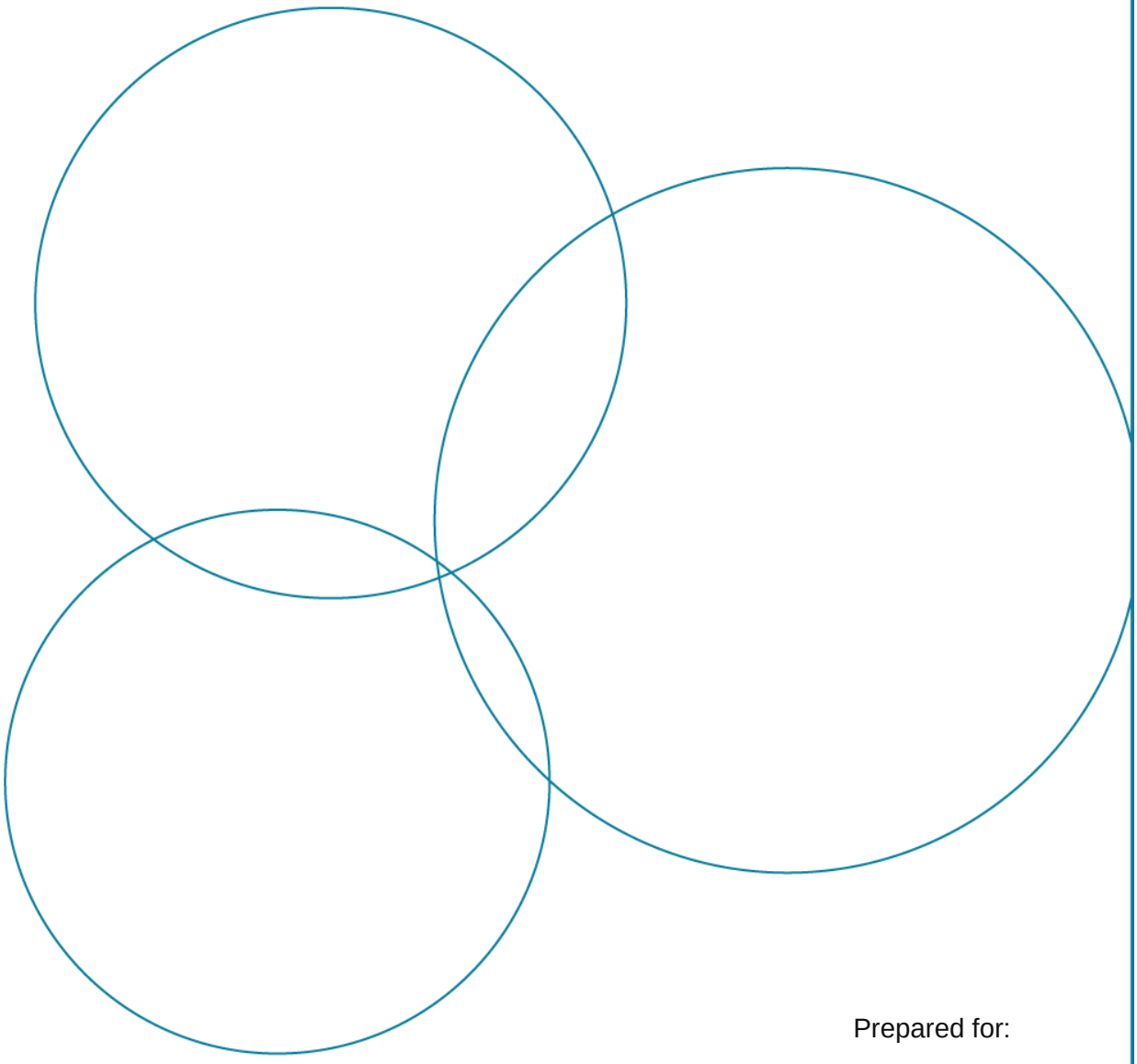
24 April 2018

Sustainable Design Report

Building Renewal Projects – Concert Hall and Creative Learning Centre (SSD 8663)



Prepared for:

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The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.

Contents

1 Introduction

1.1 Purpose

This ecologically sustainable design (ESD) report supports a State Significant Development (SSD) application for Concert Hall and Creative Learning Centre projects. The SSD application number is 8663 and the applicant is the Sydney Opera House Trust.

This report is prepared to address the secretary's environmental assessment requirements (SEARs) ESD requirements listed in Table 1 below:

SEARs (SSD 8663) Clauses	SEARs ESD Related Requirement
SEARs Schedule 2 General Requirements	Measures to avoid, minimise and if necessary, offset the predicted impacts and detailed contingency plans for managing significant risks to the environment.
SEARs Schedule 2 Key Issue 4 Heritage	The Heritage Impact Statement (HIS) must provide a detailed assessment of each of the key proposed elements, and implications of BCA compliance and construction issues. The HIS must demonstrate that the proposed works present the best options with the least heritage impacts.
SEARs Schedule 2 Key Issue 9 Construction Impacts	Identify the noise, air quality, water quality (including groundwater impacts from any excavation), contamination, waste management and traffic impacts associated with the construction of the proposal.
SEARs Schedule 2 Key Issue 10 Waste Management	Outline how the development addresses the relevant provisions of the City of Sydney Code for Waste Minimisation in New Developments 2005. Include a Hazardous Materials Survey prepared in accordance with the relevant Australian Standards.
SEARs Schedule 2 Key Issue 11 ESD	Identify how development will incorporate ESD principles in the design construction and operation phases of the development.

Table 1 SSD 8663 SEARs ESD Requirements

2 Sustainable Design Strategy

2.1 Opera House Commitment and Design Objectives

The Opera House Environmental Sustainability Plan (ESP) 2017-2019 sets out ambitious targets to be achieved by 2023. The plan provides an achievable roadmap towards the 2023 sustainability targets to embed environmental sustainability in twelve key focus areas:

- Energy
- Water
- Materials and procurement
- Waste
- Climate change
- Transport
- Nature
- People
- Risk management
- Stakeholder involvement
- Ecologically sustainable business practices
- Education and awareness for audience and visitors.

The key relevant targets are summarised below:

- 20% energy savings by 2023
- 7% reduction in carbon footprint by 2019
- Water efficiency ratings for all fitouts equal to or better than NSW Government Resource Efficiency Policy requirements
- 80% construction waste reduction
- All stages of the Building Renewal projects demonstrate industry best practice in environmental sustainability.

2.2 Design Response to SEARs

Cundall is the ESD consultant appointed for the Building Renewal Projects and previously developed a project specific Building Renewal Sustainability Plan (BRSP) to ensure Sydney Opera House sustainability principles were applied in each of the building renewal projects. The BRSP provides a framework for reporting sustainability initiatives at key project milestones throughout design and construction stages.

The following key sustainability principles have been considered throughout the Concept and Schematic Design stage:

- Minimise greenhouse gas emissions and provide low carbon energy sources
- Improve indoor environment quality (IEQ)
- Reduce environmental impact by sourcing sustainable building materials
- Promote environmental risk management
- Reduce demolition and construction waste from site activities
- Responsibly manage and dispose of hazardous materials
- Reduce potable water consumption
- Protect culture and heritage.

Cundall has reviewed the relevant documents prepared by the project team and summarised the project ESD design responses in the following sections.

2.2.1 Minimise Greenhouse Gas Emissions

The SOH ESP includes an energy efficiency target of 20% energy saving by 2023, and Renewal Projects will aim to support this target through the renewal upgrades. This project will incorporate the following initiatives to minimise greenhouse gas emissions:

- Upgrade existing or install new energy efficient LED light fittings
- Install lighting control systems to reduce energy consumption
- Select fans with variable speed drives (VSD) motors to reduce fan energy consumption
- Connect to upgraded building control management system (BCMS) to control HVAC systems efficiently
- Connect heating and cooling equipment to the Sydney Opera House central plant system which is being renewed in 2017 to improve energy efficiency.

2.2.2 Improve Indoor Environment Quality (IEQ)

The project aims to achieve industry best practice in IEQ in line with Green Star Performance criteria for indoor air quality, internal noise levels, thermal and lighting comfort.

2.2.3 Sourcing Sustainable Building Materials

The project will select CFC free polyurethane insulation and low PVC insulation for cabling and conduits.

The project team will consider the sourcing and forest certification schemes of timbers used for the Renewal Projects.

2.2.4 Promote Environmental Management

The Contractor will be required to have an Environmental Management System (EMS) certified in accordance with the NSW Government EMS standard (i.e. documented in conformance with AS/NZS 14001:2004).

A detailed and project specific Environmental Management Plan (EMP) will be developed by the Contractor engaged to undertake the project.

The project aims to demonstrate best practice environmental risk management in contracts and implementation.

2.2.5 Reduce Demolition & Construction Waste

The project team will work towards a fully integrated demolition waste management strategy and target to achieve a minimum 80% diversion from landfill for all waste resulting from the project works in construction.

The project will undertake an audit of existing materials and identify which materials can be reused or recycled. The project team will work towards reuse of existing building materials or services whenever possible to reduce the volume of demolition waste.

A detailed Waste Management Plan will be developed by the Contractor engaged to undertake the project. The plan will be prepared in accordance with relevant NSW legislation and the principles of the waste management hierarchy as set out in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

2.2.6 Hazardous Materials Management

The project will implement the Sydney Opera House Asbestos Risk Management Plan (Hibbs & Associates Pty Ltd 2013) and the Sydney Opera House Hazardous Materials Action Plan (2015) for management and disposal of hazardous materials. Sydney Opera House will maintain a Hazardous Materials Register which documents all asbestos contaminated materials (ACM), hexavalent chromium and lead paints within the building.

Removal and disposal of any hazardous materials will comply with all relevant laws, regulations and guidelines including, but not limited to, Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014 and Protection of the Environment Operations (Illegal Waste Disposal) Act 2013.

2.2.7 Reduce Potable Water Consumption

Water efficiency ratings will be specified for all fixtures and fittings equal to or better than NSW Government Resource Efficiency Policy requirements in line with the SOH ESP.

2.2.8 Protect Culture and Heritage

All proposed design initiatives will consider the impact of all works in respect of the Utzon Design Principles and Sydney Opera House's Conservation Management Plan.

3 Conclusion

The ESD initiatives outlined in this report demonstrate that the proposed works have complied with the ESD related SEARS requirements:

1. Reducing greenhouse gas emissions
2. Water conservation
3. Improving indoor environment quality
4. Sustainable procurement of materials
5. Environmental management
6. Hazardous materials management
7. Waste minimisation
8. Protecting culture and heritage.