71 Fig Hill Lane, Dunmore NSW

Ecological Sustainable Development Report

Prepared for: Contract Properties Pty Ltd

Attention: Shellharbour City Council

Date: 15 Oct 2019

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Ref: 43176

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Revision

Revision	Date	Comment	Prepared By	Approved By
01	05.09.2019	Draft DA Report	NCJ	NCJ
02	15.10.2019	DA Report	NCJ	NCJ

Contents

1. Executive Summary

This Ecological Sustainable Development Report has been prepared on behalf of Contract Properties Pty Ltd. for the proposed eco-village development to be located at 71 Fig Lane, Dunmore NSW.

The report provides an overview of the proposed Ecologically Sustainable Development (ESD) principles and sustainability initiatives to be included within the project and is intended to form part of the Environmental Impact Statement (EIS) for the Development Application to Shellharbour City Council. This report forms a direct design response to the ESD Principles & objectives outlined within the Shellharbour City Council Local Environmental Plan (LEP) 2013 as amended.

This report includes:

- An overview of the sustainability drivers for the project (both regulatory & identified project drivers)
- Detail regarding specific ESD initiatives which will be implemented throughout all phases of the project; and
- Demonstration of assessment against a suitably accredited rating scheme to meet industry best

practice. Information contained within this report has been prepared in direct response to the:

- Shellharbour City Council – LEP 2013 –
  - Part 5.13 – Eco-tourist facilities;
  - Part 6.3 – Flood planning; and
  - Part 6.4 – Stormwater management
- NCC Section J – energy efficiency; and
- Eco-tourism Australia Standards.

In coordination with the above, the project will implement a number of sustainable design initiatives designed to mitigate the environmental impact:

- Energy – including improved energy efficiency across the development including commitments to passive thermal design, energy efficiency and on-site renewable energy supply;
- Water Efficiency – including reduced potable water demand and improved storm water quality;
- Materiality – considering the whole of life impact of materials and considering their selection to minimise harm to the environment, including efficiency, whole of life and construction impacts;
- Recognition of local ecology & environmental management.

The following sections detail the development's specific sustainable design response.

2. Introduction

This Ecological Sustainable Development Report has been prepared on behalf of Contract Properties Pty Ltd. for the proposed eco-village development to be located at 71 Fig Lane, Dunmore NSW.

The proposed development shall include:

- Demolition of existing non-inhabited dwelling on-site;
- Up to 33 independent guest lodges (accommodation rooms);
- Commercial restaurant, bars and communal lounge;
- Swimming Pool;
- Gymnasium;
- Beauty therapy center;
- Associated amenities;
- On-site car parking; and
- New Landscape.

The property is located within the existing Shellharbour City Council Municipal Zone.

This report addresses the ESD objectives & initiatives identified within the applicable legislative frameworks including Shellharbour LEP.

The project design response has utilised recognised industry best practice sustainable design principals and borrows elements from external industry recognised best practice sustainability standards with the intent to improve the overall environmental performance of the development and reduce the ecological impact to the immediate surrounding area in both construction and operations.

Figure 1: Proposed Development 3D Perspective. Source: Nordon Jago Architects.

2.1 Sustainable Design Frameworks

In pursuit of defining the applicable ESD design principles & initiatives nominated for inclusion within the development, the proposed mixed-use development is guided by the following applicable frameworks:

- Shellharbour City Council – LEP 2013;
- Recognised industry best practice standards (such as those referenced within Green Star standards and the like);
- NCC Section J – energy efficiency; and
- Eco-tourism Australian Standards

2.2 Shellharbour City Council – Local Environment Plan 2013

Shellharbour City Council LEP aims to ensure orderly and sustainable development occurs within the municipality, balancing it's economic, environmental and social requirements. In support of the local Development Control Plan (DCP), the LEP aims to ensure sustainable development via the following provisions:

Clause 5.13 – Eco-tourist facilities –

- The development will be located, constructed, managed and maintained so as to minimise any impact on, and to conserve, the natural environment;
- the development will promote positive environmental outcomes and any impact on watercourses, soil quality, heritage and native flora and fauna will be minimal;
- waste generation during construction and operation will be avoided and that any waste will be appropriately removed;
- any power and water to the site will, where possible, be provided through the use of passive heating and cooling, renewable energy sources and water efficient design;
- measures to remove any threat of serious or irreversible environmental damage;
- efficient and minimal energy and water use and waste output; and
- maintaining improvements on an on-going basis in accordance with relevant ISO 14000 standards relating to management and quality control

Clause 6.3 – flood planning –

- Taking account of flooding risks and the predicted impacts of climate change will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

Clause 6.4 – stormwater management –

- Includes, if practical, on-site stormwater retention for use as an alternative supply to mains water, ground water or river water; and
- Avoids any significant adverse impacts of stormwater run-off on receiving waters.

2.3 NCC Section J Energy Efficiency

NCC Section J – energy efficiency sets the minimum design provisions for building fabric design and associated energy demand performance for building design across the country. Section J includes minimum performance standards for items including external walls, floors, roofs, façade (glazing) and skylights associated with the building use type and standard operating hours. NCC 2019 Section J methodology has seen a significant overhaul to improve minimum performance standards as well as improve industry construction techniques and passive thermal performance.

3. Project Design Response

3.1 Project Design Framework

The following section details a provisional list of ESD initiatives for inclusion within the design & development of the project applicable to defined approach to sustainable development for the project. The following initiatives have been selected on the basis they align with the controls and objectives identified within the relevant Shellharbour City Council LEP/DCP and the principles of an eco-tourist development.

3.1.1 Energy Efficiency

A variety of energy efficiency measures are applicable to the proposed development. The proposed strategy combines the approach of passive thermal design, operational efficiency, architectural intent and site-specific appropriateness.

Energy efficiency measures, which will reduce energy usage & greenhouse gas emissions, include:

Passive Thermal Design

- Optimised design for effective natural daylight into guest rooms and communal zones within the building facades.
- Glass selection to be considerate of passive thermal performance – solar control for summer, passive thermal heating optimisation in winter.
- High rated building fabric performance – high total R-values for thermal efficiency on exposed floors, external walls and exposed roof zones.
- Operable windows for mixed-mode space conditioning.
- High density materials to maximise the effectiveness of thermal mass and seasonal temperature variables.

The figure below illustrates the intent of passive thermal concepts via inclusion of high level glazing for natural daylight capture and external shading for protection of exposed glass façade during summer periods.

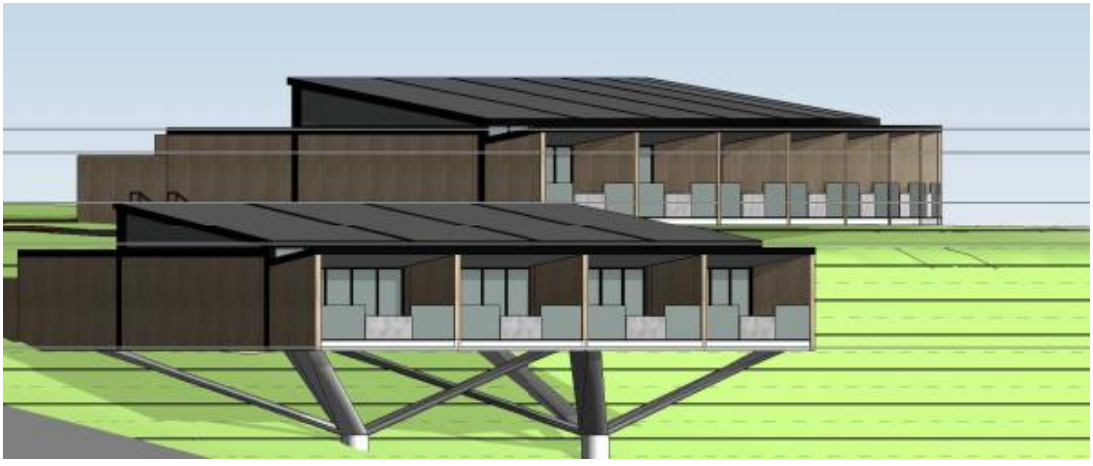

Figure 2: Passive thermal design concept 3D Perspective. Source: Nordon Jago Architects.

Electrical & Lighting

- Efficient lighting e.g. LEDs. This will reduce the electrical load on the grid for the same electrical output. Further, LED globes have a longer life, reducing replacement periods which demands less maintenance, as well as reducing landfill of precious materials
- Lighting controls including timing and occupancy sensors to reduce the demand on the lighting system.
- Optimised lighting zoning control in order to reduce energy demand & improve efficiency via localised lighting control.
- Sub-metering will allow for effective energy management & optimisation of building performance. Typical meter allocation is end-uses in excess of 10,000kWa/annually in accordance with Green Star standards.
- BMS building control will monitor & provide automated building operation & maximise energy efficiency.
- External lighting to timeclock and/or daylight sensor controlled for optimised energy efficiency.

Heating / Air-Conditioning Systems

- High efficiency, air-cooled centralized systems (per building) are proposed for space heating/cooling.
- Energy and water efficient appliances – lowering energy demand
- BMS building control will monitor & provide automated building operation & maximise energy efficiency.
- Economy cycle integration for suitable times of the year when outdoor ambient conditions don't require mechanical pre-treatment.
- Centralised gas hot water system (per building) for lower GHG emissions impact.
- Mixed-mode system with natural ventilation integration (includes read switches for optimized energy usage).
- Energy efficient swimming pool heating system (potential consideration of dual-purpose system to provide heating to both pool and restaurant zones to be investigated further during design development phase).

On-site Renewable Supply

- Inclusion of photovoltaic energy system to reduce overall energy demand for the hotel operations. It is envisaged a small-scale system up to a maximum of 99kW peak (size to be confirmed post DA approval).

  Indicative solar PV locations are detailed below (refer blue zones):

Figure 3: Indicative Solar Photovoltaic Panel locations (final locations TBC). Source: Nordon Jago Architects.

3.1.2 Water Efficiency

A variety of water efficiency measures are applicable to the proposed development. The following water efficiency initiatives are intended to influence the final design and operation of the spaces contributing to the project's overall commitment to reduce potable water demand. In addition, the initiatives are designed to address the projects response to stormwater management via the utilisation of on-site capture, storage and reuse in accordance with the LEP requirements (clause.

- Water efficient fixtures and fittings – includes taps, wash basins, WCs, Urinals, showers and supplementary water uses for student education.

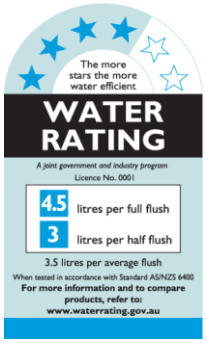

Figure 4. Example of a WELS water efficiency rating label.

In accordance with industry best practice standards, the following performance schedule identified within Green Building Council of Australia's – Green Star scheme will ensure potable water demand is effectively reduced:

Nominated WELS Fixtures – Green Star Design & As-built V1.2	
Fixture / Equipment Type	**WELS Rating (minimum)**
Taps	6 Star
Toilet	4 Star
Showers	3 Star (>6 but <= 7.5 L/min)
Dishwashers	2 Star

- Water meters linked to the BMS will ensure inefficiencies such leaks are detected prior to the significant loss of water.
- On-site rainwater harvest – offset for irrigation demand and/ or toilet flushing. Design concept to be developed further within design development phase post DA approval. Final solution to be reliant on available water supply. Refer additional commentary below.
- Proposed landscape selection/design will take account of potable water demand to ensure that it does not increase potable water demand. Native landscape shall be included where relevant as to not increase overall site demand.

- Air-cooled HVAC system eliminates potable water demand typically identified with a cooling tower design.
- Swimming pool top-up water to be sourced from recycled supply on-site reducing potable water demand.

3.1.3 Sustainable Materials & Building Components

Additional resources aside from energy & water are consumed by new developments. These include the building materials in the initial build, through to the materials consumed by on-going building maintenance. The following resource efficiency measures are intended to influence the project's overall ecological footprint & reduce the environmental impact of the project as a whole.

Construction Materials

Construction materials are a highly carbon intensive component of any development. They often involve very energy intensive production processes, large amounts of raw materials including water and energy, and long transport distances to reach the location of the development.

The following initiatives are proposed to be adopted by the project to reduce waste from construction materials.

- Sustainably sourced timber including recycled timbers (where available) and FSC/PEFC certified timbers or the like;
- Reduced Portland cement content within concrete; and
- A high recycling target of 90% diversion from landfill for the construction and demolition waste.

Design Materials

Improved indoor environment quality is a significant benefit of sustainable design. The design will include a significant commitment to improve indoor environment quality via the following initiatives:

- Thermal comfort provided by the bespoke air conditioning system, high thermal mass & availability to natural daylight & passive thermal performance.
- Material selections, which focus on reducing volatile organic compounds (VOC) levels and minimise formaldehyde impacts. Paints, sealants, adhesives, carpets, floor and material finishes will all comply with best practice VOC criteria as identified within Green Star – industry best practice standards.
- Engineered wood products will limit formaldehyde levels via architectural specification in accordance with industry best practice standards.
- Steel material to be sourced from suppliers who are signatories to the Australian Steel Institute Sustainability Charter ensuring the manufacture of steel products is sustainable and reduces energy demand.
- PVC materials will be procured from suppliers which comply with industry best practice guidelines for PVC manufacture which aims to reduce the environmental impact of PVC material production.
- Consideration of additional material specifications which select & prefer materials and products which include reused content, environmental product declarations, third party sustainability certifications or product stewardship programs.

Operational Materials

A dedicated Site Waste and Recycling Minimisation Plan (SWMP) will be prepared for the proposed development by an appropriately qualified waste consultant. The plan will seek to identify, quantify and classify the likely waste streams to be generated during both construction & operation and in addition, identify the appropriate servicing requirements.

In summary, the SWMMP identifies the following key objective & design responses:

- 90% recycling target for general construction waste consistent with industry best practice;
- Identification of likely waste streams & how each waste stream shall be treated for both construction & operation;
- Identification of storage locations & allocated waste resources;
- Signage requirements for optimised waste recovery / recycling; and
- Identification of monitoring & reporting schedules for optimised future waste management.

3.1.4 Ecological, Environmental & Construction Management

Further to the commitment of the energy, water and materiality elements of the project identified above, the following initiatives are aimed at ensuring the broader environmental and building management impacts are also addressed. These initiatives maintain the intent of the objectives identified within the LEP and seek to ensure the project adopts a holistic approach to ESD.

These initiatives include:

- Dedicated building commissioning & tuning undertaken in accordance with relevant industry best practice standards such as AIRAH and/or CIBSE Commissioning codes;
- Formalised environmental management system & plan during construction phase works to ensure impact to local ecology, environment and surrounding wetlands is limited;
- Re-use of previously developed urban site, limiting the extent of urban sprawl;
- Heat island effect reduction via appropriate design specification, on-site renewable energy supply and extensive inclusion of native vegetation;
- Stormwater management in accordance best practice WSUD principles including suitable provision for on-site reuse, reducing both potable water demand and also reduced run-off from site into surrounding water bodies;
- Reduced light pollution via appropriate external lighting design, limiting lighting spill beyond the built environment zone; and
- Reduced legionella risks via air-cooled HVAC selection.

4. Summary

Ecologically Sustainable Design is a driving consideration within the proposed eco-village development to be located at 71 Fig Lane, Dunmore NSW. As described within the report above, the development will incorporate a number of ESD initiatives in order to reduce energy demand & associated greenhouse gas emissions, potable water consumption and material resources of the project. Furthermore, there is a focus to ensure the ecological value of the immediate surrounding area including receiving water bodies are protected via the utilisation of on-site water/stormwater capture and reuse as well as the inclusion of native indigenous landscape design.

The proposed development's commitment to reducing the overall environmental impact is evident of the holistic approach taken to long-term sustainability. Documented initiatives cover a range of categories including:

- Energy & greenhouse gas emissions
- Potable water reduction
- Minimising waste to landfill
- The indoor environment;
- Occupant amenity and comfort;
- Local Ecology & overall environmental impact.

We trust this report provides sufficient overview of the project commitment to environmentally sustainable design and the sustainability vision for the proposed eco-village development located at 71 Fig Lane, Dunmore NSW.

Design with
community in mind

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