Wanda One Sydney Pty Ltd

Wanda One Sydney – Tower B

ESD Report

DA Submission | 31 October 2016

Job number 247747-00

Arup
Arup Pty Ltd ABN 18 000 966 165

Arup
Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia
www.arup.com

ARUP

Document Verification

ARUP

Job title		Wanda One Sydney – Tower B			**Job number** 247747-00
Document title		ESD Report			**File reference**
Document ref					
Revision	**Date**	**Filename**			
Draft 1	28th Sept 2016	**Description**	First draft		
			Prepared by	Checked by	Approved by
		Name	Eve Hoskins	Tim Elgood	Tim Elgood
		Signature			
Submission	31 Oct 2016	**Filename**			
		Description			
			Prepared by	Checked by	Approved by
		Name	Eve Hoskins	Tim Elgood	Tim Elgood
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
				Issue Document Verification with Document	✓

Contents

Executive Summary

This report summarises the sustainability strategy for the proposed Tower B at the Wanda One, Sydney development. This project specific ecological sustainable development (ESD) report includes sustainability initiatives which demonstrate a performance in excess of the minimum code requirements. The following key performance indicators, which provide environmentally sustainable benefits, are based on achieving the equivalent performance of a 5 star Green Star development. To achieve this outcome the following strategies are proposed:

1. **Management**

   - Implementing a high level of commissioning and tuning of building services throughout the operational phase of the project.
   - Encouraging very high levels of environmental management practices during construction and demolition.
   - Incorporating a best practice waste management system.
   - Using smart metering and monitoring of energy, water, waste and indoor environment quality.

2. **Indoor environment quality**

   - Incorporating operable windows to the Hotel rooms connected to the BMS system to provide the occupants with the choice of natural ventilation or air conditioning.
   - Designing an energy efficient air condition system with ducted fresh air.

     High efficiency low e double glazing with high thermal performance and daylight transmission.
   - Maximising the amount of daylight to the building and encouraging the natural views of the harbour and city.
   - Increasing thermal comfort of occupants through a high performing façade and passive design.

3. **Energy**

   - Incorporating a breathable façade with automated windows for natural ventilation.
   - Rooms have excellent winter solar access for passive heating.
   - Installing energy efficient appliances
   - Automating the lighting and air conditioning controls based on occupancy sensors to reduce energy usage.
   - Installing regenerative lifts to convert the excess energy generated by a lift into electricity that can be reused elsewhere in the building.

- Assessment of the lifecycle benefits of installing micro cogeneration for domestic hot water and low carbon power generation.
- Energy efficient centralised chilled water and heating used throughout.

4. Transport

- Allowing 10% of parking provision to be for electric vehicles with charging infrastructure provided for each space.
- Installing bicycle parking and *end of trip* facilities provided for hotel and retail workers.

5. Water

- Installing water efficient tap ware and WC's.
- Metering and monitoring major water uses.
- Assessment of the feasibility to connect to the George Street recycled water.main in the future.

6. Materials

- Good management of sustainable materials during construction.
- Utilising Low VOC and formaldehyde materials.
- Good management of construction waste.
- Use of FSC timbers.

7. Land use and ecology

- Design to include vertical gardens with native and low irrigation plant sections

8. Emissions

- Minimising light pollution to neighbouring and the night sky.
- Selecting low impact refrigerants.

9. Innovation

- Efficient energy use throughout construction with a system in place for continued contractor education and encouragement of sub contractor feedback on sustainability improvements.
- Annual monitoring of air quality.

1 Introduction

This report presents the sustainability strategies for the proposed Tower B at the Wanda One Sydney development. The overall objective is to achieve the equivalent of a 5 star Green Star rating.

The design of Tower B, Wanda One Sydney includes a high performing operable façade, efficient and automated systems and best practice management techniques. The façade design of Tower B Wanda One Sydney includes a considered approach to minimise the energy consumption of the air conditioning system. This is implemented through the operability of windows in a high performing façade to provide natural ventilation and good solar access, alleviating air conditioning use. Reducing Co2 emissions through this arrangement is in line with the principles of the City of Sydney' Net Zero Energy Target for 2050.

This report includes key commitments to the environmental performance of the building and a methodology for how these commitments can be monitored and achieved throughout the design, construction and operation of the proposed development.

1.1 Proposed sustainability strategy

The strategy is developed on the basis of a achieving an equivalent of a 5 Star Green. This site specific strategy will ensure the sustainability targets are achieved throughout the design, construction and operational phases of the project. The following key sustainability performance indicators have been used for the framework:

1. Management;
2. Indoor Environment Quality;
3. Energy;
4. Transport;
5. Water;
6. Materials;
7. Land Use and Ecology;
8. Emissions;
9. Innovation.

2 Sustainability performance

This section of the report outlines the sustainability performance proposed for the project, with key performance indicators.

2.1 Management

The following management strategies being considered for the design and construction of Wanda One Sydney, aim to improve the projects sustainability by influencing areas where decision making is critical:

1. The building will provide a high level of commissioning and tuning upon completion to ensure the building services operate efficiently and to their full potential.
2. Consideration will be taken into extending the life of the interior fit out and finishes of the building.
3. The building will have accessible smart metering and monitoring to all major energy and water sources and uses. This metering will be capable of producing reports on the consumption and demand of energy and water for the base building systems.
4. Building environmental performance targets will be set and measured for energy, water, and waste and indoor environment quality.
5. A best practice formal environmental management will be implemented for procedures during construction of the building.
6. The project will implement best practice waste management system allocating areas, size and collection strategies. This will include the collection and separation of distinct waste streams.
7. An assessment will be carried out of the alterative waste strategies and working with an appropriate waste operator to determine the feasibility of high technology off site waste recycling.

2.2 Indoor environment quality

The following indoor environment quality strategies have been proposed to achieve sustainability performance in a manner that also improves the occupant experience of the space:

1. The building is being designed with a breathable façade, providing operable windows for occupants. This will also allow personalised comfort for the occupants of the building. Natural ventilation is not very common in Australia for hotels so Wanda One Sydney will provide leadership in this field.
2. The air conditioning system is designed with ducted fresh air which will exceed Australian Standards.

3. The acoustic insulation of the building is designed in excess to Australian standards to provide appropriate and comfortable acoustic conditions for occupants.
4. Efficient flicker free lighting will be including in the building.
5. The lighting levels and glare reduction will comply with best practice guidelines.
6. The design maximises the accessibility to high quality external views to the harbour and city.
7. The design maximises the amount of natural daylight to the building. This provides passive solar heating during winter and increases the solar access to occupants.
8. The building design will promote a high level of thermal comfort for occupants through the use of a high performing façade and passive design.

2.3 Energy

The following initiatives will be included in the building to reduce to overall operational energy consumption below that of a comparable standard practice building.

1. The façade of the building has been designed to allow natural ventilation through the design of operable windows to the hotel rooms. This façade system will be controlled by the BMS which will help reduce the energy consumption of the air conditioning system.
2. The façade has been designed to provide good access to winter sun and daylight within the building.
3. The facade will include a high performing double glazed unit to minimise the heating and cooling loads.
4. The insulation of the building will be in excess of deemed to satisfy requirement helping to reduce the air conditioning loads.
5. Energy efficient appliances will be provided throughout the building.
6. The air conditioning systems of rooms will be connected to the BMS system based on occupancy to reduce the use of the system to unoccupied spaces.
7. The design will also integrate automation of controls to ensure that lighting is switched off when there is no activity in the space
8. Regenerative lifts, which are a more energy efficient system then most standard practice lift systems, will be installed in the project
9. Energy efficient centralised chilled water and heating used throughout.
10. Assessment of the lifecycle benefits of installing micro cogeneration for domestic hot water and low carbon power generation.

11. The vertical gardens to the lower levels will contribute to reducing ground and air temperatures especially during the warmer months to adjacent spaces.

2.4 Transport

The following transport strategies are aimed at minimising dependency on occupants using a private car to reduce overall greenhouse gas emissions.

1. The building is located in area which has readily accessible transport options and which are in a close proximity to a range of amenities, reducing the need to use private cars.
2. The building will include at least 10% parking provision to be for electric vehicles with charging infrastructure provided for each space.
3. Bicycle parking and *end of trip facilities* will be provided for hotel and retail workers.

2.5 Water

The following water conservation strategies have been proposed for the development:

1. Water efficient tap ware and WC's will be included throughout the building
2. Water metering will be included of all main base building water supplies i.e. domestic hot water top up, laundry and irrigation.
3. Low irrigation requirement landscape will be selected

2.6 Materials

The following material selections will be considered to address the consumption of resources within the construction of the building:

1. Minimisation of PVC throughout building services.
2. The use of sustainable timber (FSC timber products) is being considered.
3. Reduction in the concrete mixes is being considered.
4. Post-consumer recycled content structural steelwork, reinforcement bars and mesh is being considered.
5. Low VOC materials will be used for flooring, paint, adhesives and sealants.
6. Low formaldehyde emission engineered woods produces will be used throughout.
7. All thermal insulants will be selected to avoid the use of ozone depleting substances in both there manufacture and composition.

8. The building will aim to reduce to construction waste going to landfill by reducing or recycling building materials. Waste management during construction will ensure a 80% recycling rate during demolition and construction.

2.7 Land Use and Ecology

The following techniques to increase the ecological value of the site are being implemented:

1. The design includes an increase in ecological value from the existing site area through the increase in vegetation. The vertical gardens provides a greener aspect to the ground plane to create a more inviting and biophillic experience.
2. Native and low irrigation landscape will be preferred in the selection of plants.

2.8 Emissions

The following strategies are being considered to reduce the environmental impacts of common building emissions;

1. Light pollution to neighbouring and the night sky will be minimised through strategic lighting design.
2. Environmental impacts of refrigerants will be minimised through selection of low impact refrigerants.

2.9 Innovation

Tower B, Wanda One Sydney will provide leadership in sustainability in the following areas:

1. Minimisation of energy usage throughout construction will be encouraged through monitoring and education. Education on key concepts of global warming, climate change and site specific sustainability objectives and strategies will be provided to 80% of contractors. In addition, a high performance site shed will be provided for construction.
2. Air quality will be metered and monitored within the hotel rooms. This will include an annual indoor air quality testing. The monitoring will be produced in the form of occupant surveys to determine satisfaction of indoor air quality.

3 Conclusion

Tower B, Wanda One Sydney has established a sustainability strategy that achieves a performance well in excess of minimum requirement. The implementation of a high performing operable façade, efficient and automated systems and management techniques which are highlighted in this strategy will would provide a building which is above standard environmental sustainability practice.