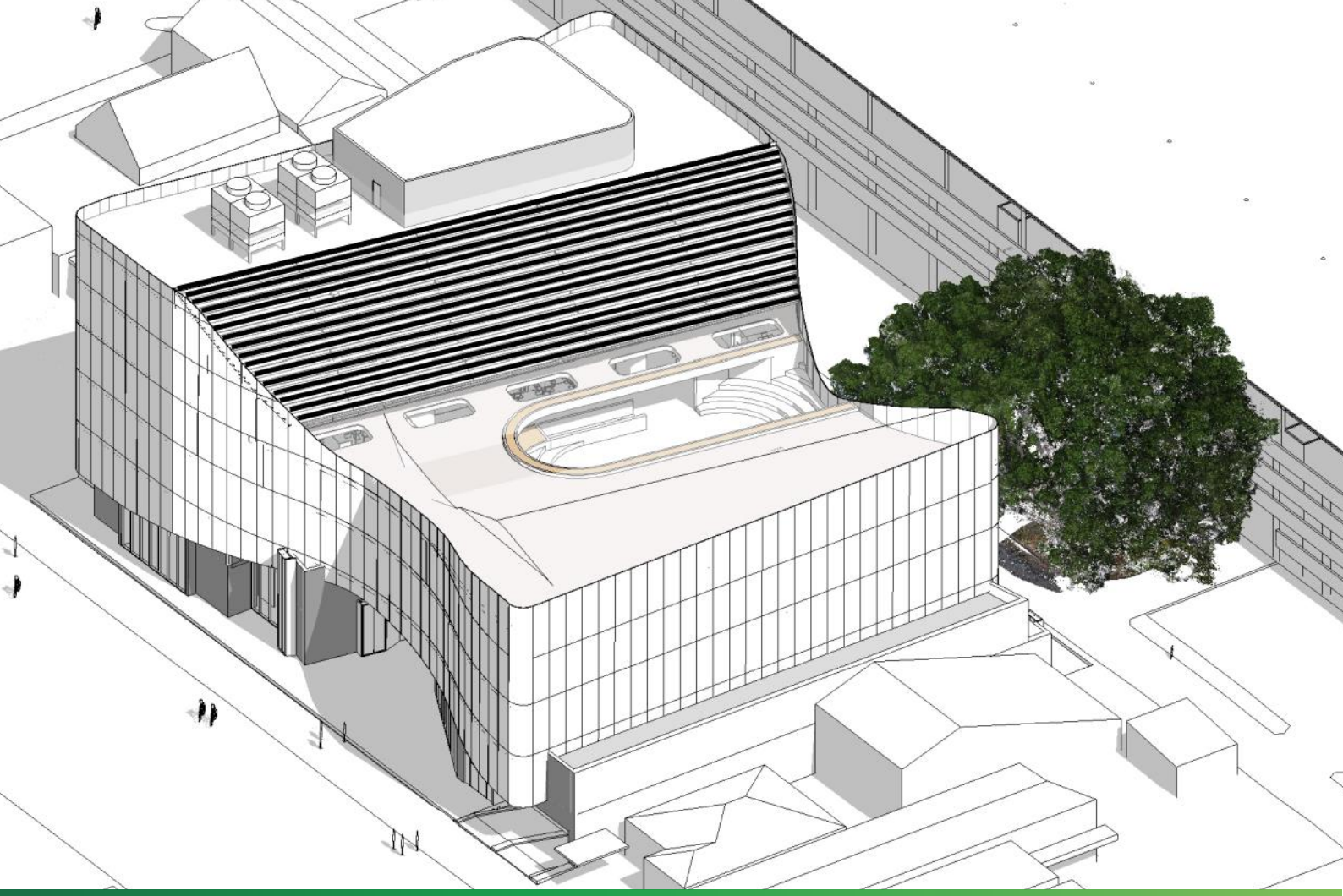

All Welcome
Cultural Civic Space Coffs Harbour

Ecological Sustainable Design

23-31 Gordon St, Coffs Harbour

Coffs Harbour City Council

Revision 00

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Revision Information

Project	All Welcome | Coffs Harbour Cultural Civic Space
Title	Ecological Sustainable Design
Client	Coffs Harbour City Council
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Revision Schedule

Revision	Date	Issue Name	Authorised
00-Draft	31/05/2019	DRAFT	LEP
00	05/06/2019	For Issue	LEP

1 Introduction

LCI has been engaged to provide an ESD Report for the proposed Coffs Harbour Cultural Civic Space development in Coffs Harbour, NSW. This report will form part of the documentation required to meet the Secretary Environmental Assessment Requirements (SEARs). The following items are included in this report:

- Details of how best practice ESD principles as defined by Part 7(4) Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design and ongoing operation phases of the development.
- Details of water conservation, including practical opportunities to implement water sensitive urban design principles with particular regard to measures to prevent pollution to the neighbouring creek.
- Details of energy efficiency, including practical opportunities to minimise energy consumption from non-renewable sources and to implement effective energy efficiency measure such as passive solar design.
- Details of how the proposed development will contribute to meeting the objectives of the Coffs Harbour Sustainability Policy (POL-079)

1.1 Project Description

The proposed Coffs Harbour Cultural and Civic Space (All Welcome) located at 23-31 Gordon Street, Coffs Harbour is bounded by Riding Lane to the North and Gordon Street to the South.

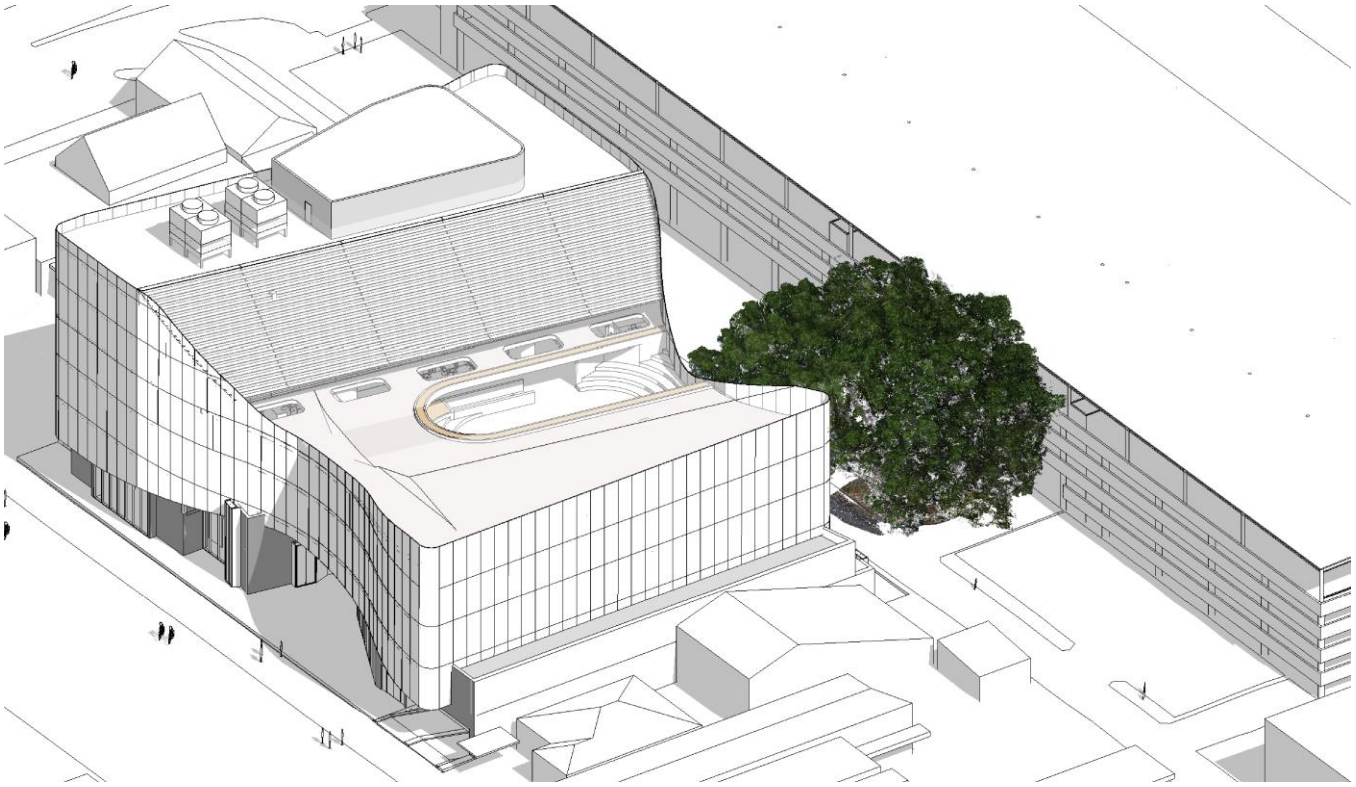

Figure 1: *Revit Model of Proposed Development*

The project comprises the construction of the following:

- Basement Level carpark
- Plant rooms
- Museum/ Gallery
- Commercial Office Space
- Internal and external event space
- Retail
- Roof Plant Space

2 ESD Planning Requirements

The following statutory requirements are to be met by the proposed development. These requirements can be met through incorporating the sustainable design features outlined in this report.

2.1 Secretary's Environmental Assessment Requirements (SEARs)

As part of the project's development application to the Department of Planning and Environment, the Secretary's Environmental Assessment Requirements (SEARs) for the project will need to be addressed. Section 6 of the project SEARs pertaining to Ecologically Sustainable Development (ESD) requires the following:

- Details of how best practice ESD principles as defined by Part 7(4) Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design and ongoing operation phases of the development.
- Details of water conservation, including practical opportunities to implement water sensitive urban design principles with particular regard to measures to prevent pollution to the neighbouring creek.
- Details of energy efficiency, including practical opportunities to minimise energy consumption from non-renewable sources and to implement effective energy efficiency measure such as passive solar design.

2.2 Clause 7(4) Schedule 2 Environmental Planning & Assessment Regulation (2000)

Clause 7(4) – Schedule 2 – Environmental Planning & Assessment Regulation (2000) identifies the Principles of ecological sustainable development as follows:

(a) the *precautionary principle*, namely, 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. In the application of the precautionary principle, public and private decisions should be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) *inter-generational equity*, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) *conservation of biological diversity and ecological integrity*, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) *improved valuation, pricing and incentive mechanisms*, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, 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.

2.3 National Construction Code (NCC) 2019 Section J

The National Construction Code (NCC)/ Building Code of Australia (BCA) 2019 includes within Section J mandatory minimum energy efficiency performance requirements for building developments (Class 3, Class 5 to 9). The objective is to reduce building greenhouse gas emissions by efficiently using operational energy. Section J is focused on establishing minimum acceptable practice in the building industry.

To meet the Performance Requirement JP1 of Section J of the BCA, compliance of the design and function of the building can be demonstrated with the Deemed-To-Satisfy (DTS) provisions of Section J Parts J1 to J8.

2.4 Coffs Harbour Sustainability Policy

Coffs Harbour City Council has committed to reducing the environmental impact from its activities. The council has created a Sustainability Policy with the following objectives:

- **Zero Carbon:** Ensure buildings and activities are energy efficient and deliver all energy with renewable technologies.
- **Reduce Waste:** Reduce waste by avoidance, reuse and recycling, maximising diversion of waste from landfill.
- **Sustainable Transport:** Reduce the need to travel and encouraging low and zero carbon modes of transport to reduce emissions.
- **Local and Sustainable Materials:** Use sustainable and healthy products, such as those with low embodied energy, locally sourced, and made from renewable or recycled resources.
- **Local and Sustainable Food:** Support sustainable and humane farming, promoting access to healthy, low impact, local, seasonal and organic diets and reducing food waste.
- **Sustainable Water:** Use water efficiently in all buildings and operations. Designing to avoid local issues such as flooding, drought and water course pollution.
- **Land Use and Biodiversity:** Protect and restore biodiversity and natural habitats through appropriate land use management and planning.
- **Culture and Community:** Respect and revive local identity, wisdom and culture; encouraging the involvement of people in shaping their community and creating a new culture of sustainability.

- **Equity and Local Economy:** Create bioregional economies that support equity and diverse local employment and international fair trade.
- **Health and Happiness:** Encourage active, sociable and meaningful lives to promote good health and wellbeing.

3 ESD Principles Meeting Clause 7(4) Schedule 2

The ESD principles that are to be incorporated into the proposed development must be aligned with Clause 7(4) – Schedule 2 – Environmental Planning & Assessment Regulation (2000).

3.1 The Precautionary Principle

The proposed development will be constructed on a previously developed site. This will not have an adverse environmental impact and therefore alleviates concern of serious or irreversible environmental damage. Proactive measures to prevent environmental degradation will be included within the design, construction and operational phases of the proposed development. During the design and construction phases the main contractor shall implement an Environmental Management System that follows NSW Environmental Management System Guidelines.

3.2 Inter-Generational Equity

To uphold inter-generational equity, the proposed development minimises the consumption of energy and water resources while reducing waste.

The ESD principles incorporated into the proposed development facilitates the conservation of energy and water resources through energy and water efficiency measures. Energy consumption will be less than a similar building as proven through exceeding NCC Section J requirements. The reduction in water use has been established through high WELS equivalent water fixtures and fittings.

Waste generated during the construction and operational phases shall be diverted from landfill to be recycled. An Environmental Management System (EMS) will be established and adhered to throughout construction. Operational waste streams will be separated to maximise recycled waste.

Reducing energy, water and waste ensures that the health, diversity and productivity of the environment is maintained for the benefit of future generations.

3.3 Conservation of Biological Diversity and Ecological Integrity

The proposed development is surrounded by urban development. The project will be constructed on a previously developed site which has a large fig tree onsite. The fig tree will remain and will be a focal point from which the building form of the development will follow. As a result, the project has no impact to the surrounding biodiversity and ecological integrity.

The project's ESD principles to reduce energy, water and waste consumption have an indirect impact to conserve biodiversity and ecological integrity to the surrounding area. By minimising demand on energy and water resources, the need for land-clearing and the pollution generated from new utility infrastructure to support the surrounding area will be minimised.

3.4 Improved Valuation

The valuation of the project's assets and services consider environmental factors through the implementation of various ESD initiatives. An Environmental Management System will be adhered to during construction to ensure that contractors are responsible for costs associated with generating excessive pollution and waste. The project team will bear the extra cost of providing recycling and landfill waste streams during construction and operational phases. This creates a system where the polluter pays and creates and incentive to reduce pollution and waste.

4 Ecologically Sustainable Design Initiatives

The following ESD initiatives provides a framework for how the future development will be designed to consider and reflect design building principles to improve environmental performance and reduce ecological impact. These initiatives will assist the development to meet its ESD planning requirements.

4.1 Building Envelope

- Thermal Performance

  The thermal performance of the building envelope will meet at minimum the requirements of the recent BCA 2019 Section J.

- Passive Solar Design:
  - The proposed façade provides vertical shading elements throughout to provide shading to visual elements and minimising solar gain. Horizontal shading devices to the north facing façade on levels 4 and 5 reduce solar heat gain from the afternoon sun
  - Building thermal mass and insulation combinations, avoiding thermal bridging
  - High performance glazed façade that balances daylight ingress and thermal performance
  - Materials selected for the façade will be part of a modular system based on panel efficiencies thus minimising waste

4.2 Electrical

ESD initiatives from Electrical Services are as follows:

- Provision of power factor correction to reduce building maximum demand and energy consumption from the grid
- Inclusion of photoelectric sensors to automatically control external lighting around the building
- Provision of energy efficient LED lighting throughout
- Use of motion sensors for back of house areas and carpark to automatically switch luminaires off after a period of inactivity
- Emergency lighting will be of a centrally monitored system with automated self-testing to minimise ongoing maintenance and costs. Individual emergency lighting will be provided with lithium battery and long-life LED luminaire
- Provision of digital power meters for lighting, power and mechanical equipment to meet NABERS requirements. All digital power meters will interface with BMCS to cater for energy consumption monitoring within the building
- Photoelectric cells to perimeter zones for daylight harvesting

4.3 Mechanical

ESD initiatives from Mechanical Services are as follows:

- High efficiency chillers
- Reverse-cycle heating
- Variable speed drives on fans and pumps, to modulate air and water flow during part load conditions
- High efficiency or EC motors
- Energy management systems integrated with a direct digitally controlled Building Management and Control System (BMCS) allowing monitoring, targeting and load management of selected plant
- Free cooling – economy cycles on all air handling units, irrespective of the cooling capacity
- Refrigerant Type
    - Zero ODP and Low GWP refrigerants shall be specified in the design
- BMCS System
    - Building Management Control System (BMCS) to schedule and optimise plant efficiency. The air-conditioning system to be designed to either shut down or be set to a wider temperature control band, when a space is unoccupied
- Heating and Cooling Systems
    - Air side systems selected to match thermal zones and individual departments, served from zoned secondary heating and cooling circuits to apportion energy use
- Heat Rejection
    - Chillers and cooling towers shall be selected to accept low entering condenser water to maximise efficiency, based on favourable wet bulb conditions
    - Hybrid towers for tenant condenser water system to reduce water consumption

4.4 Hydraulic

ESD initiatives from Hydraulic Services are as follows:

- High WELS equivalent fixtures and fitting selections
- Water metering and monitoring for each floor level, rainwater tank, mechanical plant and hot water plant
- All water sub-meters are connected to the BMCS
- Hot Water System
    - The buildings heating hot water requirements shall be met by way of a series of high-efficient gas fired boilers
- Hot Water Pipework
    - Additional insulation is provided for the domestic hot water pipework insulation to meet NCC Section J 7.2 (2019) minimum requirements.
    - The thicker insulation (38mm) will achieve a 26% reduction in energy losses when compared with the industry standard 25mm thickness.
- Water Sensitive Urban Design (WSUD)
    - Rainwater capture and reuse

4.5 Materials

- Construction and fit-out materials with low embodied energy
- Responsible building materials – best practice PVC products, steel sourced from sustainable supply chains
- Reduced indoor pollutants such as volatile organic compounds and formaldehyde emissions
- Redevelopment of previously developed urban project site will have minimised impact on the local ecology and ecosystem
- Timber to be sustainably sourced with FSC or PEFC certification
- Procurement of materials from regional suppliers to reduce travel and carbon footprint

4.6 Waste Minimisation

- Recycling and diversion from landfill of construction and demolition waste
- Recycling and diversion from landfill of operational waste

4.7 Renewable Energy

- The site will consider on-site renewable energy in the form of photovoltaics to reduce its carbon footprint. Photovoltaic modules can serve a dual purpose by shading the north-east facing sloped façade on levels 4 and 5 while producing renewable electricity

4.8 Transport

- The proposed development seeks to minimise greenhouse gas emissions produced by transport to and from the site by providing staff bicycle parking and end-of-trip facilities for cyclists

4.9 Community Engagement and Education

- Local and Sustainable Food

  The design of the building does not directly ensure local procurement and growth of sustainable food sources. However, as a community civic centre, the development provides a space to educate and promote local groups or events involved with sustainable food production

- Culture and Community

  The development will be a civic centre which provides a gathering point for the community through its café, arts gallery and library. As a local government building that aims to meet the objectives of the Coffs Harbour Sustainability Policy, it encourages other developments to incorporate sustainable design outcomes.

- Equity and Local Economy:

  The construction of the building provides employment opportunities to local trades, consultants and contractors who support local businesses. When in operation, building occupants will continue to support local businesses.

- Health and Happiness

  The proposed building design and services deliver comfort to occupants while minimising energy and potable water consumption. The use of low VOC and formaldehyde emitting materials ensures that sick building syndrome is minimised for the benefit of occupancy health.