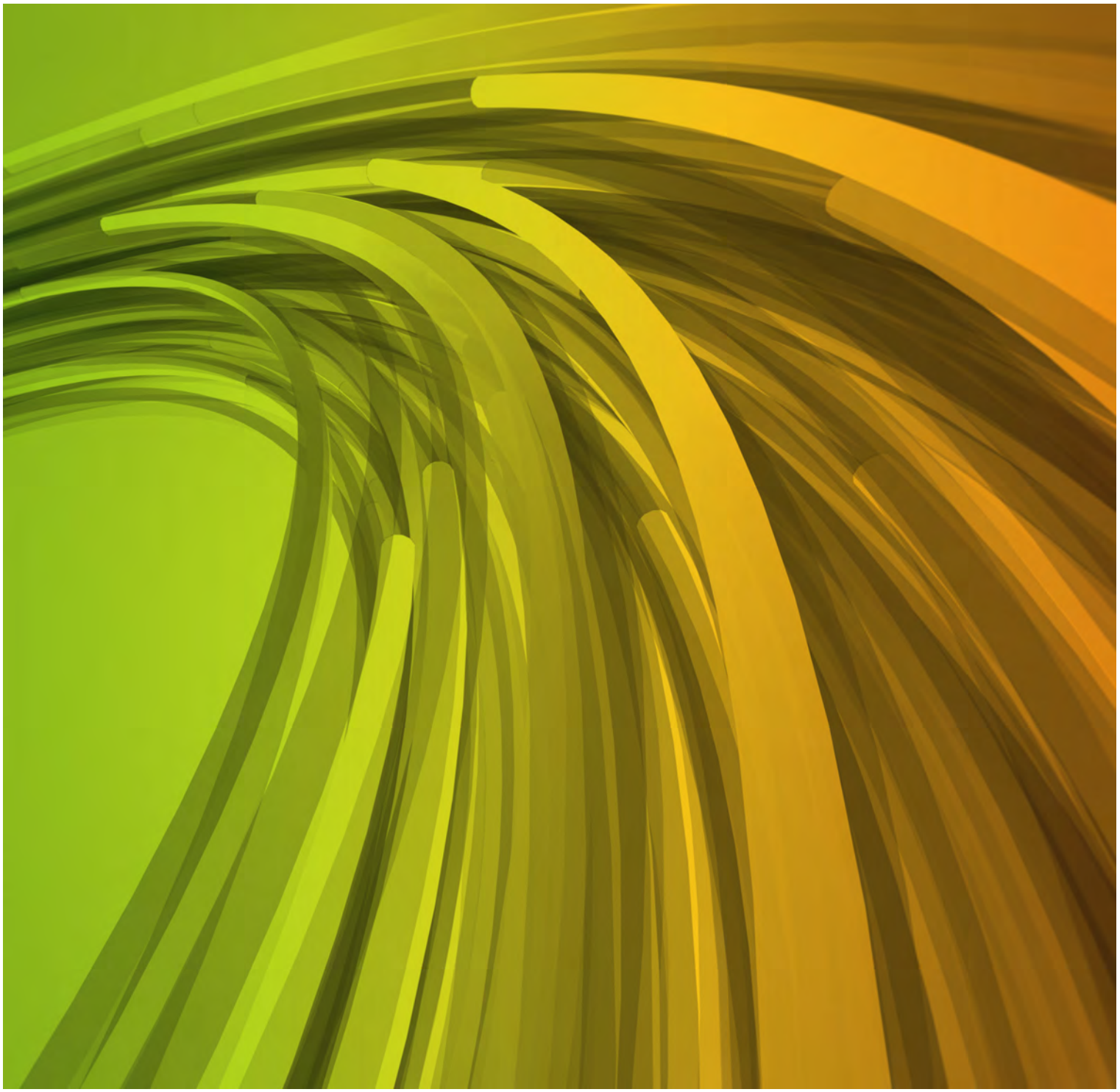
Jones Bay Wharf

Marina Expansion

12 August 2010

Jones Bay Wharf
ESD Strategies Report



ESD Strategies Report

Jones Bay Wharf Marina Expansion

Prepared for

Peloton Development Management Pty Ltd

Prepared by

AECOM Australia Pty Ltd
Level 11, 44 Market Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8295 3600 F +61 2 9262 5060 www.aecom.com
ABN 20 093 846 925

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Quality Information

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1.0 Introduction

This Environmental Sustainable Design (ESD) Strategies Report summarises the sustainable design options considered for the design and management of the proposed Jones Bay Wharf Marina Expansion, Pyrmont.

Jones Bay Wharf consists of wharves 19, 20 & 21 at 19-21 Pirrama Road Pyrmont. The proposed works will expand the capacity of the marina to accommodate up to a total of 73 commercial vessels and some limited public day berthing at the Southern end of the wharf.

This ESD Strategies Report considers the environmental impacts, sustainability and/or efficiency of the proposed:

- Materials selection, including 'carbon impact' analysis of the major materials
- Hydraulic design and operations
- Lighting design and operations
- Mechanical equipment and operations
- Urban Design and Public access
- Potential renewable energy technology

This ESD Strategies Report is to be read in conjunction with the Environmental Assessment prepared by RPS.

2.0 Sustainable Design Strategies

2.1 Materials Selection

A comparison of the embodied energy of various materials is provided within this section, which indicates the benefits of using alternate materials, for example, those with some recycled content. A comparison of the carbon dioxide equivalent (CO_2e) of 1kg of hardstand material is presented below. As indicated, replacement of concrete mix with flyash reduces the CO_2e by approximately 16%. Materials with lower embodied carbon content may be considered during the design and construction.

If structurally viable, concrete and flyash mix would be considered for concrete materials. The structural engineers will confirm whether the required strength may be met for extensive vehicle movement and parking through the use of a flyash mix during design development.

Unit	Material	Kg CO_2e
1kg	Concrete plain mix	0.25kg CO_2e
1kg	Concrete 30% flyash	0.21kg CO_2e

Building materials will inevitably contribute to a significant portion of the development's embodied energy. The CO_2e presented below for a range of common building materials, indicates a significant variation between products. It is recognised that steel fixtures such as handrails and balustrades will be required for durability reasons. Reinforcing steel required for the structural concrete may also consider the use of recycled steel which has a lower embodied energy. Generally, the selection of materials, coatings and fixings should consider the whole of life maintenance and longevity within the marine environment.

Unit	Material	Kg CO_2e
1kg	Aluminium, building applications	18.6
1kg	Steel, Bluescope Port Kembla	3.11
1kg	Steel, Bluescope Port Kembla – 20% recycled	2.80
1kg	Hardwood	0.45
1kg	Structural Pine	0.39

Where the opportunity exists, consideration would be given to materials which have a lower embodied energy.

2.2 Construction & Manufacturing Practices

Bellingham Marine is proposed to undertake the pontoon manufacturing and installation including, concrete decking, timber decking, aluminium handrails and float units. The amount of embodied CO_2e within the materials can be reduced by selecting suitable materials with a low embodied CO_2e, or with recycled content as per the table above.

Bellingham Marine has purchased carbon offsets accredited under the Voluntary Carbon Standard to offset all greenhouse emissions produced from the manufacturing and construction operations of Bellingham Marine. Bellingham Marine has been accredited by the Carbon Reduction Institute as follows:

- Bellingham Marine Australia is certified LowC02 100%
  LowC02 CERTIFICATION #LC077 (See Appendix)

The float units specified by Bellingham Marine are constructed with Expanded Polystyrene. Where possible Class S Expanded Polystyrene should be selected which may contain up to 10% maximum of reclaimed material.

The pontoon installation and delivery is proposed to be undertaken via a floating barge. This will reduce the amount of road traffic disruption, vehicle noise and pollution associated with the development.

The Concrete Pontoon Piles are proposed to be supplied by Rocla PTY Limited. These piles do not require an exterior coating and have a lifespan of 20 years.

2.3 Hydraulic Services

The proposed marina expansion will require additional water outlets for potable water use and for vessel wash down. Additional vacuum sewer line facilities will also be provided.

2.3.1 Design selection

The environmentally sustainable hydraulic design considerations include:

- Individual water metering integrated into the proprietary 'Pedestal' service outlet at each berth to allow water monitoring and management
- High-density polyethylene piping that avoids the use of PVC for sewer and water services
- Sewer vacuum created by a 3HP energy efficient sewer vacuum pump with inbuilt automatic vacuum level sensor. The sensor ensures the pump only operates when vacuum levels drop therefore reducing the unnecessary energy use.

Due to the high use of potable water for 'wash down' of vessels and hardstand areas, the Marina would benefit from the capture and reuse of recycled rainwater on the site. Future stages of development at Jones Bay Wharf may consider the collection of rainwater and roof water from the adjacent buildings and collection in an on-site detention tank. Note, the collection of surface water from the carpark and roads should be avoided as this may contain petroleum and is not be suitable for re-use on hardstand or landscaped areas.

Where possible, the collection of rainwater and roof water may be connected to the WC's within the Wharf buildings for flushing.

2.3.2 Operation and management

The Jones Bay Wharf Marine Operational Management Plan prepared by Scope Marine, proposes the following sustainable practices:

- Marina tenants must use biodegradable detergents for wash down procedures
- Only trained marina staff will operate the sewer pump-out facility
- All marina staff will under-go specific training in the use and deployment of floating booms and provided spill kits
- Any spills, leaks or sighted waterway contamination will be reported to marina management

2.4 Lighting

Sustainable lighting design ultimately aims to improve the efficiency of artificial lighting. Consideration of strategies such as occupant sensing and day-night use modes to control the lighting would also yield energy savings. Notwithstanding the requirement for fulltime security and access lighting, incorporation of strategies such as motion sensing or light dimming has the potential for overall energy savings.

2.4.1 Design selection

Sufficient lighting fixtures will be required along the proposed pontoon extension to provide adequate lighting. It is proposed that the pontoon access lighting will be integrated into a proprietary 'Pedestal' service outlet at each berth.

Pedestal lighting environmentally sustainable considerations include:

- Sensors and/or timers to control the lighting
- Maximum fixture spacing as required to produce sufficient lighting
- Light diffusers and glare shields to minimise light spill outside the required illumination areas.
- Materials and fixture colours consistent with the surrounding environment materials
- Ability to turn off the lighting to berthing areas not in use
- Integrated photovoltaic panel power generation
- Each Pedestal uses a single 4 watt LED for lighting
- Each LED uses 0.016 amp. And provides up to 50,000hrs of light or 10hrs/night for 12 years
- Each LED saves approximately $20/yr in energy consumption compared to a compact fluorescent globe

2.4.2 Operation and management

The Jones Bay Wharf Marine Operational Management Plan prepared by Scope Marine, proposes the following sustainable practices:

- Lights on all pontoons will be activated by a timer system
- Pontoon lighting will have light 'spill' covers
- Lighting for access gates will be site specific and movement sensor activated
- All lighting except for pontoon, access and navigational lights will be turned off outside normal operating hours.

2.5 Pedestrian comfort and landscaping

With the exception of the proposed boardwalk linking Jones Bay Wharf and Darling Island, the existing Jones Bay Wharf urban design and pedestrian access will remain in its current form.

2.5.1 Jones Bay Wharf – Darling Island Boardwalk

The proposed boardwalk linking Jones Bay Wharf and Darling Island will complete a continuous foreshore walkway from Jones Bay Wharf to Darling Island. Aspects of sustainable design that can be considered for the Jones Bay Wharf to Darling Island Boardwalk include:

Sustainable material selection

- Consider materials with a high recycled content
- Minimise embodied energy of materials
- Select materials with low transportation energy use
- Consider end of life reuse opportunities
- Assess whole of life maintenance and replacement impacts
- Select energy efficient lighting

Pedestrian access/comfort

- Provision for disabled access
- Seating and shading opportunities
- Pedestrian lighting

2.6 Potential integration of renewable energy technologies

2.6.1 Design opportunities

Opportunities for solar collectors exist on site to reduce the reliance on electricity and provide power for site lighting, vessel auxiliary connections and possibly feed back into the grid. The existing Wharf buildings and structures provide relatively unobstructed access to sunlight. The rooftop collectors would need to be located on the inner side of the roof apex due to visual and heritage restrictions. On a small scale, integrated photovoltaics within the service 'pedestal' are proposed to generate power for the Pontoon access lighting.

The typical rule of thumb for a solar array in order to achieve optimum performance is:

- The surface should be orientated somewhere between north west and north east.
- The surface is typically tilted between 23 degrees to 30 degrees from the horizontal to achieve optimum performance.

3.0 Conclusion

The strategies summarised above include a combination of initiatives which are based on improving the sustainable design options of the proposed development, including energy and water consumption. It is considered the above mentioned factors provide an appropriate range of sustainability strategies at both the built and operational level.

When considered in the overall site design, the presented options should allow for maximisation of the site features and opportunities for sustainability.

4.0 Appendix

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CARBON REDUCTION CERTIFICATE

Date:
12th August 2010

This is to certify that all greenhouse gas emissions produced from the operations of **Bellingham Marine Australia** have been calculated by the Carbon Reduction Institute.

Bellingham Marine Australia has purchased carbon offsets accredited under the Voluntary Carbon Standard to offset these emissions.

Bellingham Marine Australia is certified LowCO2 100%.
Certified Since: 09/07/2008.
LowCO2 CERTIFICATION #LC077

Faithfully Yours,

Rob Cawthorne
Managing Director

CERTIFICATION #LC077
LOW CO2
WWW.NOCO2.COM.AU

CERTIFICATION #LC077
LOW CARBON MARINA INITIATIVE
WWW.NOCO2.COM.AU

CARBON REDUCTION INSTITUTE
WWW.NOCO2.COM.AU

CARBON REDUCTION INSTITUTE

Carbon Reduction Institute Pty Ltd 13, 38-46 Albany Street - St Leonards – NSW - 2065
P: +61 2 9439 9990 - F: +61 2 9439 5550 - W: www.noco2.com.au ABN 26 122 969 233