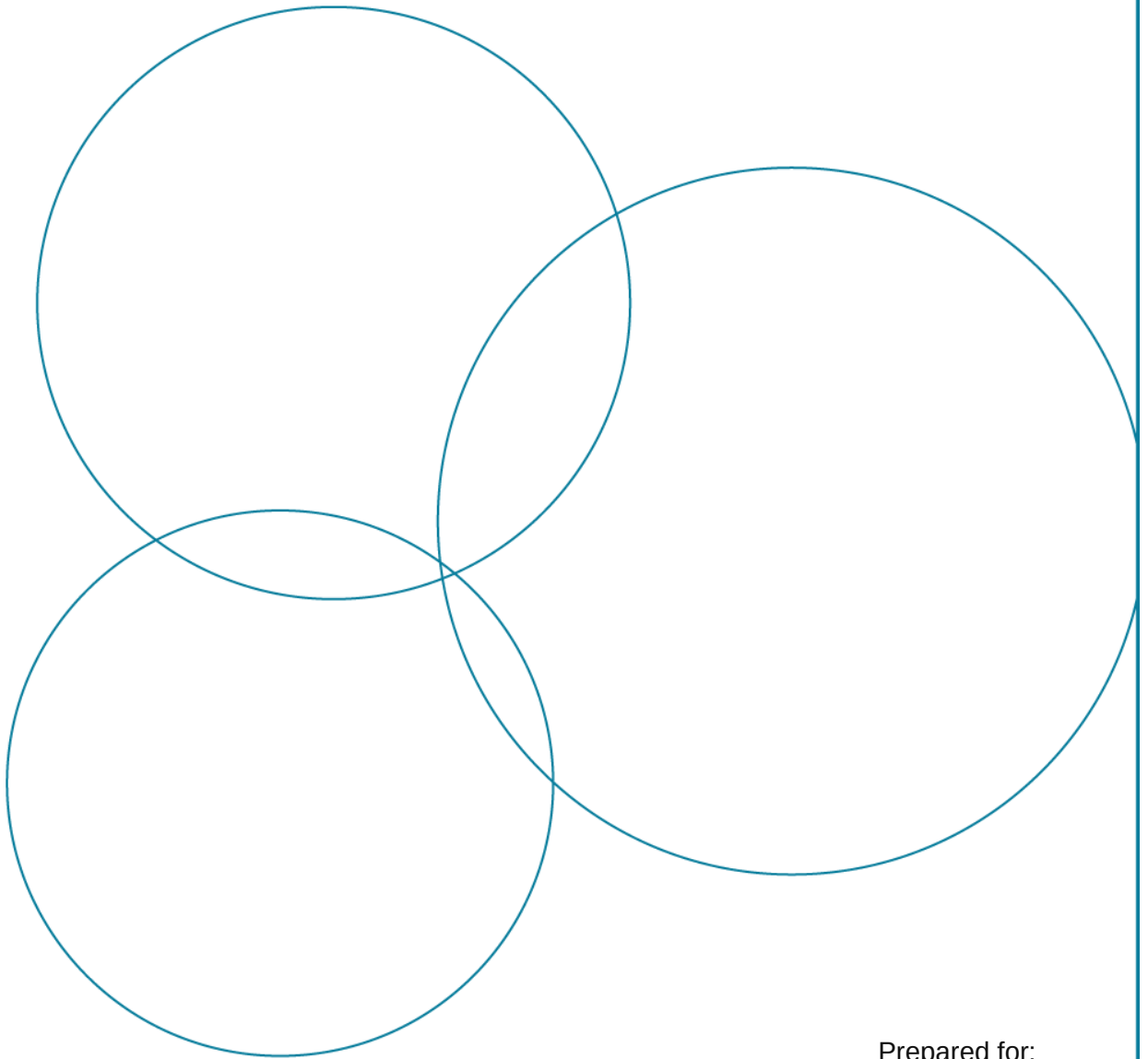


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22 August 2016

Sustainable Design Report

Building Renewal Projects - Stage 1 (SSD 7665)

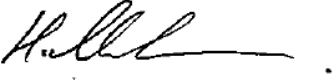


Prepared for:

Sydney Opera House

By Cundall
Level 1, 48 Alfred Street
Milsons Point, NSW 2061
Ph (02) 8424 7000
Fax (02) 8424 7099

Please contact: Hannah Morton

Author:	Iris Chan	
Checked by:	Hannah Morton	
Approved by:	Hannah Morton	
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-	First issue for Review	18/07/2016
A	Revised as per DA 2 scope of works (Rev 4 breakdown).	5/07/2016
B	Revised as per comments by Sydney Opera House.	22/08/2016
C	Revised as per comments by Sydney Opera House.	22/08/2016
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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.		

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1 Introduction

1.1 Purpose

This ecologically sustainable design (ESD) report supports a State Significant Development (SSD) application for Joan Sutherland Theatre (JST) Front of House and Accessibility and Additional works. The SSD application number is 7665 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.

Table 1 SSD 7665 SEARs ESD Requirements

SEARs (SSD 7665) Clauses	SEARs ESD Related Requirement
SEARs Schedule 2 General Requirements	Measures to avoid, minimise and if necessary, offsets the predicted impacts and detailed contingency plans for managing significant risks to the environment
SEARs Schedule 2 Key Issue 8 ESD	Identify how development will incorporate ESD principles in the design construction and operation phases of the development.
City of Sydney Consultation Letter (31/5/16) Waste Management	Applicant must address the relevant provisions of the City of Sydney Code for Waste Minimisation on New Development 2005 and include a Waste Management Plan consistent with Section 3.14 of SDCP 2012.
EPA Consultation Letter (1/6/16) Environmental	Handling, transport and disposal of any asbestos that may be encountered during the project
EPA Consultation Letter (1/6/16) Environmental	Opportunities to minimise consumption of energy generated from non-renewable sources and to implement effective energy efficiency measures.

1.2 Sydney Opera House Building Renewal Plan Background

In 2015 the Sydney Opera House began the Building Renewal Plan works to transform its visitors' experience, improve the arts spaces and upgrade the main infrastructure. The renewal plan includes twenty seven projects, six building studies and four visitor focused integration strategies. The Building Renewal Plan defined the concept, scope of works and priority of multiple projects during the next ten years. Projects are allocated over three stages of three years each.

The key projects of the first renewal stage are summarised in Table 2.

Table 2 Sydney Opera House Building Renewal Projects – Stage 1 Key Projects

Building Renewal Plan Stage	Period	Building Renewal Plan Scope of Works Summary	Key Projects
Stage 1	2015-2017	Sixteen building projects Two building studies Four enabling projects	Concert Hall Upgrade New Function Centre New Creative Learning Centre Upgrade Entry & Foyer Performing Arts Practice Support spaces

1.3 Scope of Works

The scope of works for this DA submission is summarised below:

Table 3 Summary of Key Projects for DA

Works Area	Summary of Key Projects	Leading Designer (if known)
Accessibility projects	- New lift 31 - Upgrade lift core 8 - Upgrade northern foyer access - Upgrade JST dressing room - Upgrade orchestra pit access - Upgrade east and west toilets - Upgrade auditorium seating	Scott Carver
Eastern Accommodation	Relocation of existing Theatre & events office. Require new lift stop, new interior finishes and services.	Tonkin Zulaikha Greer Architects
Entry foyer	- Upgrade the traditional box office - New escalator from Vehicle Concourse to the Entry Foyer - New toilets - New retail shops - New Utzon lounge and bar - New cloakroom store - New retail display wall and LED screen - Upgrade existing green kitchen to suit new bar	Tonkin Zulaikha Greer Architects
Followspot room	New room to provide access to the back of stage.	-
Seat refurbishment	Refurbish or renew the auditorium seating to provide improved fire rating of the seats.	-

2 Sustainable Design Strategy

2.1 Opera House Commitment

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 practice(s)
- Education and awareness for audience and visitors.

The key relevant targets are summarised below::

- 20% energy saving by 2023.
- 7% reduction in carbon footprint by 2019.
- Water efficiency ratings for all fitouts equal or above NSW Government Resource Efficiency Policy.
- 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 Renewable 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 the design and construction.

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

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

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

2.2.1 Minimise Greenhouse Gas Emissions

The project will incorporate the ESD initiatives to minimise greenhouse gas emissions, including:

- Upgrade existing or install new energy efficient LED light fittings.
- Install flexible lighting control system to reduce consumption and enhance flexibility.
- Select fans with variable speed drives (VSD) motors.
- Install lift lighting control.
- 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.

2.2.2 Improve Indoor Environment Quality (IEQ)

The project aims to achieve an industry best practice in IEQ in line with GBCA Performance criteria, including 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 to reduce the environmental impact of the projects.

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.

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

2.2.5 Reduce Demolition Waste

The project team will work towards a fully integrated demolition waste management strategy and target to achieve 80% diversion from landfill for all waste resulting from the project works in construction. This is considered a best practice target for recycling in the construction industry.

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 for all fitouts equal or above NSW Government Resource Efficiency Policy in line with the SOH ESP.

2.2.8 Protect Culture and Heritage

All proposed design initiatives must consider the impact of all works in respect of the Utzon Design Principles and Conservation Management Plan.