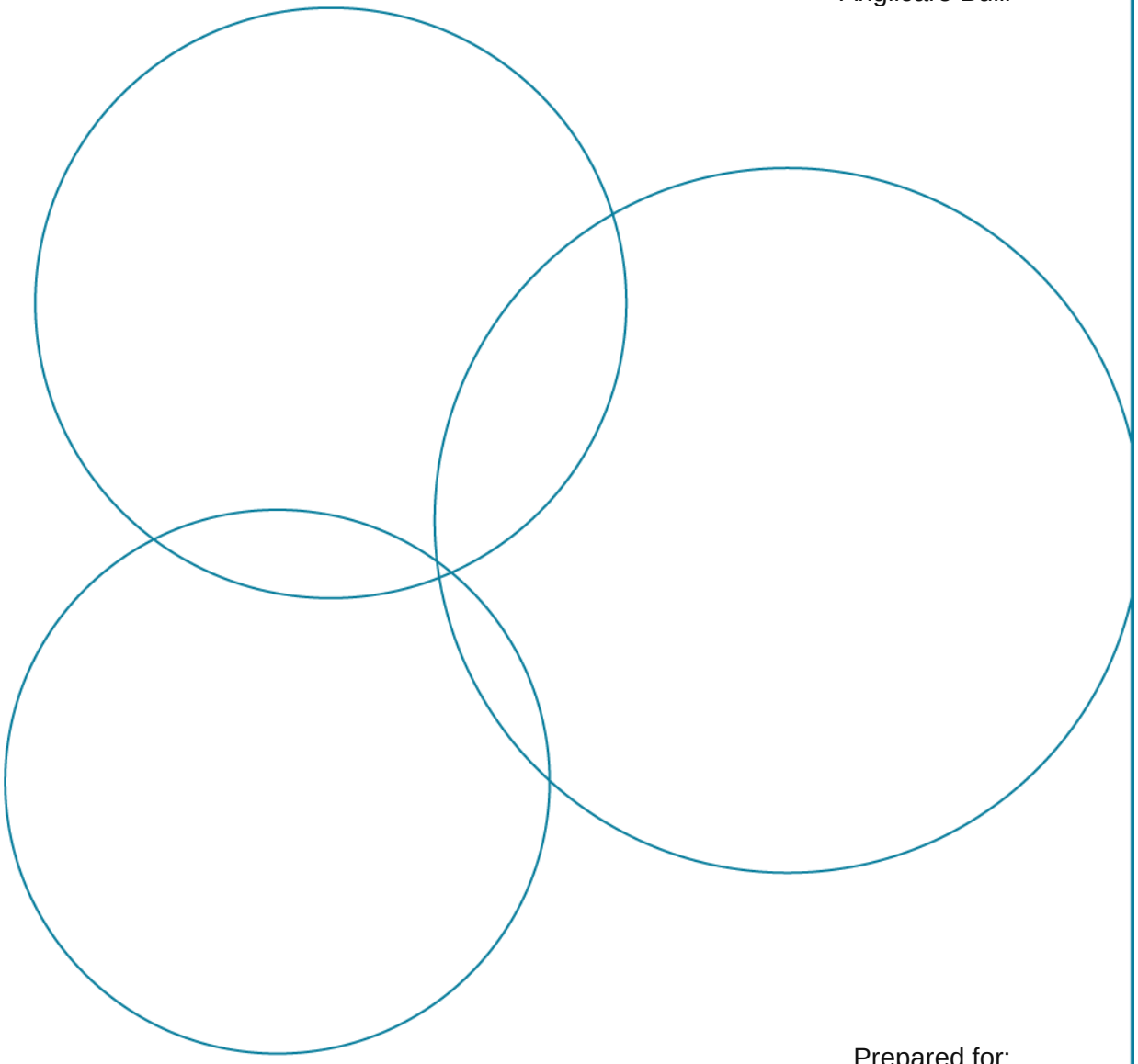
25-July 2018

Ecologically Sustainable Development Strategy

Anglicare Bulli



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Executive Summary

This report outlines how ecologically sustainable development (ESD) principles will be incorporated into the design, construction and ongoing operation of Anglicare's Village Bulli project at Sandon Point.

The project will be designed according to best practice ESD principles across a wide range of environmental impact categories including energy, water, passive design, waste, indoor environment quality, materials and ecology.

1 Introduction

This report has been written in support of a proposed section 75w modification to the approved Sandon Point ARV Concept Plan (MP06_0094)

The Sandon Point Concept Plan was approved by the Minister for Planning on 21st December 2006 for land at Sandon Point comprising a residential subdivision (for Stockland) and retirement development (for Anglicare).

Stockland has modified the Concept Plan on four separate occasions and development on those lands is now substantially complete. To date no development has occurred on the Anglicare (ARV) lands.

The approved Concept Plan allows for the following development of the Anglicare lands:

- A residential aged care facility up to four storeys containing up to 120 beds;
- A mix of apartment buildings of up to 3 storeys containing up to 250 independent living units;
- Community facilities and services to support residents of the retirement village;
- Access and car parking;
- Landscaping including rehabilitation of riparian corridors and forest; and
- Stormwater management and utility services.

The proposed modification application retains the above land uses within the Central Precinct. It also proposes the introduction of standard medium density residential accommodation in the Hilltop and Ocean View Precincts. The proposal also seeks to modify the road layout approved on the site. No change is proposed to the land use zoning (developable area), height or floorspace ratio controls. The forest and riparian rehabilitation and protection measures also remain generally the same.

Figure 1 shows a concept masterplan of the development, which includes the following:

- 80 bed Residential Aged Care Facility (RACF) (120 previously approved)
- 140 Independent Living Units (ILUs) (250 previously approved)
- 55 townhouses

Figure 1 – Concept masterplan with indicative building footprint

2 ESD Planning Requirements

The Secretary's Environmental Assessment Requirements (SEARs) include the following item:

> *14. Ecologically Sustainable Development (ESD)*
> *Identify how best practice ESD principles would be incorporated into the development.*

Ecologically sustainable development, as defined by the *Environmental Planning and Assessment Act 1979*, requires the effective integration of economic and environmental considerations in decision-making processes. Minimum requirements apply to the proposed development including the National Construction Code (NCC) Section J for Energy Efficiency and the *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004*.

The project will also comply with Wollongong Development Control Plan (DCP) 2009 Chapter A2: Ecologically Sustainable Development which states that:

> *Through the application of ESD, development should be sited, designed and constructed taking into consideration the principles of ESD, and comply with the following objectives.*
>
> *(a) Greenhouse gas emissions will be reduced.*
>
> *(b) Potable water use will be reduced.*
>
> *(c) Development can adapt to climate change.*
>
> *(d) Waste will be reduced.*
>
> *(e) Recycling of waste and use of products from recycled sources will be increased.*
>
> *(f) Energy that is used will be renewable and low carbon.*
>
> *(g) Indoor environmental quality is improved.*
>
> *(h) The environmental impacts from building materials will be reduced through reduction, reuse and recycling of materials, resources and building components.*
>
> *(i) Biodiversity values are improved.*

Details on how ESD initiatives will be incorporated into the project are provided in Section 4: Recommended ESD Initiatives.

3 Site Analysis

The Village Bulli project site comprises approximately 8 hectares of land at Sandon Point within a 53-hectare greater development site (shared with a residential subdivision). Sandon Point is located within the Wollongong LGA and is approximately 14km north of the Wollongong CBD. This site is bound by parkland and private land holdings to the north, a railway line to the west, an estate development to the south and the eastern coastline 2km to the east (see Figure 2). The Illawarra escarpment is located 11km to the west of the project site and plays an important role in the local weather conditions.

Figure 2 – Site location

A Turpentine forest covering just over 1 hectare in the central part of the site and Cookson's Creek riparian corridor runs through the centre of the site (see Figure 3).

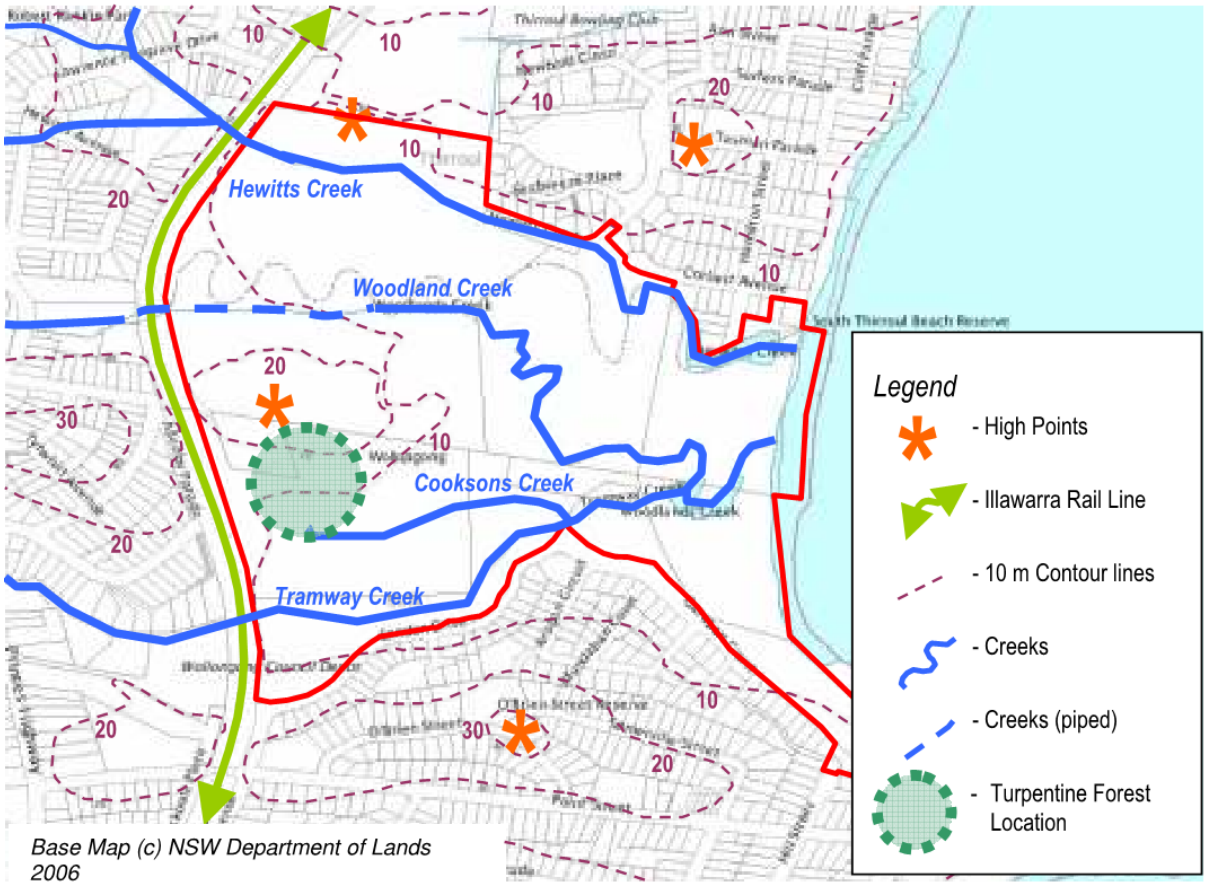


Figure 3 – Key topographical feature, Sandon Point

3.1 Climate Data

For an understanding of the local climate we can use Bureau of Meteorology data for Bellambi AWS (located 5km south of the development site).

Site name: BELLAMBI AWS

Site number: 068228

Latitude: 34.37 °S **Longitude:** 150.93 °E

Elevation: 10 m

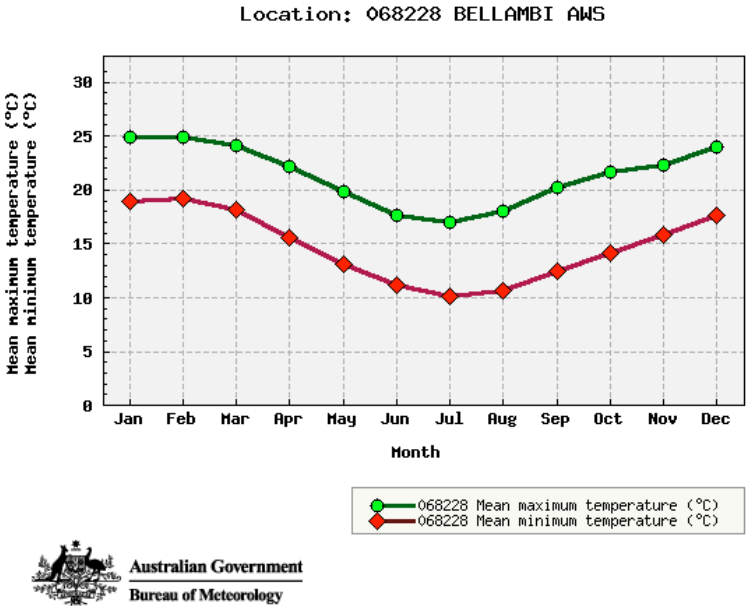
Commenced: 1988 **Status:** Open

Latest available data: 28 Jun 2018

3.1.1 Temperature

The climate is mild, and generally warm and temperate. The annual mean maximum temperature is 21.4°C and the annual mean minimum temperature is 14.8°C.

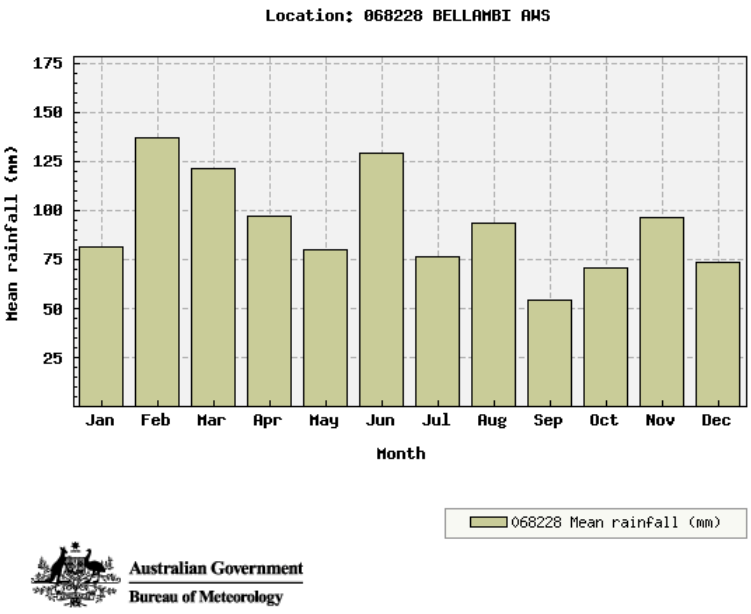
This makes the development very well- suited to utilising natural ventilation for the majority of the year. The development should therefore incorporate a high amount of openability to take advantage of when ambient conditions are favourable (18-26°C).



3.1.2 Rainfall

Rainfall is well distributed throughout the year and is often associated with orographic lift caused by the escarpment. This occurs when moist air is forced up the side of an elevated land formation resulting in adiabatic cooling. Orographic clouds form which serve as the source of the precipitation, most of which fall upwind of the mountain ridge.

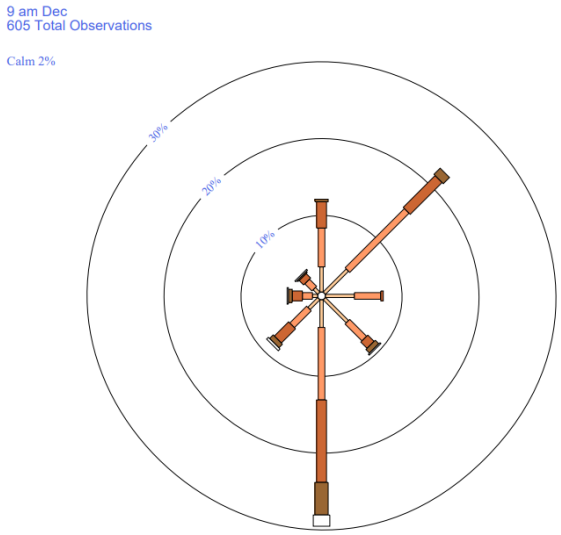
The amount and distribution of rain is highly supportive of the use of rainwater harvesting for reuse as part of the developments water strategy.

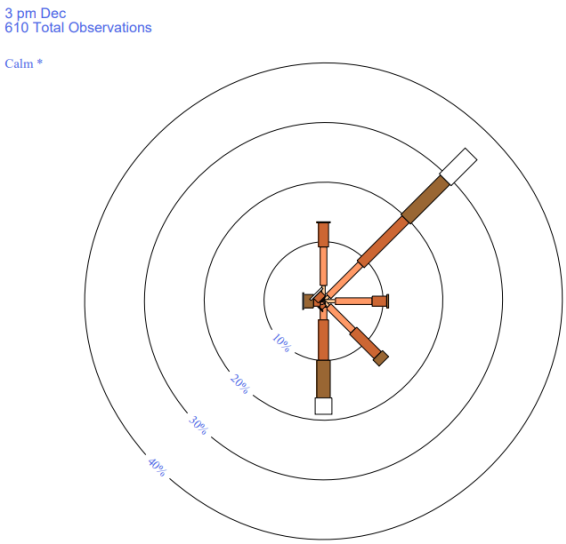


3.1.3 Wind

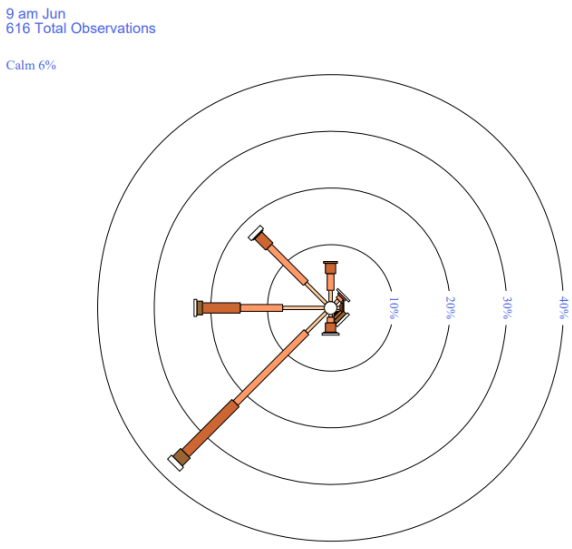
The location benefits from the sea breezes associated with the proximity to the coast, which can provide relief from the summer heat. Prevailing summer winds are north-easterly and southerly. Winter winds are more variable, with some bias to south-westerlies. The development should make the most of the relief of summer winds in terms of openability for natural ventilation (especially from the south). On the other hand, wind-tunnelling between buildings should be avoided and external common areas should offer protection from harsh winter winds

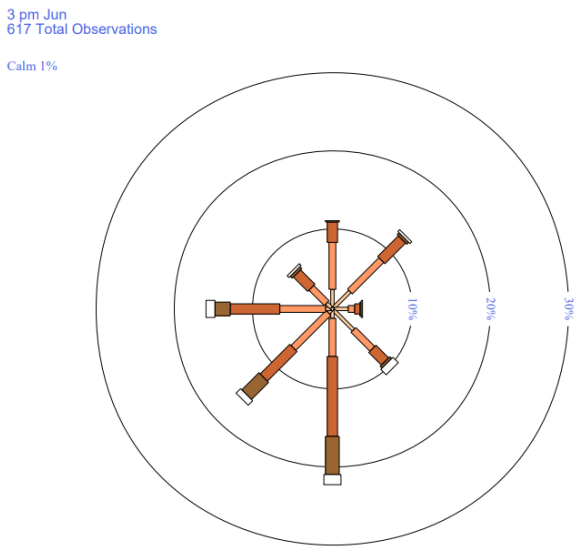
Summer



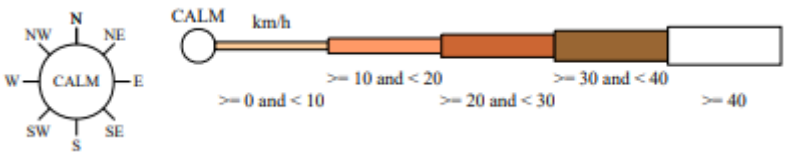


Winter





Legend



4 Recommended ESD Initiatives

The project will be designed according to best practice principles of ecologically sustainable development (ESD).

4.1 Energy

(a) Greenhouse gas emissions will be reduced.

(f) Energy that is used will be renewable and low carbon.

The National Construction Code (NCC) Section J sets minimum energy performance requirements for all new developments, which cover air-conditioning, ventilation, lighting, power and hot water, as well as building fabric considerations including thermal construction and insulation, building sealing, glazing and shading. The proposed design will meet the NCC Section J energy efficiency requirements.

Further to this, Council encourages the use of the most efficient water and energy appliances and systems, natural ventilation, efficient heating and cooling systems and renewable energy in order to minimise greenhouse gas emissions resulting from the development.

Recommended energy related initiatives include:

- Minimising the use of mechanical ventilation to reduce energy consumption.
- Efficient lighting systems including LED lighting with efficiency controls. This includes internal as well as external and public domain lighting.
- Low carbon domestic hot water (DHW) systems such as solar thermal hot water or heat pumps.
- On-site renewable energy generation such as rooftop photovoltaics.
- Undertaking best practice commissioning and tuning for all building systems.

4.2 Water

(b) Potable water use will be reduced.

Mains water use will be minimised for the project by reducing overall demand and utilising recycled water for non-potable uses.

Recommended water related initiatives include:

- Selecting water efficient fittings, fixtures and appliances, e.g. AAA-rated shower roses and taps, and dual-flush toilets.
- Incorporate rainwater tanks to provide water for toilet flushing, hot water tanks and garden uses.
- Specify smart water efficient irrigation systems such as subsoil drip irrigation with moisture sensors.
- Introducing the new community to the water sensitive approach used in the development and encouraging them to support the approach through their active cooperation.

4.3 Passive Design

(c) Development can adapt to climate change.

Taking into consideration the site and context analysis, the principles of passive design should be used to refine the design and siting of the development. Passive design involves designing a development for the local climate, orientating to achieve good passive solar heating in winter and cooling in summer, insulating, careful consideration of glazing and considering the thermal mass of construction materials.

Recommended passive design related initiatives include:

- A high amount of openability to allow for effective natural ventilation
- Well-performing façade incorporating low-e solar control glazing
- Well-insulated building fabric
- Deciduous trees for seasonal shading
- Maximise natural sunlight to living spaces to improve residential amenity and minimise the use of artificial light.
- Maximise number of dwellings with dual orientation.
- Shading devices should be utilised where necessary, particularly where windows of habitable rooms are located on the western elevation.
- Climate change adaptation and resilience should be considered to enable the building to adapt to potential climate changes and extreme weather events with the intention of minimising risk and disruption to the occupants, the building and the community.

4.4 Waste

(d) Waste will be reduced.

(e) Recycling of waste and use of products from recycled sources will be increased.

A Waste Management Plan (WMP) will be prepared outlining best practice waste management during the design, construction and operation of the project to divert waste from landfill.

Recommended waste related initiatives include:

- Reducing the amount of materials used in the construction of a building wherever practical
- Implementing best practice construction waste management plans and engage with the supply chain.
- Providing facilities for collection and separation of major waste streams for collection by the relevant waste contractor in operation.
- Providing infrastructure and guidance to maximise waste recycling during operation.

4.5 Indoor Environment Quality

(g) Indoor environmental quality is improved.

Indoor Environmental Quality (IEQ) will be improved through consideration of indoor air quality, acoustic, thermal and visual comfort, as well as daylight and views. IEQ strategies are outlined in further detail below.

Recommended Indoor Environment Quality (IEQ) related initiatives include:

- Designing ventilation systems with consideration of maintenance access and minimum separation distances between pollution sources and outdoor air intakes.
- Protecting ductwork during construction to minimise contamination with debris and moisture prior to occupation.
- Selecting paints, adhesives, sealants and floor coverings which have low Volatile Organic Compound (VOC) emissions, and engineered wood products with low formaldehyde emissions.
- Locating busy, noisy areas next to each other and quieter areas near other quieter areas
- Minimising the amount of party (shared) walls with other private rooms (use storage or circulation zones to buffer noise from adjacent private rooms).
- Using double-glazed windows and/or laminated windows, solid walls, appropriate insulating building elements and adequate sealing to provide satisfactory acoustic privacy and amenity levels for the occupants.
- Appropriate sound attenuation measures should be considered between each floor in the development, to minimise potential sound transmission into any residential apartment below.
- Considering availability of daylight and maintain connections to external views.
- Using internal blinds to help maximise visual comfort by controlling glare.
- Considering appropriate colour perception and lighting levels and reduce discomfort glare from artificial lighting.
- Considering occupant thermal comfort by utilising passive design and careful design of air-conditioning systems.

4.6 Materials

(h) The environmental impacts from building materials will be reduced through reduction, reuse and recycling of materials, resources and building components.

Materials used in construction are responsible for waste generation, resource depletion, GHG emissions and water consumption. This development will seek to minimise these impacts compared to a standard development.

Recommended materials related initiatives include:

- Reducing the use of Portland cement in concrete mixes by replacing with an industrial waste product such as fly ash.
- Using reclaimed water and manufactured sand in cement mixes.
- Selection of responsible steel products sourced from accredited steel makers and fabricators.
- Selection of certified timbers, and Best Practice Certified PVC products.
- Specification of sustainable products where appropriate, such as those containing recycled content, third-party environmentally certified products, and those with product stewardship agreements in place.
- Designing building components, including the structural framing, roofing and facade cladding for longevity, adaptation, disassembly, re-use and recycling.
- Local procurement to support the local economy and reduce transport emissions.

4.7 Ecology

(i) Biodiversity values are improved.

The development must aim to maintain, conserve and enhance indigenous species, populations and ecological communities present prior to, during and post construction.

Recommended ecology related initiatives include:

- The use of local indigenous species to enhance wildlife corridors and contribute to the amenity of the area.
- Maintaining and enhancing existing vegetation. Landscaped areas should aim to enhance existing wildlife corridors onsite and adjacent to the site, and may include the preservation and reuse of topsoil.
- The use of deciduous trees to provide shade in summer and allow sunlight infiltration during winter.
- Increasing landscaped areas to enable water infiltration and decrease hard surfaces.
- The incorporation of green roofs and walls to assist in the regulation of the buildings temperature, as well as acting as insulation, improving air quality, enhancing biodiversity and reducing stormwater runoff.
- Water sensitive urban design principles including bioretention basins, swales and gross pollutant traps.
- Selecting refrigerants (where applicable) with an Ozone Depletion Potential (ODP) of zero.

5 Conclusion

The initiatives outlined in this report demonstrate how the proposed development can incorporate best practice ESD initiatives into its design, construction and ongoing operation. Through a combination of energy, water and other strategies, the project will exceed minimum requirements for sustainable development.