it is envisaged that the Central Coast Council would benefit significantly through an ongoing emphasis on indoor air quality as well as health of the occupants, by procuring healthy and sustainable cleaning regime. This will be further explored in the next stage of the project.
Water Efficiency	<p>Rainwater capture and use</p> <ul style="list-style-type: none"> The proposed development has an in-ground rainwater tank to store approx. 20,000 litres, diverted from the roof of the development. This rainwater will be used to irrigate landscaping as well as for toilet flushing purposes.

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	<p>Water fittings and fixtures</p> <ul style="list-style-type: none"> The proposed development intends to specify high efficiency water fittings and fixtures that minimises water consumption.
	<p>Native Landscaping</p> <ul style="list-style-type: none"> The landscaping intends to specify water wise plants, such as native and indigenous plants. This will reduce the amount of water required for irrigation.
Materials Impact	<p>Sustainable Products</p> <ul style="list-style-type: none"> The proposed development intends to specify and install sustainable products that are responsibly manufactured and have sustainability credentials, such as, <ul style="list-style-type: none"> Reused products; Products containing recycled content; Products with environmental product declarations; Products with third party certifications; and, Manufacturers with stewardship programs. There is an intention to procure at least 50% of the timber that carries either PEFC or FSC timber certification schemes, through Chain of Custody certificates.
	<p>Low carbon Materials</p> <ul style="list-style-type: none"> Project intends to consider low carbon concrete, containing substitutions for Portland cement between 10% to 20% of supplementary cementitious materials such as fly ash, granulated furnace slag or silica fume. Project intends to consider sourcing responsible steel (either reinforcing or structural steel) that is manufactured by Responsible Steel Manufacturer (a member of World Steel Association's Climate Action Programme).
	<p>Responsible Materials</p> <ul style="list-style-type: none"> The project team intends to consider procuring PVC containing products that are manufactured with best practice PVC guidance from the Green Building Council of Australia.
Transport Impact	<p>Bicycle rails and/or storage</p> <ul style="list-style-type: none"> The proposed development includes bicycle rains in front of the

ESD and Wellbeing Themes	ESD and Wellbeing Initiatives in Gosford Regional Library
	<p>building at the pedestrian access through Donnison Street. This would allow residents who live close by to utilise bicycle as a mode of low-greenhouse gas emitting transport.</p> <ul style="list-style-type: none"> The proposed development also includes bicycle parking for the staff, inside the development, on the Ground Floor, near the landscaped area on the south.
Social Impact	<p>Active involvement with Indigenous community</p> <ul style="list-style-type: none"> Considerations will be made to actively involve indigenous community in seeking their input for various aspects of the design.
	<p>Local Procurements of Construction teams</p> <ul style="list-style-type: none"> Considerations will be made to target at least 10% of the construction team to be located in or around Gosford. This could potentially boost local economy.
Discharge from Site	<p>Stormwater</p> <ul style="list-style-type: none"> The proposed development intends to manage the quality as well as quantity of stormwater discharge from the site, through a combination of rainwater capture and reuse, on site detention tank and filtration system to improve quality of the stormwater.
	<p>Light Pollution</p> <ul style="list-style-type: none"> The development intends to minimise the impact of the light pollution to both neighbouring properties as well as night sky, by way of lighting controls turning of lights at nighttime, as well as appropriate shading and blinds to the windows.