McMahons Point Wharf Interchange
Review of environmental factors
January 2016
Title: McMahons Point Wharf interchange

Approval and authorisation

Accepted on behalf of Roads and Maritime Services NSW by:

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© Roads and Maritime Services NSW
Executive summary

The proposal

Roads and Maritime Services (Roads and Maritime) proposes to redevelop the McMahons Point Wharf Interchange (refer Figure 3-1), referred to throughout this Review of Environmental Factors (REF) as the proposal.

The proposal would include:

- Removal of existing McMahons Point Wharf
- Construction of new McMahons Point Wharf interchange comprising of:
  - A covered shelter
  - An uncovered bridge and gangway
  - An uncovered dual berth pontoon
- Landside upgrade works
  - Realignment of the kerb and gutter adjacent to Sails on Lavender Bay restaurant
  - Realignment of the kerb and gutter at the turning circle at Henry Lawson Avenue.

The new waiting shelter would be constructed in generally the same position as the existing waiting shelter.

The proposed bridge, gangway and pontoon would be located further into the harbour and further to the south east, of the existing wharf. These elements would not have a canopy.

Landside infrastructure would include the realignment of some of the kerb and gutter adjacent to Sails on Lavender Bay restaurant and to the turning circle at Henry Lawson Avenue to improve both vehicle and pedestrian access at the wharf interchange.

These works are located within the proposal area as identified in refer to Figure 3-1. A detailed description of the proposal is provided in Section 3.

For the construction works, a temporary compound and work area would be established within Blues Point Reserve adjacent to the wharf, comprising a site shed and storage containers for tools and some materials. The final location of the temporary compound is to be confirmed in consultation with North Sydney Council. The indicative location of the temporary compound and construction work area is shown in Figure 3-1.

In addition, the marshalling and storage of most waterside construction materials and equipment would be carried out by a contractor at an approved off-site facility (the operation of this facility is not part of the proposal being assessed). Construction materials and equipment would be delivered to/removed from the site using barges. A majority of the waterside construction would be undertaken from barges on Sydney Harbour with only minor waterside works such as connection to services being undertaken from land.

Construction of the proposal is expected to commence from April 2016 and is likely to take four months, weather permitting. However, for the purpose of the environmental assessment Roads and Maritime has considered impacts for up to six months of construction. The wharf would be closed and removed prior to the construction of the new wharf.

Why is it needed?

The proposal is essential to provide wharf access for people with a disability to meet the requirements of the Disability Discrimination Act 1992 (DDA), such as current legislative standards for disabled access, and future ferry service requirements identified in the Sydney’s Ferry Future report (TfNSW 2013).
What alternatives were considered?

Two options were identified for the proposal. These were:

• Option 1 – Do nothing (base case option)
• Option 2 – Replacement of the existing McMahons Point Wharf with the new McMahons Point Wharf.

Option 2 has been selected as the preferred option as it was found to best meet the needs for the Ferry Wharf Upgrade Program (refer to Section 2.1), and the objectives and criteria for the proposal (refer to Section 2.3). Specifically it would provide access for people with a disability whilst minimising impacts on the local environment. It also avoids the need for regular major maintenance to keep the wharf operational due to the existing wharf being at the end of its serviceable life.

How does the proposal satisfy the project need?

The proposal satisfies the project need by providing a wharf interchange including a wharf that provides access for people with a disability in accordance with DDA for no less than 80 per cent of the high and low tide levels listed in standard tide charts.

Statutory and planning framework

State Environmental Planning Policy (Infrastructure) 2007 permits development on any land for the purpose of wharf or boating facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a wharf and boating facility and is to be carried out by Roads and Maritime, it can be assessed under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). Development consent is not required.

Community and stakeholder consultation

Key government stakeholders including North Sydney Council and Sydney Ferries, as well as the local community, have been consulted during design development and the preparation of the REF. Consultation will continue prior to and during construction of the proposal.

What are the main beneficial outcomes expected?

The proposal will provide the following benefits:

• Improved commuter facilities by providing a practical, functional and robust ferry commuter wharf with appropriate waiting and standing areas, passenger seating and shelter while allowing for the enjoyment of good weather, harbour views and aquatic activity.
• Encouraging an increase in commuters using the upgraded wharf services and ferry services once the redevelopment is completed and the wharf operational.
• Improved access for people with a disability
• Reduced wharf maintenance costs
• Safeguard and maintain the heritage significance of McMahons Point Wharf through incorporating a 50 year design life
• Provision of a wharf that is resilient to projected sea level rise due to climate change
• Contribute to achieving a consistent thematic design for all upgraded wharves in Sydney Harbour, to unify and identify the harbour wharves and ferry commuter system
- Improved water safety as berthing faces would be located in deeper water reducing the risk of vessels hitting the seafloor
- Reduced vandalism with the use of appropriate materials, surfaces and designs
- Improved access from the adjoining residential area to a range of cultural sites around the harbour
- Improved interrelationship of waterway and foreshore uses through more effective access to water-based public transport.

The additional berthing face would reduce congestion. This would be expected to minimise the possibility of incidents such as the collision of vessels.

**Environmental impacts**

The key environmental impacts of the proposal and associated management measures are summarised below:

**Noise and vibration**

During the construction phase:

- There would be exceedances of the noise criteria by up to 18 dB(A) for residential receivers during the daytime period during construction
- There would be exceedances of the noise criteria by up to 44 dB(A) for residential receivers during the night time period during construction
- There is potential for an exceedance OEH’s sleep disturbance screening criteria of up to 23 dB(A) during intricate lifts (11pm to 7am) and 44 dB(A) during hammering of piles (5am to 7am) which could cause awakening
- With windows open, there is potential that noise levels at the facade of the nearest sensitive receiver during the night time period would be up to 78 dB(A) during intricate lifts (11pm to 7am) and 99 dB(A) during piling (5am to 7am) and could potentially affect the health and wellbeing of nearby residents
- There would be exceedances of the noise criteria by up to 26 dB(A) during piling works at Sails at Lavender Bay restaurant.

A noise and vibration management plan would be prepared prior to the commencement of construction and it would be implemented during the construction period. Noise and vibration impacts on the local community would be minimised by the implementation of suitable noise management strategies and restricting construction works to predominantly the day time period. However, piles would be installed during the night time period at the beginning of the proposal for about two weeks and there would be about 20 intricate lifts during the night over the construction period (up to about five months). The community would be informed of construction activities and a community information and complaints line would be provided throughout the works to take inquiries and follow up on complaints.

**Land surface**

- Soils would potentially be exposed during footpath and kerb and gutter upgrade works. There is the potential for exposed soils to be eroded by wind or rain, or polluted by accidental spills or leakages from plant and equipment. These impacts are considered low
- The proposal may potentially disturb ASS during the removal of piles. To minimise impacts, piles that have been removed would be checked for debris and any potential ASS would be removed, contained and disposed of in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (DECCW 2009c).

Impact on land surface would be minimised through the installation of booms fitted with silt curtains around all water-based works for sediment containment.
Landscape, visual and urban design

- Impact on landscape character would be moderate.
- The proposed replacement wharf would be visible from a range of points including the eastern side of Lavender Bay, Dawes Point, Walsh Bay, the Sydney Opera House and Sydney Harbour Bridge.

Overall views within the foreground zone would have a moderate impact, while viewpoints in the middle and background zones would have a moderate to low impact.

The design minimises impacts on landscape character and views. The location of the new pontoon minimises view loss of the harbour. Neutral colours and transparent materials have also been chosen to reduce reflectivity and complement the adjacent features of the land.

Water quality

- There is the potential for water pollution as a result of materials handling, spills and leaks, as well as waste accidentally entering the waters of Sydney Harbour during removal. Water pollution may also occur during transportation of materials to and from the wharf during construction
- Increased water turbidity may occur during construction due to the removal and installation of piles and the operation of construction vessels, especially in shallow waters.

The impact on water quality would be minimised through the installation of booms fitted with silt curtains around all water-based works for spill and sediment containment. Emergency spill kits would be kept on site at all times.

Flora and fauna

- Temporary loss of marine organisms attached to submerged surfaces (e.g. during the removal of piles)
- Temporary loss of rocky reef habitat due to piling operations
- Loss of organisms living in the sediments of the seabed (i.e. benthic biota) due to the placement of proposed new piles
- Disturbance of aquatic habitats from construction vessel propeller wash.

The disturbance of aquatic habitat would be minimised by setting up exclusion zones around rocky reef habitats.

Land transport and parking

- There would be additional traffic during construction, with 15 traffic movements per day comprising sub-contractors and concrete trucks travelling to and from the site
- Impacts to parking availability would occur due to the parking of concrete trucks and construction vehicles at Henry Lawson Avenue.

A Traffic Control Plan would be prepared prior to commencement of construction which would identify safe pedestrian paths and signage requirements to minimise impacts on traffic and pedestrians.

Water transport

- There would be increased water-based movements within Sydney Harbour due to construction vessels transporting plant, equipment, materials and personnel between an off-site facility (operated by a contractor and subject to separate approvals) and the construction site.
• All non-construction related vessels would be prohibited from entering the work area of the construction site and therefore would potentially temporarily impact on their movement.

• Water transport impacts would be minimised by clearly marking out the construction zone onsite and by informing commercial and recreational users of the changes to wharf access prior to and during construction.

Non-Aboriginal heritage
• During construction there would be minor temporary impacts on the heritage significance of the wharf due to the presence of construction hoarding, materials and equipment.

The 50 year design life seeks to safeguard and maintain the heritage significance of McMahons Point Wharf.

Heritage information would be placed on the site during the construction phase to interpret the historic development and use of McMahons Point Wharf.

Social and economic
• Passenger safety would be improved with berthing faces being located further offshore within deeper water, reducing the risk of vessels hitting the seafloor.

• The additional berthing face would reduce congestion. This would be expected to minimise the possibility of incidents such as the collision of vessels.

• Wharf access for people with a disability would be improved.

• Socio-economic impacts would be managed through continued communication and consultation with the community throughout the proposal.

Climate change
The new wharf is designed to be resilient to projected sea level rise. Detailed environmental safeguards and management measures to be implemented are provided in Chapter 7.

Justification and conclusion
The proposal is justified because it would meet the site specific objectives of providing wharf access for people with a disability in accordance with the DDA and current legislative standards for disabled access, and meeting future ferry service requirements identified in the Sydney’s Ferry Future report (TfNSW 2013).

The proposal is not likely to have a significant impact on the environment and accordingly an environmental impact statement is not required under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Display of the review of environmental factors
This review of environmental factors is on display for comment between 25 January 2016 and 15 February 2016. You can access the documents in the following ways:

Internet

Display
The review documents can be viewed at the following locations:

• Stanton Library, 234 Miller Street, North Sydney, NSW 2060.
  9am to 9pm Monday to Thursday
9am to 6pm Friday
10am to 5pm Saturday and Sunday
Except during public holidays

- Roads and Maritime Services Head Office, Level 9 101 Miller Street, North Sydney, NSW 2060.
  08.30am to 5pm Monday to Friday
  08.30am to 12pm Saturday
  Except during public holidays

How can I make a submission?
To make a submission on the proposal, please send your written comments to:
Wharf Upgrade Program – McMahons Point
Roads and Maritime Services
Locked Bag 928
North Sydney, NSW 2059

Comments can also be submitted by email to wharfupgradeprogram@rms.nsw.gov.au
Submissions must be received by 15 February 2016.

Privacy information
All information included in submissions is collected for the sole purpose of assisting in the assessment of this proposal. The information may be used during the environmental impact assessment process by relevant Roads and Maritime Services staff and its contractors.

Where the respondent indicates at the time of supply of information that their submission should be kept confidential, Roads and Maritime Services will attempt to keep it confidential. However there may be legislative or legal justification for the release of the information, for example under the Government Information (Public Access) Act 2009 or under subpoena or statutory instrument.

The supply of this information is voluntary. Each respondent has free access at all times to the information provided by that respondent but not to any identifying information provided by other respondents if a respondent has indicated that the representation should be kept confidential.

Any respondent may make a correction to the information that they have provided by writing to the same address the submission was sent.

The information will be held by the Roads and Maritime Services Head Office, Level 9 101 Miller Street, North Sydney, NSW 2060.

What happens next?
Following the submissions period, Roads and Maritime Services will collate submissions. Acknowledgement letters will be sent to each respondent. The details of submission authors will be retained and authors will be subsequently advised when project information is released.

After consideration of community comments Roads and Maritime Services will determine whether the proposal should proceed as proposed, or whether any alterations to the proposal are necessary. The community will be kept informed about this Roads and Maritime Services determination.

If the proposal goes ahead, Roads and Maritime Services proceeds with final design and tenders are called for construction of the project.
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1 Introduction

This Chapter introduces the proposal and provides the context of the environmental assessment. It provides a summary of the location, the need for the proposal, and identifies the purpose of this report.

1.1 Proposal identification

NSW Roads and Maritime Services (Roads and Maritime) proposes to redevelop the wharf interchange at Henry Lawson Avenue, McMahons Point (the proposal), referred to throughout this Review of Environmental Factors (REF) as the McMahons Point Wharf.

The proposal is located on the western shore of Lavender Bay, within the suburb of McMahons Point. The wharf is located within the North Sydney local government area (LGA) and surrounding suburbs include Lavender Bay to the north and Milsons Point to the east. Sydney Harbour surrounds the wharf in all other directions.

McMahons Point Wharf Interchange is located at the end of Henry Lawson Avenue. Immediately adjoining McMahons Point Wharf is Sails on Lavender Bay restaurant and Blues Point Reserve. Surrounding areas to the north and north west predominately comprise of residential uses, and to the west passive recreational uses. The proposal location is shown at Figure 1-1.

The proposal is part of the Roads and Maritime’s Wharf Upgrade Program. It is needed to improve ferry commuter services and to provide services that meet the requirements of the Disability Discrimination Act 1992 (DDA) and current standards for disabled access.

The main elements of the proposal include:

- Removal of existing McMahons Point Wharf
- Construction of new McMahons Point Wharf interchange comprising of:
  - A covered shelter
  - An uncovered bridge and gangway
  - An uncovered dual berth pontoon
- Landside upgrade works
  - Realignment of the kerb and gutter adjacent to Sails on Lavender Bay restaurant
  - Realignment of the kerb and gutter at the turning circle at Henry Lawson Avenue.

A detailed description of the proposal is provided at Chapter 3.

The marshalling and storage of most waterside construction equipment, plant and materials, and the pre-fabrication of parts, pre-casting of headstocks and fit outs for the proposal would be carried out by a contractor at an off-site facility. Associated construction materials and equipment would be delivered/removed for the site using barges, while landside components would be transported via the local road network from an off-site facility. The operation of an off-site facility does not form part of this proposal but would have the necessary approvals in place for such activities to be undertaken.

A temporary compound would be established on site for the duration of the construction period. The compound would be used for the marshalling and storage of landside construction equipment, plant and materials, and the pre-fabrication of parts which would be carried out by a contractor. The indicative location of the compound (refer to Figure 3-1) is to the immediate south west of the proposal.

Construction is anticipated to take up to four months following commencement of works, dependent on the weather. For the purposes of this report however a construction duration of up to six months has been assessed. Prior to the commencement of construction activities, the existing McMahons
Point Wharf would be closed to all ferries, water taxis and other water craft and subsequently removed.

The NSW Government has allocated funding in the 2015/16 budget for this work.

Figure 1-1 Location of the proposal

1.2 Purpose of the report

This REF has been prepared by RPS. For the purposes of these works, Roads and Maritime is the proponent and the determining authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The purpose of the REF is to describe the proposal, document the likely impacts of the proposal on the environment, and to detail measures to mitigate these impacts.
The description of the proposed works and associated environmental impacts have been undertaken in accordance with the provisions of clause 228 of the *Environmental Planning and Assessment Regulation 2000*, the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act), and the Commonwealth Government’s *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In doing so, the REF fulfils the requirements of section 111 of the EP&A Act, which Roads and Maritime examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF will be considered when Roads and Maritime determine:

- Whether the proposal is likely to have a significant impact on the environment, and if an environmental impact statement and the approval of the Minister for Planning under Part 5.1 of the EP&A Act is required
- The significance of any impact on threatened species as defined by the TSC Act and/or FM Act, in accordance with section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement
- The potential for the proposal to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Commonwealth Government Department of the Environment for a decision by the Minister for the Environment on whether assessment and approval is required under the EPBC Act.
2 Need and options considered

This Chapter describes the need for the proposal in terms of its strategic setting and operational need. It identifies the various options considered and the selection of the preferred option for the proposal.

2.1 Strategic need for the proposal

Sydney Harbour’s commuter wharves are an integral part of the Sydney transport system. The Transport Access Program (TAP) is an ongoing initiative to deliver modern, safe and accessible transport infrastructure (Transport for New South Wales (TfNSW), 2015). Following an assessment by Roads and Maritime of the condition of the existing wharves in Sydney Harbour for items such as safe berthing, lighting, structural integrity and disability access, along with the current provisions of commuter wharves to meet future ferry service requirements, it was concluded that the redevelopment of the commuter wharf at McMahons Point is required for ongoing operations.

The Disability Standards for Accessible Public Transport 2002 (DSAPT) and Disability (Access to Premises – Buildings) Standards (2010) (Disability Standards 2010) made under the DDA require all public transport infrastructure, including wharves, to provide fully compliant disabled access by 2022.

The proposal is therefore needed to improve ferry commuter services including items such as safe berthing, lighting, structural integrity and to provide services that meet the future ferry service requirements and requirements of the DDA and current standards for disabled access.

Operational needs – dual berthing

McMahons Point Wharf is currently serviced by the F3 Parramatta River route and the F4 Darling Harbour route during the commuter peak and weekday off-peak and weekends respectively. McMahons Point Wharf provides access to North Sydney for employment activities by workers from the Inner West and Parramatta River catchments, as well as local access from the McMahons Point catchment to the Sydney CBD for employment and leisure activities.

The capacity and complexity of Sydney CBD’s transport system is constraining Sydney’s ability to function as a liveable, modern and productive CBD (NSW Government, 2012). Patronage on Sydney ferry services has increased with McMahons Point Wharf being the 4th busiest wharf on the Sydney Ferries network. Based on the 2013 and 2014 ferry load census count, McMahons Point wharf has seen a seven percent increase in weekly journeys. Roads and Maritime has advised that there is currently congestion during peak times between ferries causing delays in travel times.

Future ferry service requirements have been previously identified as part of the Sydney’s Ferry Future (TfNSW 2013). Growing demand and additional services provided by the new Inner Harbour and River ferries will likely increase the number of vessel that would stop at McMahons Point. Table 2-1 shows existing, short-term and long term future services for the one hour AM peak and weekend one hour peak periods.

Table 2-1 Weekday AM and weekend peak one hour periods

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The NSW Government has committed to reducing the current average time between ferry services in the AM one hour peak from 7.5 minutes (current average time) to five minutes by 2016. This level of service will be difficult to meet based on a single berth configuration at McMahons Point, with associated customer and operational impacts leading to greater risks of commuter delays. Accordingly a dual berth is required to meet future ferry needs at McMahons Point Wharf interchange.

### Strategic planning and policy framework

The proposal is needed to improve ferry commuter services and to provide services that meet the requirements of the DDA and current standards for disabled access.

The proposal is consistent with the strategic aims and directions of relevant strategic planning documents. Strategic planning documents most relevant to the proposal are identified below.

**NSW 2021 A Plan to Make NSW No 1**

*NSW 2021 A Plan to Make NSW No 1* (Department of Premier and Cabinet 2011) is the NSW Government’s strategic business plan, setting priorities for action and guiding resource allocation over the next decade. The Plan sets out five strategies to:

- Rebuild the economy
- Return quality services
- Renovate infrastructure
- Strengthen our local environment and communities
- Restore government accountability.

The goals, targets and actions in this plan set the priorities for funding, guiding decisions and focusing the day to day work of the public sector.

This proposal is particularly relevant to the following NSW 2021 goals:

- Goal 7 – reduce travel times
- Goal 8 – grow patronage on public transport by making it a more attractive choice.
- Goal 9 – improve customer experience with transport services
- Goal 14 – increase opportunities for people with a disability by providing support that meets their individual needs and realise their potential
- Goal 20 – build liveable centres
- Goal 25 – increase opportunities for seniors in NSW to fully participate in community life.

The proposal is also relevant to the NSW 2021 priority action to ‘build wharves to significantly increase the speed at which passengers embark and disembark’.

The plan promotes improved coordination between transport modes and a renewed focus on customer satisfaction to deliver the highest possible standards of service to transport users across the NSW network.

The proposal is consistent with the goals of the plan as it would improve unassisted use of McMahons Point Wharf interchange by people with a disability, which would increase potential

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McMahons Point Wharf Interchange Upgrade
Review of Environmental Factors
The proposal also allows for wheelchair access simultaneously in both directions for those embarking and disembarking, increasing boarding efficiency. The new facilities provided by the proposal would improve the overall customer experience for ferry users and contribute to the liveability of Sydney.

**State Infrastructure Strategy 2012-2032**

The *State Infrastructure Strategy 2012-2032* (Infrastructure NSW 2012) is a 20 year strategy that supports the delivery and funding of infrastructure in NSW.

The strategy builds on the NSW Government’s existing public commitments and outlines a forward program for urban and regional projects, and reforms across transport, freight, aviation, energy, water, health, education and social infrastructure.

The strategy reports that almost 75 percent of commuter journeys to the Sydney Central Business District (CBD) are by public transport and that, due to the limitations of parking in the CBD, public transport will need to increase as employment in the CBD grows over the next 20 years. The proposal is consistent with the strategy as it supports increased patronage of public transport in Sydney.

**A Plan for Growing Sydney**

*A Plan for Growing Sydney* (Department of Planning and Environment (DP&E) 2014) sets the management framework for Sydney’s growth over the next two decades. One of the four key goals of *A Plan for Growing Sydney* is to provide a competitive economy with world-class services and transport. It aims to do this through a range of actions which include enabling opportunities to improve ferry services throughout Sydney Harbour and its tributaries.

The proposal is consistent with this plan by improving existing public transport services including increased accessibility, increased commuter comfort and more efficient travel times. The NSW Government is currently in the process of developing District Plans across Sydney. McMahons Point Wharf would be located within the North District (more recently referred to on DP&E’s website as North District) which will provide more specific actions to deliver on *A Plan for Growing Sydney*. The District Plans will inform decision making for infrastructure planning.

**North Subregion**

A key priority of the North Subregion is to improve transit connections throughout the Global Economic Corridor to better link centres and transport gateways. The proposal is consistent with the vision for the North subregion through improving the Harbour and its public access (DP&E 2015).

**Sydney’s Ferry Future**

Sydney’s Ferry Future (TfNSW 2013b) is an integral part of the Long Term Transport Master Plan (NSW Government, 2012). The strategy provides a 20 year plan to improve the ferry transport experience for customers and grow the Sydney Ferries service offering as part of a well-integrated transport system.

Integrated land use and transport planning for Sydney is targeting a very high proportion of trips to be undertaken by public transport. To meet this demand Sydney’s Ferry Future identifies the need to modernise wharves and to provide fleet upgrades across the network. It recognises that wharf upgrades would also connect ferry customers with better service integration across different transport modes in Sydney.


*The Disability Standards for Accessible Public Transport (2002) and Disability (Access to Premises – Buildings) Standards (2010)* are both standards made under the DDA. Each standard establishes prescribed minimum standards of accessibility for public transport buildings and conveyances and
public transport premises respectively. Both establish a mandatory upgrade timetable for public transport premises to meet the prescribed accessibility requirements.

The proposal includes the redevelopment of the wharf interchange at McMahons Point, providing access to people with a disability in accordance with current legislation and regulatory standards.

**Ferry Wharf Upgrade Program**

Roads and Maritime are the delivery agency for the upgrade of the Sydney ferry wharves within TAP. The specific objectives of FWUP include the following:

- Improve access for people with disabilities
- Enhance the efficiency of interchanging
- Improve passenger amenities
- Increase the rate at which passengers embark and disembark
- Develop a functional, distinctive and iconic design theme that will unify and identify Sydney Harbour commuter wharves
- Meet current demand and enable future growth
- Minimise construction impacts to customers and wharf operations
- Minimise the cost of ownership and maintenance
- Comply with the Marine Safety (Domestic Commercial Vessel) National Law legislation
- Discourage inappropriate activities at the wharves
- Ensure all wharves achieve compliance by 2022 (where possible) with the DDA, standards and codes of practice.

The proposal is consistent with all the objectives of the Roads and Maritime FWUP. In particular the proposal would provide a redeveloped wharf that meets current disabled access standards.

**NSW Long Term Transport Master Plan 2012**

*The NSW Long Term Transport Master Plan* (LTTMP) sets out the framework for the NSW Government to deliver an integrated, modern transport system that puts the customer first (TfNSW, 2012).

The LTTMP is a 20 year plan to improve the transport system in NSW. It sets the framework for the NSW Government to deliver an integrated, modern transport system that puts the customer first.

The plan also:

- Identifies the challenges that the transport system (including buses, heavy rail, light rail, ferry and private vehicles) in NSW needs to address to support the State’s economic and social performance
- Guides decision-makers to prioritise actions which address the most pressing challenges
- Identifies a planned and coordinated set of actions (reforms, service improvements and investments) to address the challenges
- Provides a map of future service and infrastructure developments which future decisions will be required to support, and against which proposed investments can be evaluated
- Guides the NSW Government’s transport funding priorities, providing the overall framework for how our transport system develops, whether it is the services that are delivered or the infrastructure that underpins them.

A key element of the plan is the need to address congestion in the Sydney CBD. The plan notes that over the next 20 years, trips into the Sydney CBD are forecast to grow by 31 per cent. This represents an additional 56,500 trips, the equivalent of 942 standard buses. This growth cannot be accommodated on the existing CBD road network, which would compound congestion and affect
economic growth. An integrated public transport solution is therefore needed to ease congestion in the CBD, including increasing the patronage of trips to the city by ferry.

The proposal is consistent with the goals of the plan as it would provide a redeveloped wharf along the existing ferry route which would increase the patronage of trips to the Sydney CBD by ferry.

**Ferry Strategic Operations Plan**

The TfNSW Ferry Strategic Operations Plan outlines the framework for improving the current Sydney Ferries Network over the short, medium and long term and identifies key assets and systems required to deliver a range of improvements. The plan summarises the status of the current network and based on a range of planning and policy considerations and analysis, identifies areas of improvement and phases of planning to achieve these improvements. The improvements are broken into two phases:

- Sydney’s “Improved” Ferry Network which represents initiatives to be adopted within five years
- Sydney’s “Optimal” Ferry Network which builds on the improved network to meet future requirements over a longer term period.

The plan identifies the need for development of new routes and services that respond to emerging employment hubs such as Barangaroo and population growth centres. The proposed redeveloped wharf would support the Ferry Strategic Operations Plan by providing improved access to the commuter wharf at McMahons Point.

**2.2 Existing infrastructure**

The existing McMahons Point Wharf Interchange comprises a wharf and bus stop on the eastern side of the Henry Lawson Avenue turning circle. This section describes the existing landside and waterside environment.

**Landside**

Henry Lawson Avenue is a bitumen road with a concrete kerb that extends about 240 metres to the east from Blues Point Road before terminating at the turning circle adjacent to the wharf (Figure 2-1). The turning circle comprises a kerb and is grassed with a mature fig tree located towards its centre. Four time restricted parking spaces (0.5 hour) are located on the southern side of the turning circle.

Land directly adjacent to the wharf falls gently by about 1.5 metres from the centre of the turning circle at Henry Lawson Avenue to the south western corner of the wharf shelter.

The site is directly adjoining the north eastern corner of Blues Point Reserve which spans the southern tip of McMahons Point. The reserve is generally comprised of managed grass and mature fig trees. A playground is located about 200 metres to the west of the wharf within the reserve. The reserve also includes toilet facilities, a water fountain, seats and picnic tables, a waste station (ie recycling station), and lighting.

Within the direct vicinity of the wharf, the reserve also comprises managed grass, bench seating, two light poles and a water point (ie tap) (Figure 2-2).

Located directly north of McMahons Point Wharf is Sails on Lavender Bay restaurant (Figure 2-3). The restaurant is located within a single-storey waterside building. Other developments within the vicinity of the wharf include:

- A residential apartment building identified as ‘La Corniche’ at 8 Henry Lawson Avenue, located west of the wharf
- A residential apartment building at 1B Henry Lawson Avenue, located north west of the wharf and on the northern boundary of La Corniche
- A serviced apartment building identified as ‘Harbourside Serviced Apartments’ at 2A Henry Lawson Avenue, located north west of the wharf.
A driveway servicing the above buildings, including Sails on Lavender Bay is located west of Sails on Lavender Bay.

A sandstone wall is located on the northern boundary of Henry Lawson Avenue between Blues Point Road and the vehicle access point noted above. A paved brick footpath located between the wharf and Henry Lawson Avenue extends along the foreshore to the west of the site. Located between Sails on Lavender Bay and the wharf are a brick and concrete services box and a small garden bed.

The foreshore of McMahons Point within the vicinity of the wharf appears to be reclaimed land and is retained by a sandstone block wall located to the south of the wharf, while a concrete wall extending beneath the wharf and Sails is located to the north.

Figure 2-1 Looking west from wharf entrance towards Henry Lawson Avenue turning circle
Figure 2-2 Looking south from the wharf entrance towards bus stop and Sydney Harbour

Figure 2-3 Looking north from Blues Point Reserve towards Sails on Lavender Bay with wharf on the right
Waterside

The wharf comprises a concrete deck on timber piles. The concrete platform has an area of about 19 metres by seven metres (Figure 2-4). The wharf connects to the land via a covered waiting area. To access the ferry a series of timber steps lead south, down to the wharf (Figure 2-5).

The wharf is a single berthing face used by commuter ferries, recreational vessels, water taxis and other water craft. The use of the single berthing face by all of these vessels has the potential to cause risk to public safety due to the risk of collision of vessels accessing the wharf. Road and Maritime has also advised that there is congestion during peak times between ferries causing delays in travel times.

At times when the water level is low, access to vessels is via timber steps. As such, the existing wharf does not meet the requirements of the DDA or current legislative standards for disabled access.

The existing wharf also comprises the following infrastructure:
- A metal handrail on the edge of the wharf
- Two bench seats on the concrete deck
- A sheltered waiting area housing five bench seats
- Two light poles and a garbage bin
- An information stand, a surveillance camera and an emergency help point
- A life preservation cabinet
- A dedicated bus zone west of the wharf.

The existing McMahons Point Wharf is shown at Figure 2-4 and Figure 2-5 below.

Figure 2-4 McMahons Point Wharf viewed from Henry Lawson Avenue
Figure 2-5 McMahon's Point Wharf viewed from Lavender Bay

2.3 Proposal objectives

The objectives of the proposal are to:

- Provide a wharf interchange that is accessible to people with a disability in accordance with the DDA, Building Code of Australia (2011), DSAPT, Disability (Access to Premises – Buildings) Standards (2010) and Australian Standard series 1428
- Increase speeds at which passengers embark and disembark to improve boarding efficiency and travel times
- Create a practical, functional and robust ferry commuter wharf with appropriate waiting areas, passenger seating, standing and shelter while allowing for the enjoyment of good weather, harbour views and aquatic activity
- Reduce potential public safety risk and impacts on water quality and aquatic ecology associated with vessels maneuvering within a shallow waterway
- Value for money.

In delivering the proposal Roads and Maritime seeks to meet the following criteria:

- Maintain the heritage significance of wharf and adjacent items.
- Provide civilian, fire and marine rescue/safety equipment.
- Reduce maintenance through the use of appropriate materials, surfaces and designs.
- Reduce vandalism with the use of appropriate materials, surfaces and designs.
- Eliminate unauthorised and inappropriate use of terminals and facilities.
2.4 Alternatives and options considered

2.4.1 Methodology for selection of preferred option

Commuter ferry wharves are not easily re-located due to the considerable impacts that result to adjacent public transport and vessel movements within Sydney Harbour, including changes to navigational lanes and routes. For this reason commuter ferry wharves are generally upgraded or redeveloped in or near their existing locations.

The sections below identify the options and alternatives considered for the proposal, the preferred option, and the design refinements that have been made to the proposal following feedback from the community.

2.4.2 Identified options

Two options were identified for the proposal. These options are detailed below.

Option 1 – do nothing (base case option)

The do nothing option would involve no active upgrade measures, outside of routine maintenance, to improve the existing McMahons Point Wharf. The existing wharf would continue to be used for ferry commuter services. Landside transport interchange facilities would remain unchanged.

Option 2 – Replacement of the existing McMahons Point Wharf with the new McMahons Point Wharf

Option 2 (full replacement) would involve the removal of the existing wharf and replacement with a new wharf. The new wharf would comprise a bridge, gangway and pontoon and would provide for dual berthing of aquatic vessels.

The proposal would be accessible to people with a disability by addressing existing access issues, as well as addressing potential ferry congestion at the wharf. The wharf upgrade would be consistent with the unifying visual theme developed for wharves to be replaced and/or upgraded throughout Sydney Harbour.

Minor upgrades to landside areas (ie realignment of kerb and gutter at eastern end of Henry Lawson Avenue) would also form part of the proposal.

2.4.3 Analysis of options

The two options were analysed against the objectives of the proposal and the additional criteria outlined at Section 2.3. A summary of the analysis including advantages and disadvantages of each of the option is outlined below.

Option 1 – do nothing (base case option)

The do nothing option would not improve wharf facilities at McMahons Point. The level of accessibility to the wharf in accordance with the requirements of the DDA, the DSAPT or the Disability (Access to Premises – Buildings) Standards (2010) would also not be improved as a result of Option 1 and there would not be any improvement in commuter comfort.

The current state is that the wharf if at the end of its serviceable life and major maintenance is regularly required to keep the wharf operational. Initially this option would not cost anything however it is likely that maintenance of the wharf would cost more than the other option considered for the proposal, as the wharf would deteriorate over time thus increasing maintenance works and associated costs. Option 1 would also not provide separate berthing faces for ferries and non-ferry related vessels and therefore would not address the issue of congestion during peak times between ferries and or allow the future increase in ferry services.

This option would result in no additional impact on views to and from the harbour. It would also have the least environmental impact of the two options considered as there would be no removal or
construction of structures and no disturbance of the land surface (both above and below the mean high water mark).

As this option would not achieve any of the proposal objectives and criteria (refer to Section 2.3) or the need for the Ferry Wharf Upgrade Program (refer to Section 2.1), particularly in regard to accessibility, it was not pursued further.

**Options 2 – Replacement of the existing McMahons Point Wharf with the new McMahons Point Wharf**

Option 2 would provide the following advantages:

- Meet the proposal objectives by providing a wharf that would comply with the requirements of the DDA and current legislative standards for disabled access for 80 per cent of the high and low tide levels listed in standard tide charts
- Reduce congestion and public safety risk and impacts associated with a having a dual berth wharf at McMahons Point
- Would both increase speeds at which passengers embark and disembark through providing improved accessible and dual berthing faces
- Would allow the future increase in ferry services
- Reduce maintenance through the use of appropriate materials, surfaces and designs.

Option 2 would have the following disadvantages:

- Wharf closed during construction of the new wharf
- Potential impacts associated with the disturbance of land surface (both above and below the mean high water mark) however these impacts would be managed through the measures identified at Section 7.2.
- There would be a change to existing views.

**2.5 Preferred option**

Option 2 (full replacement) is the preferred option as it was found to best meet the needs for the Ferry Wharf Upgrade Program (refer to Section 2.1), and the objectives and criteria for the proposal (refer to Section 2.3). Specifically it would provide access for people with a disability while minimising impacts on the local environment. It also avoids the need for regular major maintenance to keep the wharf operational due to the existing wharf being at the end of its serviceable life.

Two community information sessions were held on 12 June 2014 and 12 February 2015 and further meetings were held with community representatives from the Lavender Bay Precinct Committee and Friends of Sydney Harbour on 6 September 2015 and 10 October 2015. The feedback received from these meetings assisted with the development of three designs which are analysed in Section 2.5.1. From this a preferred design was selected. Chapter 5 provides further details of the community and stakeholder consultation which has occurred to date.

**2.5.1 Refinement of the preferred option**

Following the selection of the preferred option (refer to Section 2.5), three concept designs for the proposed McMahons Point Wharf interchange were investigated. Each design was developed to meet the operational requirements for a commuter wharf such as depth of water and navigation and the dual berthing requirement identified for McMahons Point Wharf. The three designs are detailed below.

Each of the concept design options below included similar landside upgrade works, including the realignment to the kerb and gutter at Henry Lawson Avenue, the construction of new or improved facilities (including the replacement of the existing bus stop at Henry Lawson Avenue, new electronic ticketing machines located at the wharf and the installation of way-finding signage) and re-
landscaping of the construction areas. A detailed description of the landside works is provided at Table 3-1.

**Concept Design 1**

Location 1 involved the positioning of the new wharf immediately to the south of the current wharf. It included an uncovered bridge and gangway extending from land to a covered pontoon as shown at Figure 2-6. The wharf extended from the land at an angle of about 65 degrees and extended into the harbour by about 40 metres.

![Concept Design 1](image)

**Figure 2-6 Concept Design 1**

During the community information session held on 12 June 2014, the community raised concerns about the impact on existing views from Blues Point Reserve adjacent to the turning circle, particularly those to iconic views to the Sydney Opera House and Sydney Harbour Bridge.
Concept Design 2

Following the initial community feedback noted above, a second concept (refer to Figure 2-7) was designed which attempted to reduce impact on views by moving the wharf south west out of the main view corridor.

This design included a new uncovered bridge and gangway extending from land to a new covered pontoon. The wharf extended from the land at an angle of about 135 degrees and extended into the harbour by about 60 metres.

This design was presented to the community at an information session held on 12 February 2015. The community strongly opposed this design due to its impact on iconic views, particularly of Sydney Harbour Bridge and Sydney Opera House, and there was a general preference to locate the wharf in the vicinity of the existing wharf.

Figure 2-7 Concept Design 2
Concept Design 3 (Preferred design)

Concept Design 3 was developed to address the feedback received from the community noted above. It was also developed following meetings with community representatives from the Lavender Bay Precinct Committee and Friends of Sydney Harbour on 6 September 2015 and 10 October 2015 to assist with refining the design to a point where it would be acceptable to the community.

This design includes a new covered shelter at generally the same location as the existing McMahons Point Wharf. A bridge, gangway at an angle of about 90 and 45 degrees respectively and pontoon extending into the harbour by about 40 metres.

Following extensive communication activities over about 18 months, this design is the preferred design given it would:

- Have the least impact on views and changes to the landscape character as it will be located wholly within Lavender Bay and out of (or as close as possible to being out of) the main view corridors to the Sydney Opera House
- Be in a similar location to the existing wharf as requested by the community in the information session on 12 February 2015 and as developed in consultation with Lavender Bay Precinct Committee and Friends of Sydney Harbour.

A detailed description of the preferred design (the proposal) is provided at Chapter 3.
Figure 2-8 Concept Design 3
3  Description of the proposal

This chapter describes the proposal and provides descriptions of existing conditions, the design parameters including major design features, the construction method and associated infrastructure and activities.

3.1  The proposal

The proposal would include the removal of the existing McMahons Point Wharf and construction of the proposed new wharf. Figure 3-1 to Figure 3-3 and Appendix A shows the proposed position and design. However, for the purposes of this REF, a broader proposal area (shown in red outline in Figure 3-1) has been assessed to consider potential changes to the position of the wharf or landside elements should they be required following further design development.

The proposal would include:

Removal of McMahons Point Wharf
• Prior to constructing the new McMahons Point Wharf, the existing McMahons Point Wharf including waiting shelter, tidal stairs and timber piles would be removed. Fixtures such as lights, posts, fencing, information totems and closed circuit television (CCTV) system would also be removed.

Construction of the proposed new McMahons Point Wharf
• Construction of a covered shelter about 20 metres long and 10 metres wide over the water. The shelter would be independent of the existing sea wall and connect to land at an angle of about 90 degrees and would be supported by about 12 steel piles. The shelter would include the provision of a stainless steel clad services pod including, for example, an electricity distribution board, Ferry Operations and Customer Information System (FOCIS), bins, signage boards and a help point. The waiting shelter would include glass screens at its northern and southern ends. Three arrestor piles would be installed adjacent to the covered shelter. Any changes to the proposed works which could result in additional environmental impacts to the sea wall would be the subject of additional environmental assessment
• Construction of an uncovered concrete bridge about three metres wide and approximately 11 metres long extending from the shelter at an angle of about 90 degrees. The bridge would connect to the gangway headstock support and would be supported on about 12 steel piles and precast concrete head stocks
• Construction of an uncovered aluminium gangway about 18 metres long and about three metres wide to a floating pontoon. The gangway would extend from the bridge at an angle of about 45 degrees. The gradient of the gangway would vary according to the tides
• Construction and installation of a rectangular steel floating pontoon off the gangway. The pontoon would be about 12 metres wide and 27 metres long and would have two berthing faces. The pontoon would be uncovered with stainless steel balustrades at the northern and southern ends and include seating. The floating pontoon would be held in place by four steel piles. The floating pontoon alignment would extend off the gangway at an angle of about 170 degrees
• Installation of lighting, CCTV, ladders to the water from the pontoon, life ring at the pontoon and tactile floor treatment at the wharf interchange (refer to Appendix A)
• The wharf would be constructed to be accessible to people with a disability except for the gangway which would be accessible for no less than 80 per cent of the high and low tide levels listed in standard tide charts.
Landside infrastructure

- Minor realignment to the kerb and gutter adjacent to Sails on Lavender Bay restaurant and around the turning circle at Henry Lawson Avenue to improve both vehicle and pedestrian access at the wharf interchange.
- Provision of new or improved facilities including:
  - Replacement of the existing bus stop at Henry Lawson Avenue
  - New electronic ticketing machines located at the wharf
  - Installation of bicycle racks adjacent to the wharf
  - Installation of way-finding signage.

The landside infrastructure works are as indicated in Figure 3-1. Detailed design for these elements is to be developed in consultation with North Sydney Council prior to commencement of construction. Any material changes to the proposed works or construction methodology which could result in additional environmental impacts to those assessed in this REF, would be the subject of additional environmental assessment.

The proposed ancillary facilities are detailed at Section 3.3.

Figure 3-1 Overview of the proposal
Figure 3-2 View of the proposed wharf viewed from the turning circle at Henry Lawson Avenue

Figure 3-3 View of the proposed wharf viewed from Lavender Bay
Additional views of the proposed wharf are provided at Section 6.8.
3.2 Design

3.2.1 Design criteria

The proposal has been designed to meet the Australian Standard AS 4997-2005 Guidelines for the Design of Maritime Structures, the Building Code of Australia, and Maritimes’ Standard Practice for Type C3 and C5 loadings using various materials and general purpose, heavy duty and heritage balustrades.

Further design criteria for the proposal include:

- Provide a roof form/shape that is innovative but is not visually intrusive or reflective, and minimises impact to views from adjacent/nearby residences and facilities
- Improve disabled access and the ability to use the wharves in a manner which is compliant (where possible) with the DDA and relevant standards
- Improve the orientation, location and layout of the shelter structures to help facilitate ferry operations and berthing, storage, parking and loading and unloading requirements
- Provide availability of non-operational faces of wharf structures for recreational use for boating, fishing and other recreational activities
- Minimise upgrade and maintenance costs by maximising economies of scale with the use of similar materials, elements and design/construction approach throughout Sydney Harbour
- Reduce maintenance by the use of appropriate materials, surfaces and details
- Reduce vandalism with the use of appropriate materials, surfaces and designs.

Horizontal and vertical alignment

The new pontoon would be at about a 170 degree angle to the land to improve ferry maneuvering when approaching and departing from the berthing face of the pontoon. This would improve service times of the ferries using McMahons Point Wharf interchange.

The vertical grade of the pontoon would be consistent with the requirements of the current disabled access standards and would meet the requirements of the DDA. The proposed bridge, gangway and pontoon would be constructed to be accessible to people with a disability for no less than 80 per cent of the high and low tide levels listed in standard tide charts. For the remaining 20 per cent of the time the gradient of the gangway would be maintained between 1:8 and 1:13.

Typical cross section

Cross sections of the proposal are provided in Appendix A. The cross section for the wharf interchange would provide a bridge and gangway width of about three metres to enable two wheelchair users to pass each other in opposite directions simultaneously.

Consistent wharf interchange design

A consistent thematic design for all upgraded wharf interchanges in Sydney Harbour has been developed to unify and identify the harbour wharf interchanges and ferry commuter system. The design of the proposal is consistent with the design concept for the Ferry Wharf Upgrade Program.

Service life

Appropriate capacity at the covered shelter and on the floating pontoon has been forecast from current and projected future demand for the McMahons Point Wharf interchange over the 50 year lifespan of the structures.

Structural replacement and upgrade work would be designed for about a 50 year service life while subject to wear from berthing forces and weather-induced stresses.
Dimensions

The size of the pontoon is determined by the wave action within the locality of the harbour and the need for it to remain relatively steady for passenger safety and ferry operations. Given the openness of the harbour in this location and the frequency of maritime activity, a larger pontoon than what is typically found elsewhere is required.

3.2.2 Engineering constraints

Constraints identified for the design and construction of the proposal include:

- Disabled access: The new bridge, gangway and pontoon is required to be accessible to people with a disability to meet the standards of the DDA and current legislative standards for disabled access.
- Sea level rise: The wharf interchange has been designed for future sea level rise from projected climate change. A sea level rise allowance of 500 millimetres over 50 years has been adopted for the proposal NSW Sea Level Rise Policy Statement (DECCW 2009).
- Weather and tide: The new bridge, gangway and pontoon has been designed to provide appropriate clearance of tide, storm surge and wave action during operation of the wharf interchange.
- Calm wind and water conditions are required for certain construction activities such as the removal and installation of piles and installation of glass and stainless steel balustrades and screens.

3.3 Construction activities

3.3.1 Work methodology

Construction is expected to commence in early 2016 and take up to six months to complete, weather dependent.

The proposed construction activities for the proposal are identified in Table 3-1. This staging is indicative and is based on the current preliminary design and may change once the detailed design methodology is finalised.

The methodology is based on the current concept design and may need adjustment to meet the site conditions or the type/size of equipment used by the nominated contractor during the construction period in consultation with Roads and Maritime.

Any material changes to the construction methodology which could result in additional environmental impacts to those assessed in this REF, would be the subject of additional environmental assessment.
### Table 3-1 Likely construction stages

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
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<tbody>
<tr>
<td><strong>Site establishment and enabling works</strong></td>
</tr>
<tr>
<td>• Establishment of a temporary compound (erect hoarding, site offices, amenities and plant/material storage areas etc) on the land. The temporary compound is anticipated to be about 75 square metres in area based on the size of site compounds used on the other recent wharf projects</td>
</tr>
<tr>
<td>• Establishment of a construction work area using floating booms to delineate this area. This would make allowance for the outward reach of the barge’s four anchorage points, over which marine vessels may not cross for safety reasons. The anticipated size of the barges is up to about 20 metres by 30 metres in size</td>
</tr>
<tr>
<td>• Site entry and exit points would be established for the construction work site</td>
</tr>
<tr>
<td>• Traffic control measures (including for vehicles, watercraft, pedestrians and cyclists) would be established in accordance with the traffic management plan (TMP). Appropriate wayfinding signage would be installed advising of alternative transport options where necessary</td>
</tr>
<tr>
<td>• Environmental controls would be established in accordance with the construction environmental management plan (CEMP) for the Proposal.</td>
</tr>
<tr>
<td><strong>Removal of the existing McMahons Point Wharf</strong></td>
</tr>
<tr>
<td>• Prior to the construction of the new wharf, the existing wharf would be closed and site entry and exit points would be established for the construction work site in this location.</td>
</tr>
<tr>
<td>• Up to three barges (about 20 metres by 30 metres in size) would travel to the site from the off-site facility. One barge would be fitted with a crane (about 12 metres high). When on-site it would be anchored by four points but would reposition around the site during the work, as required.</td>
</tr>
<tr>
<td>• The waiting shelter, tidal stairs, lights, posts, fencing, information totems and CCTV system would be loaded onto a barge by crane and transported to an appropriately approved and licensed facility for reuse and/or disposal.</td>
</tr>
<tr>
<td>• Steel (or timber) piles would be removed using a vibratory hammer to extract the piles from the bedrock. The hammer would be placed over the pile using a barge mounted crane. If the pile is unable to be pulled out, it would be cut level to the harbour bed to remain in situ. Divers would cut the pile at seabed level using appropriate underwater equipment</td>
</tr>
<tr>
<td>• Piles would be removed by barge to the off-site facility. The piles would be reused, where possible, or eventually removed to a licensed waste management facility for recycling or disposal.</td>
</tr>
</tbody>
</table>
### Activity

#### Installation of steel piles within the waterway

- Steel locator piles for the pontoon would be installed into bedrock. These piles would be transported by barge to the site from the off-site facility. There would be sufficient water to carry out piling operations for the locator piles. The installation of the bridge support piles would be carried out at or around high tide.
- Constructing pile foundation systems in bedrock consists of three components:

  **Phase 1** Drilling into rock would take three to four hours per pile plus setup time and pack up time (with continuous noise from the diesel generator and large electric motors whilst drilling the pile).
  
  Each pile would be lifted from the barge and put into place using a barge-mounted crane. A drill rig mounted onto a barge would attach to the pile using a helmet fitting. The drill rig would screw the pile into the bedrock to a depth of up to about three metres.
  
  About 30 nights would be required for these works.

  **Phase 2** The piles are hammered (using a 30 tonne weight) to refusal. Hammering of piles would take place at least one day after drilling of piles. It is anticipated that each pile would be hammered for one minute (approximately 10 hits with the hammer within one minute). For each pile this activity is likely to occur about five times over a period of around one hour. There are 30 piles to be hammered over about 15 morning sessions.

  **Phase 3** The steel piles would then be cut, welded and plugged with concrete.

#### Construction of new covered shelter, uncovered bridge, gangway

Construction of the new wharf interchange

- The top level of sandstone blocks from the seawall at the entrance to the wharf would be removed to allow construction of the new shelter and reinstated. The footpath would be raised by about 75 millimetres and would match the width of the entrance to the proposed wharf interchange.

- Following the works at the wharf entrance, the shelter, bridge, gangway and pontoon would be constructed. Most of the structures (e.g., beams, headstocks, and roof) would be pre-fabricated/pre-cast and transported to site from the off-site facility. Temporary walkways would be installed down each side of the structure. In-situ works would likely include two concrete pours (involving up to three concrete trucks) over about three days to construct the bridge and to fill piles.

- Intricate lifting and placement of components of the new wharf interchange would be carried out using a barge-mounted crane. This activity needs to be undertaken during calm environmental conditions (e.g., still water and minimal wind). Intricate lifts and placement can take up to about six hours. For lifting and placement to be completed while the environmental conditions are appropriate, intricate lifting and placement would commence at about 11 pm and may continue until about 7 am, Monday to Friday. There would be about 20 intricate lifts throughout the duration of the construction works.

- The new pontoon structure would be constructed at an off-site facility and floated to site by barge. The pontoon would be attached to the gangway.

- Connection of services (e.g., electrical power lines to be connected to the existing electrical services cupboard).
### Activity

#### Landside infrastructure
- The indicative construction methodology for the landside works is proposed to include the following activities:
  - Road construction works, including the realignment to the kerb and gutter adjacent to Sails on Lavender Bay restaurant and around the turning circle at Henry Lawson Avenue to improve both vehicle and pedestrian access at the wharf interchange
  - Construction of new or improved facilities including:
    - the replacement of the existing bus stop at Henry Lawson Avenue
    - new electronic ticketing machines located at the wharf
    - installation of bicycle racks adjacent to the wharf
    - the installation of way-finding signage
  - Re-landscaping of the construction areas.

#### Site clean-up
- The site would be cleaned up and restored to its previous state
- Controls and temporary structures would be removed
- A safety assessment of the structure would be carried out to identify any risks and rectify any safety hazards resulting from construction before opening these areas to the public
- All construction fencing/hoarding and signage would be removed.

### 3.3.2 Construction hours and duration
The proposal would be constructed over a period of about four months (weather permitting), commencing about March 2016. However, for the purpose of this REF a construction period of up to six months has been considered.

Construction would normally be limited to between the following standard work times:
- 7am to 6pm Monday to Friday
- 8am to 1pm Saturday.

Work outside of standard hours would also be required in order to carry out piling activities and intricate lifts from the barge mounted crane, due to requirements for still water. Activities that are likely to be undertaken outside of standard work hours are outlined below.

#### Intricate lifting activities
There would be about 20 lifts throughout the duration of the construction period.

Intricate lifting and placement of components of the new wharf would be carried out using a barge mounted crane. This activity needs to be undertaken during calm environmental conditions (still water and minimal wind). Intricate lifts and placement can take up to six hours. For lifting and placement to be completed while the environmental conditions are appropriate, intricate lifting and placement is expected to commence around 11pm and continue to about 7am.

#### Piling activities
Piling work typically takes around five weeks to complete (about 30 nights in total) toward the beginning of the construction period. Piling works are highly sporadic. There may be noise from
hammering and drilling of a pile for around 10 minutes or so and then no hammering/drilling noise for 30 minutes or more.

Installation of the piles would require calm environmental conditions (still water and minimal wind) so that the floating barge used for the piling can remain still for the piles to be installed accurately. Calm conditions are also required to provide safe conditions for the construction crew. The waterway is usually calmer early in the morning, with wind and swell increasing throughout the day. The conditions required for piling usually occur during this early morning period. As a result it is anticipated that the installation of piles would occur as follows:

**Summary of hours of night works for piling drilling activities**
- Setup for drilling from approximately 11pm to 12am
- Drilling of piles from approximately 12am to 6am
- Pack up generally from approximately 6am to 7am.

**Summary of hours of night works for piling hammering activities**
- Setup for hammering from approximately 4am to 5am
- Hammering of piles from approximately 5am to 7am.

### 3.3.3 Plant and equipment

The equipment to be used would be confirmed during the construction planning process. Typical plant and equipment likely to be used during construction would include:
- Generators
- Lighting towers
- Power hand tools
- Light vehicles
- Boats
- Barges
- Drill rigs (barge mounted)
- Cranes (barge mounted)
- Water pumps
- Chainsaws
- Concrete trucks
- Hammer drills
- Concrete boom pump
- Hand tools.

### 3.3.4 Use of silt curtains within the waterway

Advice has been provided by Waterways Construction regarding the suitability of certain lengths of silt curtains to minimise the movement of sediments disturbed during construction. This advice was provided for a similar wharf upgrade project at Balmain East and concluded that a complete sea depth curtain is problematic due to tidal flows in the Sydney Harbour area.

Marine Pollution Research provided additional comment on the use of a complete sea depth curtain at Balmain East Wharf which concluded that a complete sea depth curtain is not recommended as there is the possibility that mobilised silts contained within the curtains with no sub-surface water movement to facilitate settlement would exacerbate the actual turbidity (suspended solids) load in the enclosed waters. This would have a detrimental impact of trapped mobile species that would then be at risk from clogged gills.

Accordingly, a silt curtain, extending from a minimum of 100 millimetres above the water line and extending no less than 2.5 metres to below sea level would be installed around the entire
redevelopment work area at McMahons Point Wharf prior to commencement of works that disturb
the seafloor. If excessive turbidity of the water is observed during removal of the first few piles, a
second, moveable silt curtain will be installed around the piles being removed during each day of
operation.

3.3.5 Earthworks

Land disturbance would be limited to realignment of the kerb and guttering works.
Excavated material would be reused on site where possible or disposed of in accordance with the
_Waste Avoidance and Resource Recovery Act 2001_.

3.3.6 Source and quantity of materials

The proposal does not require the importation of fill material or disposal of materials from the
seabed as no reclamation or filling is required. Natural resources for construction include aggregate
for use in concrete batching and sand, aggregate and select material for the production of cement
and glass. Manufactured items, including steel, pre-cast components and pipes and utilities would
also be required.

Materials would be sourced from overseas and local commercial suppliers, using local suppliers
wherever feasible and cost-effective.

3.3.7 Traffic management and access

Most of the construction plant, equipment, materials and personnel would travel to the site by barge
or boat from the off-site facility. Some construction traffic movements would occur on the road
network with around 15 movements per day during peak construction times. These would be
managed in accordance with the management measures outlined in the traffic management plan
(TM) for the proposal. A traffic control plan would be prepared in accordance with _Traffic Control at
Work Sites Manual Version 4_.

3.4 Ancillary facilities

A temporary compound would be established adjacent to the wharf and operated for the duration of
the work. The compound would include site sheds for use as an office, mess and amenities as well
as a lay-down and storage area and potentially a container for storage of some tools, equipment and
materials. The indicative location of the compound site is shown on Figure 3-1 and would be subject
to the review and agreement of North Sydney Council.
3.5 Public utility adjustment

An electricity supply would be provided to the wharf. This would involve connecting to existing services adjacent to the waiting shelter.

It is not expected that there would be any public utility adjustment required for the proposal. As detailed at Section 5.4, Ausgrid and Sydney Water were notified of the proposal and neither raised any objections to the proposal or issues regarding servicing. Ausgrid and Sydney Water would be consulted during construction and where necessary applications for connections would be made.

3.6 Property acquisition

No property acquisition would be required for the proposal. The temporary construction compound would require approval from North Sydney Council prior to the start of works.
4 Statutory and planning framework

4.1 State Environmental Planning Policies

4.1.1 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 68(4) of ISEPP permits development on any land for the purpose of wharf or boating facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a wharf and boating facility and is to be carried out by Roads and Maritime Services, it can be assessed under Part 5 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the National Parks and Wildlife Act 1974 (NPW Act) and does not affect land or development regulated by State Environmental Planning Policy No. 14 – Coastal Wetlands, State Environmental Planning Policy No. 26 – Littoral Rainforests, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (Major Development) 2005.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in Chapter 5 of this REF.

4.1.2 State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) provides that development for the purpose of port and wharf facilities, or boat facilities (not including marinas) by or on behalf of a public authority that has a capital investment value of more than $30 million is State significant infrastructure and would require approval from the Minister for Planning under Part 5.1 of the EP&A Act.

The proposed McMahons Point Wharf interchange has a capital investment value of less than $30 million and does not trigger the State significant infrastructure provisions of the SRD SEPP.

4.1.3 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

The proposal falls within the area to which Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP Sydney Harbour) applies. As of 1 July 2009, regional environmental plans are deemed State environmental planning policies.

The site falls within the W1 Maritime Waters zone and W8 Scenic Waters Passive Use zone under the SREP. The proposal would be characterised as public water transport facilities under the SREP which are permissible with development consent. However, the ISEPP supersedes the SREP Sydney Harbour, accordingly the proposal is permissible without consent.

The objectives of the Sydney Harbour SREP are considered in Table 4-1 below.
### Table 4-1 Objectives of the Sydney Harbour SREP

<table>
<thead>
<tr>
<th>Objective</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) to ensure that the catchment, foreshores, waterways and islands of Sydney Harbour are recognised, protected, enhanced and maintained as an outstanding natural asset and as a public asset of national and heritage significance for existing and future generations.</td>
<td>The proposal protects and maintains the natural and heritage values of the area and their contribution to Sydney Harbour.</td>
</tr>
<tr>
<td>(b) to ensure a healthy sustainable environment on land and water.</td>
<td>The proposal would not result in any ongoing adverse impacts on the environment of the land or water. Appropriate safeguards would be applied to the work to minimise impacts in both construction and operation.</td>
</tr>
<tr>
<td>(c) to achieve a high quality and ecologically sustainable urban environment.</td>
<td>The proposal would introduce a number of ecologically sustainable development measures. The design has sought to minimise waste generation and elements would be recycled and reused wherever possible. The design of the new wharf is of high quality and would result in an improved visual appearance compared to the existing wharf.</td>
</tr>
<tr>
<td>(d) to ensure a prosperous working harbour and an effective transport corridor.</td>
<td>The proposal would enhance the role of the harbour as both a working harbour and an effective transport corridor by improving the facilities for water-based public transport. McMahons Point Wharf would be closed for the duration of construction. There would be some temporary disruptions to public transport access during the construction period but this would be of a temporary nature. Commuters may choose to use an alternative public transport option such as bus (refer to Section 6.6). There would be appropriate communication with commuters ahead of any disruption to ferry services.</td>
</tr>
<tr>
<td>(e) to encourage a culturally rich and vibrant place for people.</td>
<td>The proposal would improve access to a range of cultural sites around the harbour.</td>
</tr>
</tbody>
</table>
The proposal includes the closure of McMahons Point Wharf. However, once complete would not change existing arrangements to access the harbour or foreshore area.

During construction there would be some temporary disruptions to boat and pedestrian movements in and around the location of the proposal. These would be of a temporary nature and would be communicated to users of the waterway and commuters ahead of the work commencing.

The proposal would provide accessibility to the wharf in accordance with the DDA. Access to the wharf for vessels would also be improved by locating the berthing faces within deeper water.

The proposal has been considered in respect of the objectives of the SREP Sydney Harbour Zones W1 Maritime Waters and W8 Scenic Waters Passive Use in Table 4-2 and Table 4-3.

### Table 4-2 SREP Harbour Zone W1 Maritime Waters objectives

<table>
<thead>
<tr>
<th>Zone W1 Objective</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) to give preference to and protect waters required for the effective and efficient movement of commercial shipping, public water transport and maritime industrial operations generally.</td>
<td>The proposal would upgrade an existing commuter wharf providing greater accessibility, passenger comfort and improving public water transport in Sydney Harbour. There would be some temporary disruptions to public water transport during the construction period, however these would be of a temporary nature. The changes, including details of alternate transport options available, would be communicated to commuters and commercial craft operators ahead of the work commencing.</td>
</tr>
<tr>
<td>Zone W1 Objective</td>
<td>Comment</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td>(b) to allow development only where it is demonstrated that it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations.</td>
<td>The proposal would replace an existing commuter wharf with a new commuter wharf. It would not result in the obstruction of vessels in and around the harbour and would therefore maintain the effective and efficient movement of commercial shipping, public water transport and maritime industrial operations. There would be some temporary disruptions to boat and pedestrian movements in and around the location of the proposal during the construction period, however these would be of a temporary nature. The changes would be communicated to relevant boating groups and commercial craft operators ahead of the work commencing.</td>
</tr>
<tr>
<td>(c) to promote equitable use of the waterway, including use by passive recreation craft.</td>
<td>Both public and private vessels would be able to use the wharf for passenger pick up and drop off in operation. During the construction period there would be temporary disruptions to the use of the wharf, including establishment of a construction area in the water and around the wharf. These changes would be of a temporary nature and would be communicated to relevant boating users and commercial craft operators ahead of the work commencing.</td>
</tr>
<tr>
<td>Zone W8 Objective</td>
<td>Comment</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td>(a) to give preference to unimpeded public access along the intertidal zone, to the visual continuity and significance of the landform and to the ecological value of waters and foreshores.</td>
<td>The works are primarily water-based and therefore would not interfere with accessibility to the foreshore in operation. There would be some disruptions to public access to the foreshore during the construction period; however, this would be of a temporary nature. The ecological value of waters and foreshores would not be adversely affected in the long term. An aquatic ecology assessment has been undertaken which indicates that there would be no significant long term harm to marine species as a result of the proposal. Flora and fauna issues are assessed in Section 6.5. Any changes to access would be communicated to residents, businesses and commuters ahead of the work commencing.</td>
</tr>
<tr>
<td>(b) to allow low-lying private water-dependent development close to shore only where it can be demonstrated that the preferences referred to in paragraph (a) are not damaged or impaired in any way, that any proposed structure conforms closely to the shore, that development maximises open and unobstructed waterways and maintains and enhances views to and from waters in this zone.</td>
<td>The wharf would be suitable for limited private vessels to utilise the wharf on occasion. McMahons Point is located in the heart of Sydney Harbour, busy with watercraft activity. The occasional private vessel using the wharf will not adversely impact visual continuity or ecological values of the waters.</td>
</tr>
<tr>
<td>(c) to restrict development for permanent boat storage and private landing facilities in unsuitable locations.</td>
<td>Commuter ferries, private vessels, water taxis and commercial operators would continue to use the new wharf for pick up and set down passengers, with priority access given to ferries.</td>
</tr>
<tr>
<td>(d) to allow water-dependent development only where it can be demonstrated that it meets a demonstrated demand and harmonises with the planned character of the locality.</td>
<td>The proposal is the replacement of an existing regular water-based public facility. Demand for the proposal has been demonstrated in the Roads and Maritime’s Wharf Upgrade Program.</td>
</tr>
</tbody>
</table>
Zone W8 Objective | Comment
--- | ---
(e) to ensure that the scale and size of development are appropriate to the locality and protect and improve the natural assets and natural and cultural scenic quality of the surrounding area, particularly when viewed from waters in this zone or areas of public access. | The scale and size of the development is appropriate to the locality. A visual impact assessment has been carried out for the proposal which indicates impacts on the landscape character and views and vistas would be moderate.

The matters for consideration listed in Division 20 of the Sydney Harbour SREP are provided in Table 4-4.

**Table 4-4 Division 2 matters**

<table>
<thead>
<tr>
<th>Division 2 matters</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause 21 Biodiversity, ecology and environment protection</td>
<td>Flora and fauna issues have been considered and assessed for the proposal. An aquatic ecology assessment has been undertaken which indicates that there would be no significant long term harm to marine species as a result of the proposal. Impacts on vegetation would be temporary and minimised by appropriate environment protection management measures.</td>
</tr>
<tr>
<td>Clause 22 Public access to, and use of, foreshores and waterways</td>
<td>There would be some temporary disruptions to public water transport, during the construction period, however these would not be long term changes. The changes would be communicated to residents, businesses, commuters and commercial craft operators ahead of the work commencing. Alternative public transport options would be available while the wharf is closed in the construction period.</td>
</tr>
<tr>
<td>Clause 23 Maintenance of a working harbour</td>
<td>The proposal would enhance the role of the harbour as both a working harbour and an effective transport corridor by improving access to water-based public transport facilities in operation.</td>
</tr>
<tr>
<td>Clause 24 Interrelationship of waterway and foreshore uses</td>
<td>The interrelationship of waterway and foreshore uses would be unchanged in the long term as a result of the proposal.</td>
</tr>
</tbody>
</table>
Division 2 matters | Comment
---|---
Clause 25 Foreshores and waterways scenic quality | The proposal would have a moderate impact on the scenic quality of the area as discussed at Section 6.8.
Clause 26 Maintenance, protection and enhancement of views | There would be a low to moderate impact on the landscape character of the area as a result of the proposal. Refer to Section 6.8.
Clause 27 Boat storage facilities | The proposal does not involve boat storage facilities.

Clause 31 of the SREP Sydney Harbour requires that the Foreshore and Waterways Planning and Development Advisory Committee (FWPDAC) be given notice of proposals that fall within Schedule 2 and that any comments be taken into consideration. Schedule 2 includes public water transport facilities. Service providers are also required to be notified of the proposal. FWPDAC, Ausgrid and Sydney Water were notified and comments received are discussed at Section 5.4.

Clause 59 of the SREP Sydney Harbour requires the assessment of the impact of the proposal on the significance of heritage items located in the vicinity of the site. There are no SREP listed items at McMahons Point and consequently no items in or near to the proposal.

The proposal has also been considered in the context of the Sydney Harbour Foreshores and Waterways Areas Development Control Plan 2005 (DCP), as the site falls within the Foreshores and Waterways Area under the SREP. The proposal is considered to be consistent with the relevant planning principles and requirements of the DCP.

### 4.2 Local Environmental Plans

#### 4.2.1 North Sydney Local Environmental Plan 2013

The subject site is located within North Sydney Council local government area and is partially within the area to which *North Sydney Local Environmental Plan 2013* (LEP 2013) applies. Under LEP 2013 the indicative location of the compound is zoned RE1 Public Recreation.

As an ancillary component of a wharf facility, the temporary compound is prohibited within the RE1 zone. However, the ISEPP supersedes the provisions of the LEP, and as discussed in Section 4.1.1 the proposal is permissible without consent.

The ferry wharf is listed in the LEP 2013 as a heritage item and is also located within the McMahons Point South Heritage Conservation Area, however in the case of McMahons Point Wharf, the location and continuity of use of the wharf are of principal significance whereas the heritage significance of the existing wharf structure fabric is considered to be negligible. Refer to Sections 6.9 and 6.10 for potential heritage impacts.

### 4.3 Other relevant legislation

#### 4.3.1 Fisheries Management Act 1994

*The Fisheries Management Act 1994* (the FM Act) requires a permit to be obtained for works that are likely to:
- Harm marine vegetation such as mangroves, seagrasses and seaweeds
• Involve the use of explosives
• Obstruct fish passage
• Require dredging or reclamation.

An aquatic ecology assessment has been undertaken for the proposal which indicates that there would be no significant direct long-term harm to marine vegetation and that risk of harm to shallow sub-tidal marine vegetation would be temporary and minimised by mitigation measures.

The proposal does not involve explosives, obstruct fish passage or require any dredging or reclamation works.

Details of the proposal and a copy of the aquatic ecology assessment were provided to the Department of Primary Industries (DPI) (Fisheries) for review. DPI has confirmed in an email dated 17 September 2012 that that there is no requirement for a permit or formal notification under the FM Act for this proposal.

4.3.2 Management of Waters and Waterside Lands Regulations

Clause 65A and 67 of the Management of Waters and Waterside Lands Regulations requires that permission be obtained from the harbour master for the erection of or alteration to wharves or other structure in the Port of Sydney and/or disturbance to the bed of the harbour.

McMahons Point Wharf is located within the Port of Sydney. The Deputy Harbour Master has provided written permission to proceed with the proposal, subject to a number of conditions. These conditions of the approval have been included as a management measure at Section 6.7.3.

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These matters are considered in Appendix B and Chapter 6 of the REF.

The assessment of the proposal’s impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance. Accordingly, the proposal has not been referred to the Department of the Environment.

4.4.2 Native Title Act 1993

A search of the National Native Title Tribunal search application returned no native title claims for McMahons Point (accessed on 5 January 2015).

4.5 Confirmation of statutory position

An assessment of the relevant statutory planning instruments has concluded that the proposal can be carried out as development without consent under the provisions of the ISEPP and can be assessed under Part 5 of the EP&A Act by Roads and Maritime as a determining authority.

McMahons Point Wharf Interchange Upgrade
Review of Environmental Factors
5  Stakeholder and community consultation

This Chapter discusses the consultation undertaken to date, and future consultation for the proposal. The description contains the consultation strategy or approach used and the results of consultation with the community, the Aboriginal community and relevant government agencies and stakeholders.

5.1 Consultation strategy

Roads and Maritime has developed a communications plan for the McMahons Point Wharf redevelopment. The plan outlines the consultation and communication approach for the proposal. The plan is evolving and would change prior to commencement of construction, and throughout the delivery of the proposal as necessary.

The first step in the consultation strategy was to obtain community views about the upgrade of McMahons Point Wharf and the proposed concept design. In order to obtain initial community feedback, communications inviting comment were carried out in May and June 2014. Communications included a community update, posters, advertising, stakeholder letters and the establishment of a project webpage, all providing information about the upgrade and contact details for the project team. Community and stakeholders were invited to attend a community information and feedback session to find out more and share feedback, or could do so by submitting a feedback form or emailing or calling the project team.

A second phase of consultation was carried out on 2 February 2015 to present an additional concept design which was developed following feedback from the community and additional assessment. A number of factors were considered including, safety, efficient ferry operations, accessibility, and environmental and heritage impacts. Communications included a community update, posters, advertising, stakeholder letters and updates on the project webpage, all providing information about the design and contact details for the project team. Community and stakeholders were invited to attend a community information and feedback session where the new concept design was presented. These sessions also provided information about the initial design and the design constraints including local environmental and operational conditions. Opportunity was provided to ask questions and share feedback. Feedback could also be provided by submitting a feedback form or contacting the project team by email or telephone.

Feedback received during both phase 1 and 2 of consultation was considered and further assessments were carried out to determine a suitable alternative concept design. The project team sought feedback from community representatives during this planning process and on the preferred concept design. Consultation was carried out with the adjacent business to seek feedback on design concepts and with regard to minimising impacts during construction. Other local businesses were provided with information about proposed concepts and how to provide feedback or obtain further detail.

A third phase of communications was carried out on 6 November 2015 to provide community and stakeholders with an update and advise next steps. Communications were carried out by community and stakeholder notification, update of the project webpage and posters at McMahons Point Wharf. Communications and consultation will be carried out when detailed planning is completed and the Review of Environmental Factors is finalised for display and community comment. Community and stakeholders will be invited to view the Review of Environmental Factors and make comment. Community and stakeholders will be advised of the display of the Review of Environmental Factors by notification, advertisements and website update in line with the requirements of the Review of Environmental Factors display process.
On completion of the planning process and design, and before the start of construction, the community and stakeholders will be notified. Information will include the final design, construction start date, what to expect during construction, and contact details for the project team. Communications will be by community and stakeholder notification, update of the project webpage, posters at McMahons Point and Circular Quay wharves, advertisements, updates at transport.info, announcements on ferries and all who have contacted the project team during the consultation process will be notified.

Advice will be provided relating to any night works required during construction by community and stakeholder notifications and doorknocks in the local area. The project webpage will also be updated.

When construction is complete, community and stakeholders including customers will be advised by community and stakeholder notifications, posters, announcements on ferries and an update of the project website.

A summary of the consultation and communication activities undertaken to date for the proposal follows:

**Key external stakeholder engagement consultation: Phase 1, 2 and 3**

- Meetings with North Sydney Council officers on 30 April 2014 and 9 February 2015:
  - Attendees: Roads and Maritime’s project team, design and community engagement contractors and North Sydney Council Engineering & Property Services officers
  - Information was presented about the McMahons Point Wharf upgrade proposal and feedback sought including, local knowledge about the environment, community and stakeholders, council priorities, future responsibilities and council communications
  - Email to council officers with letters and Community Updates for the General Manager, Mayor, Victoria Ward Councillors and committees for distribution on 29 May 2014 and 2 February 2015
- Meetings with owners of adjacent business, Sails on Lavender Bay restaurant, March 2014, telephone call (phone message) and email 2 February 2015 and meeting 2 November 2015
  - Attendees: Roads and Maritime project team, design and community engagement contractors and restaurant owners
- Accommodation adjacent to wharf – 29 May 2014 and 2 February 2015 call and email
- Update for the local state member May 2014 and February 2015
- Meetings with representatives from Friends of Sydney Harbour and Lavender Bay Precinct Committee 17 September 2014, 3 December 2014, 6 September 2015 and 10 October 2015.

**Phase 1 consultation – May/June 2014**

Local Residents/businesses/commuters and other stakeholders were provided with the opportunity to view information, ask questions and comment on the proposed concept design.

Consultation and communication activities:

- A Community update was letterboxed to approximately 2,250 residents and businesses in North Sydney on 29 May 2014 and mailed or emailed to about 50 stakeholders including, local government; local community groups; maritime, environment, disability and transport interest groups; commercial and recreational river users; schools; and emergency services. The community update was also distributed to ferry customers
- The update included an overview of the project, invitation to community information and feedback session, and details of how to provide feedback and find out more
- Posters were displayed at McMahons Point and Circular Quay wharves inviting people to attend the community information and feedback session, and providing contact details for more information
An advertisement was published in the Mosman Daily on 29 May and 5 June 2014 inviting people to attend the community information and feedback session, and providing contact details for more information.

Roads and Maritime project website was updated to include information about the proposed upgrade of the wharf at McMahons Point and an invitation to attend the community information and feedback session.

A community information and feedback session was held on 12 June 2014 at the McMahons Point Community Centre. The session was run as a drop in with members of the Roads and Maritime project team, representatives from TfNSW and community engagement consultants available to answer questions and hear feedback. Six people attended.

**Phase 2 consultation – February 2015**

Local residents, businesses, commuters and other stakeholders were provided with the opportunity to view information, ask questions and comment on the new concept design.

Consultation and communication activities:

- A Community Update was issued via a letterbox drop to approximately 2,250 residents and businesses in North Sydney on 2 February 2015 and mailed or emailed to about 50 stakeholders including local government, local community groups, maritime, environment, disability and transport interest groups, commercial and recreational river users, schools and emergency services. The community update was also distributed to ferry customers.
- The community update included an overview of the project, invitation to community information and feedback session and details of how to provide feedback and find out more. All those who had contacted the project team during earlier consultation were invited to the community information session.
- Posters were displayed at McMahons Point and Circular Quay wharves inviting people to attend the community information and feedback session, and providing contact details for more information.
- An advertisement was published in the Mosman Daily on 5 and 12 February 2015 inviting people to attend the community information and feedback session, and providing contact details for more information.
- A project update was provided on the Roads and Maritime project website.
- A community information and feedback session was held on 12 February 2015 at the McMahons Point Community Centre. Community and stakeholders were invited to attend the session where the new concept design was presented along with information about the initial design and the design constraints including local environmental and operational conditions. Members of the Roads and Maritime project team, representatives from TfNSW and community engagement consultants presented, answered questions, and received feedback. Feedback was provided by submitting a feedback from and/or emailing or calling the project team. 131 attended the session.

**Phase 3 consultation – November 2015**

Local residents, businesses, commuters and other stakeholders were provided with an update and next steps including information about the upcoming display of the REF for public comment.

Consultation and communication activities:

- A Community update was issued via a letterbox drop to approximately 2,250 residents and businesses in McMahons Point and Lavender Bay on 6 November 2015, and mailed or emailed to about 50 stakeholders including local government, local community groups, maritime, environment, disability and transport interest groups, commercial and recreational river users, schools, and emergency services. The community update was also distributed to all who had contacted the project team during earlier consultation. The community update included an update, next steps, and contact details for more information.
• Posters were displayed at McMahons Point Wharf providing an update, next steps and contact details for more information
• Roads and Maritime project website was updated.

The community have raised issues for the proposal through the above community consultation and communication activities. Table 5-1 outlines the issues raised by the community to date and references where these issues have been addressed within the REF.

Any issues raised during the ongoing consultation and communication activities following the determination of the REF would be considered and any changes made to the proposal as appropriate. If required, additional environmental assessment would be carried out in respect of any changes.

**Table 5-1 Issues raised through community consultation and communication**

<table>
<thead>
<tr>
<th>Community Group</th>
<th>Issue Raised</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
</table>
| Local residents | Option 1 – 2014 – positioned in the location of the existing wharf with uncovered bridge and gangway extending from land to a covered pontoon | • Wharf size and position for each location is determined by:  
  • local wind and wave conditions which affect the stability of the floating pontoon in most conditions  
  • requirement for stability of the floating pontoon in most conditions meeting safety and DDA requirements  
  • water depth for safe and efficient ferry access  
  • number of berthing faces required to meet service demands efficiently. |
  • Located too far into the bay, would like to see it placed alongside the foreshore like Milsons Point Wharf  
  • Put the new pontoon on the south side of the point where ferries in both directions can berth and proceed forwards and the existing wharf can be used during construction. |

In response to community feedback received during consultation in 2014 further assessments were carried out to determine if there was a suitable alternative wharf location. An alternative proposal locating wharf to the south was presented to the community in February 2015. Refer to Chapter 2.
<table>
<thead>
<tr>
<th>Community Group</th>
<th>Issue Raised</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• The new wharf will be an eyesore, vandalism of the harbour and will destroy a scenic area.</td>
<td>• Visual assessments have been undertaken in the planning for the new wharf giving consideration to local view corridors and will form part of the final approved Review of Environmental Factors (refer to Section 6.8).</td>
</tr>
<tr>
<td></td>
<td>• Narrows the entry into Lavender Bay creating a hazardous environment for boats.</td>
<td>• The positioning of the wharf takes into account boating channels to ensure water traffic is not impeded (refer to Section 2.4.1).</td>
</tr>
<tr>
<td></td>
<td>• Ferry Master’s operational preferences should not be taken in consideration when the resulting design and location are not supported by the community.</td>
<td>• Consultation is undertaken with ferry masters during design process to ensure safe and efficient access. Refer to Chapter 5.</td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>Option 2 – February 2015 – positioned to the south of the existing wharf with an uncovered bridge and gangway extending from land to a covered pontoon</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Concerns raised about the impact of south westerly weather conditions in this location on customer safety and amenity</td>
<td>• Both berthing faces need to be open to provide safe ferry operation</td>
</tr>
<tr>
<td></td>
<td>• Pontoon berthing faces have no screening therefore no protection from south westerly weather</td>
<td>• Some screening will be included to the pontoon to provide a level of protection</td>
</tr>
<tr>
<td></td>
<td>• Concerns about pedestrian navigating the bridge and gangway in south westerly weather conditions with no roof or glass screening</td>
<td>• Covered walkways and screening are being assessed to determine any visual and design impacts</td>
</tr>
<tr>
<td></td>
<td>• A long way for mobility impaired customers to navigate from land side bus/car drop off without shelter – cannot use walking stick and umbrella at the same time</td>
<td>• In response to community feedback received during consultation further assessments were carried out to determine if there was a suitable alternative wharf location. The project team worked with community representatives during the development of a preferred proposal positioning the new wharf in the location of the existing wharf (refer to Section 3.2.).</td>
</tr>
<tr>
<td></td>
<td>• Prefer the location of the current wharf as it offers the best protection from the south westerly weather, however not extending into the harbour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Prevailing winds come from the south west this is demonstrated by the poor condition of the grass at McMahons Point – current wharf location provides the best protection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How will the impacts of south westerly weather events on customer amenity and safety on the bridge and gangway be addressed?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The existing wharf is very difficult to use with a pram, a new wharf with a ramp will be a great improvement, even better if it was covered.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Concerned about the potential visual impact of a structure extending 61 metres into the harbour.</td>
<td>• Visual assessments form part of the REF required for determination of the proposal. Mitigation recommendations made in the visual assessment will be adopted (refer to Section 6.8).</td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td></td>
<td>• Given that new wharf is in a significantly different location to the existing wharf, why can’t the existing wharf remain open during construction?</td>
<td>• If the new wharf is constructed in the location to the south the existing wharf would remain open during construction (refer to Section 2.4).</td>
</tr>
<tr>
<td></td>
<td>• Removal of the existing wharf would improve the ‘heritage’ views to the Opera House. Although I understand that there would be objections to the location of this new wharf – harbour views disrupted, etc – the eventual removal of the old wharf will create a great setting for harbour views at the end of the roundabout.</td>
<td>• Removal of ferry wharf facilities at this location would not be consistent with the program objectives.</td>
</tr>
</tbody>
</table>

Option 3 – October 2015 – positioned in the location of the existing wharf with a covered waiting area and uncovered bridge and gangway extending from land to an uncovered pontoon

<table>
<thead>
<tr>
<th>Community Group</th>
<th>Issue Raised</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Approve of the retention of the weather proof waiting area roughly in the footprint of the existing shelter, good connection to buses</td>
<td>• Noted.</td>
</tr>
<tr>
<td></td>
<td>• Pontoon located too far to the south, would like the pontoon shifted to the north</td>
<td>• Feedback will be considered by the project team during detailed design process (refer to Section 2.4).</td>
</tr>
<tr>
<td></td>
<td>• Will be a long uncovered walk on the bridge and gangway from the sheltered waiting area to the pontoon, would like the bridge removed or shorter</td>
<td>• Feedback will be considered by the project team during detailed design process (refer to Section 3.2).</td>
</tr>
<tr>
<td></td>
<td>• Continue to question the need for dual berthing at McMahons Point Wharf</td>
<td>• Refer to ‘Dual Berthing’ under issues raised include in this report (refer to Section 2.1).</td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
|                | • Further consultation should be carried out with community, council officers and councillors  
  • Alternative concept proposed.                                                                                                               | • The team has considered this option previously. It is not feasible due to the orientation of the pontoon and also due to the positioning of a gangway to access the pontoon  
  • Option 3 included the pontoon being located within a similar location as proposed at option 1 and facing into the longest fetch. During public consultation meetings it was identified that prevailing weather at the site is from the South. A review from the ferry masters also confirmed local weather conditions at the site. To ensure the safety of loading and unloading of customers a north-south pontoon orientation as per the preferred option is recommended. This also corresponds to the current berthing alignment of the existing wharf  
  • The position of the gangway in the middle of the short face of the pontoon does not allow for any overrun of the ferries on the inside berthing face. There would be strong probability of hitting the gangway in this option each time a ferry overran the wharf (refer to Section 2.4). |
|                |                                                                                                                                                                                                          | • Alternative concept proposed.  
  • This option has the same issue in relation to pontoon alignment (refer to the discussion above)  
  • The position of the gangway on the end of the long face of the pontoon does not allow for any overrun of the ferries on the inside berthing face. There would be strong probability of hitting the gangway in this option each time a ferry overran the wharf, as above option (refer to Section 2.4). |
<table>
<thead>
<tr>
<th>Community Group</th>
<th>Issue Raised</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Alternative concept proposed.</td>
<td>• This pontoon alignment is not acceptable. We have considered this option previously and this is not feasible due to the positioning of gangway to access the pontoon.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The position of the gangway on the end of the long face of the pontoon does not allow for any overrun of the ferries on the inside berthing face. There would be strong probability of hitting the gangway in this option each time a ferry overran the wharf.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Option 3 allows for space between the end of the pontoon and the pile arrestors in between the pontoon and the concrete bridge to avoid a ferry from striking the bridge and/or gangway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A review of the length of the bridge will be reviewed at detailed design (refer to Section 2.4.)</td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td></td>
<td><strong>All options</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Customer suffers from motion sickness and believes a floating pontoon</td>
<td>• Milsons Point is a unique location and due to the water depth and wave climate a hydraulic</td>
</tr>
<tr>
<td></td>
<td>positioned out in the bay would frequently be unstable</td>
<td>pontoon has been used</td>
</tr>
<tr>
<td></td>
<td>• Have the same type and location of wharf as Milsons Point.</td>
<td>• The proposed design for McMahons Point Wharf with a floating pontoon is operationally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>considered the safest and most efficient design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The proposed floating pontoon size and weight will provide sufficient stability to meet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DDA requirements at least 80% of the time in this location (refer to Section 2.3).</td>
</tr>
<tr>
<td></td>
<td>• Pensioner Excursion Tickets can’t be purchased on buses from 1 June 2014</td>
<td>• Gold senior/Opal pensioner now available.</td>
</tr>
<tr>
<td></td>
<td>and the places where they are sold are limited, many elderly passengers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>are mobility impaired and it can be difficult to get to the places where</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tickets can be purchased.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Disagree that the fetch measurement used in the assessments for the</td>
<td>• The fetch is the distance over which the wind can blow and the effect of the seas can travel</td>
</tr>
<tr>
<td></td>
<td>wharf design. Measurement should be between Barangaroo and McMahons Point</td>
<td>unobstructed by land, at McMahons Point the fetch has been assessed as being approximately six</td>
</tr>
<tr>
<td></td>
<td>as the prevailing wind comes from the south west</td>
<td>kilometres coming from Rose Bay up the harbour (refer to Section 6.2.1).</td>
</tr>
<tr>
<td></td>
<td>• The site is not open to a fully developed 6km fetch wave from Rose Bay.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between there and Lavender Bay are several headlands. Each of these cuts off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>part of the wave energy spectrum as the waves diffract around the headlands,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reorienting the energy away from the wind direction. There will, statistically</td>
<td></td>
</tr>
<tr>
<td></td>
<td>be a largest 1 in 100 year wave, but this might come from Balmain due to a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>south-westerly wind or the south east, springing from Darling Point.</td>
<td></td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• Disagree with local environmental conditions assessments determining that the pontoon must be oriented towards the southeast due to the fetch. This applies only to wind dominated sites not McMahons Point</td>
<td>• The importance of vessel wash and the fact that there is considerable vessel wash at this site at McMahons Point is acknowledged however wind waves must be considered not just for operational safety but also for potential damage to and longevity of the wharf structures</td>
</tr>
<tr>
<td></td>
<td>• Vessel movements and associated wakes they create dominate the wave spectrum at this part of the harbour</td>
<td>• A detailed wave analysis of the site has been undertaken determining both wave amplitude and wave period and wavelength with assessments from various directions. As a result it was determined that during storm conditions, the pontoon must be oriented into the south east otherwise the pontoon would damage itself and its pile guides. The effect of waves from the south and south west (both vessel wash and wind waves) have been allowed for by widening the pontoon to 12m and ballasting and increasing the draft. By reorientating the pontoon to being abeam, the long period waves from the south east would be very dangerous to the pontoon and also to passengers trying to embark / disembark the ferries, even in moderate weather. This has been reaffirmed by a senior master mariner from Harbour City Ferries (refer to Section 6.2).</td>
</tr>
<tr>
<td></td>
<td>• These wave trains spread laterally at a plus or minus angle to the shipping channel depending whether they are proceeding upstream or downstream. The predominance of vertical seawalls in the area also means that much of the wave energy is reflected, recrossing the channel at various angles. Whilst there are thus a variety of wake wave angles, the best average direction is perpendicular to the channel, which roughly suits a north-south pontoon orientation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A survey of actual wave orientation data should be undertaken.</td>
<td></td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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<td>---------------------------------</td>
</tr>
</tbody>
</table>
|                 | • Dual berthing  
• Build a single berth new wharf in the footprint of the existing wharf  
• Dual berthing is not required at the wharf. Instances where ferries have to wait to have access are rare  
• A two berth pontoon makes no sense because the wharf at Luna Park with the same ferry services and higher usage has only one berth  
• McMahons Point is a relative small community and the potential for expansion is extremely limited. We do not have large high rises with the exception of Blues Pt tower. Such residential developments are occurring in North Sydney but will be better served by the train station and bus services  
• Single berthing would mean the wharf could be smaller and closer to land. | • As part of the Sydney's Ferry Future strategy, ferry service frequencies and operating hours will expand, including services stopping at McMahons Point Wharf. Expansion of services across the ferry network will be supported by the new ferry hub at Barangaroo which will relieve capacity constraints at Circular Quay as well as serving the new commercial district. A new Sydney Ferries timetable was introduced in October 2013 as the first stage of Sydney's Ferry Future, with additional services and more ferries operating at key wharves, including McMahons Point wharf  
• An expansion of services for the Sydney Ferries network also requires supporting infrastructure, such as dual berthing at wharves, to achieve reliable timetable operation for customers. Dual berthing will allow two ferries to access the wharf at the same time, providing more efficient drop off/pick up of customers and avoiding ferries having to wait offshore for berthing space. The dual berthing of some wharves will assist in improving services in the short term and delivering on the future ferry network outlined in Sydney's Ferry Future  
• McMahons Point Wharf is a location that requires a facility for dual berthing to achieve customer and network improvements for the Sydney Ferries network. Under the current timetable, there are already times when ferries have to wait offshore for berthing space at McMahons Point with a number of ferry services stopping at this wharf during the commuter peak and on weekends  
• This will increase over time as more ferries use the wharf with the introduction of new Inner Harbour and Parramatta River ferries. Refer to Section 2.1. |
<table>
<thead>
<tr>
<th>Community Group</th>
<th>Issue Raised</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• I think the idea of having dual berthing at the new wharf is an excellent idea, and will reduce delays.</td>
<td>• Dual berthing is included in the design (refer to Section 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Request for increased Darling Harbour express services.</td>
<td>• TfNSW assesses customer demand to determine the best provision of services with the resources available&lt;br&gt;• At this stage there are no planned additional Darling Harbour express services (refer to Section 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Build the new wharf in the footprint of the existing wharf using the same design as Milsons Point Wharf.</td>
<td>• The proposed design for McMahons Point Wharf with a floating pontoon is operationally considered the safest and most efficient design&lt;br&gt;• Milsons Point is a unique location due to the water depth and wave climate. The proposed hydraulic pontoon responds to these unique conditions&lt;br&gt;• The new wharf design, location and orientation, is determined by the environmental conditions which include, water depth and wave climate in each location. The aim is to provide the safest and most efficient access for customers and ferries. The new wharf must provide DDA compliance, stability, safe and efficient operations and the number of berthing faces required to meet current and future service demands&lt;br&gt;• The current Milsons Point Wharf is single berth. Dual berthing is required at McMahons Point (refer to Section 3.2).</td>
</tr>
<tr>
<td>Community Group</td>
<td>Issue Raised</td>
<td>Response/Where addressed in REF</td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td></td>
<td>• Regular commuter between Drummoyne and McMahons Point advises the new Drummoyne Wharf is a vast improvement on the old wharf</td>
<td>• Noted.</td>
</tr>
<tr>
<td></td>
<td>• Ferry access and drop off/pick up is much more efficient, the wharf provides excellent accessibility and is much more pleasant to use.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Retain the land side shelter for bus and ferry customers. Include glass screening to protect customers from wind while allowing winter sun onto seating in the shelter and on the pontoon.</td>
<td>• Feedback for the new wharf and interchange design are currently being considered taking in to account potential view impacts, DDA and operational requirements (refer to Section 2.1).</td>
</tr>
<tr>
<td>Local businesses</td>
<td>• Sails on Lavender Bay restaurant – request to avoid closure in their peak operating time October to December.</td>
<td>• It is anticipated that this request could be accommodated within the delivery schedule (refer to Section 3.2.2).</td>
</tr>
<tr>
<td></td>
<td>• Sails on Lavender Bay restaurant – request to minimise potential visual impact of the new waiting area on some diners.</td>
<td>• The project team will carry out assessments with further consideration to visual impact from the restaurant in the detailed design process (refer to Section 6.8).</td>
</tr>
<tr>
<td>All stakeholders</td>
<td>• Will there be further consultation.</td>
<td>• Community and stakeholders will be advised of the display of the REF by notification, advertisements and website update in line with requirements of the REF display process (refer to Chapter 5).</td>
</tr>
</tbody>
</table>

### 5.2 Aboriginal community involvement

The proposal has been considered against the requirements of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime, 2011) (PACHCI). This procedure is generally consistent with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b). An outline of the procedure is presented in Table 5-2.
Table 5-2 Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>An internal Roads and Maritime assessment to determine whether a project is likely to affect Aboriginal cultural heritage.</td>
</tr>
<tr>
<td>Stage 2</td>
<td>A preliminary external assessment with limited stakeholder consultation to determine whether a project requires Part 6 approval from the NSW Office of Environment and Heritage under the <em>National Parks and Wildlife Act 1974</em>.</td>
</tr>
<tr>
<td>Stage 3</td>
<td>If a Part 6 approval is required, Aboriginal community consultation and investigation is required. Preparation of cultural and archaeological assessments to be undertaken with the involvement of the Aboriginal community.</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Implementation of the assessment process.</td>
</tr>
</tbody>
</table>

Aboriginal cultural heritage impacts are not expected as a result of the proposal (refer to Section 6.10).

The Aboriginal Cultural Heritage Advisor (ACHA) for Roads and Maritime Sydney Region has considered the documentation referred to above and issued a Stage 1 clearance letter in accordance with the PACHCI (Appendix C). An Aboriginal Heritage Impact Permit under the *National and Parks and Wildlife Act 1974* is not required for the proposal. Aboriginal heritage is addressed further in Section 6.10.

### 5.3 ISEPP consultation

Clauses 13, 14, 15 and 16 of the ISEPP provide a requirement for public authorities to consult with councils and other public authorities, when proposing to carry out development that is permissible without consent. Council originally provided feedback for the proposal on 28 February 2014. An additional consultation letter was issued to the council on 5 November 2015. Matters raised by council are considered at Table 5-3.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Details</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Sydney Council</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage</td>
<td>• No heritage concerns raised provided that all recommendations within the Statement of Heritage Impact (Appendix C) are included as management measures.</td>
<td>• All recommendations of the Statement of Heritage Impact have been included within the management measures outlined at Section 6.9.3 and 7.2.</td>
</tr>
</tbody>
</table>
| Engineering comments | • Extent of landside site area, barriers, road safety and pedestrian safety is to be negotiated with council  
• A traffic management plan is to be prepared and agreed to by council  
• Worker parking is to be agreed with council prior to work commencing  
• Reconstruction of council asset is to be agreed prior to the works commencing  
• The proposed works should be entirely independent of the seawall and should permit convenient access for inspection and future repairs  
• The use of council land to host any connection to services should be agreed with council prior to works commencing. | • Extent of landside site compound area, barriers, road safety and pedestrian safety would be developed in consultation with council  
• A traffic management plan is to be prepared with a copy provided to council prior to construction  
• The location of worker parking will be identified in consultation with council prior to work commencing  
• The reconstruction of council assets will be developed in consultation with council prior to the works commencing  
• All wharf structures will be independent of the existing sea wall  
• The use of council land to host any connection to services where relevant is to be developed in consultation with council  
• Management measures are outlined at Section 6.1.3, 6.6.3, and 7.2 and 7.3. |
| Community consultation | • Community notification details should be provided to council. | • North Sydney Council will be included in all regular community consultation and community information provided during the construction period  
• Project contact information will be displayed prominently on the construction site compound. |
5.4 SREP (Sydney Harbour Catchment) 2005 consultation

The SREP Sydney Harbour provides requirements for the notification of certain proposals. Clause 31 applies to development which is listed in Schedule 2 and development that requires the provision of services (including water, sewerage or stormwater systems). Clause 31 requires the following:

- Under the provisions of the SREP, FW PDAC is required to be notified on proposed developments of a kind listed in Schedule 2 to the SREP. In the case of development that requires the provision of services, the public authority responsible for providing the service concerned is also required to be notified.
- The FW PDAC, Ausgrid and Sydney Water were consulted via formal correspondence on 5 November 2015 in accordance with clause 31. Table 5-4 details the comments received from this notification and how any issues raised have been addressed.

Table 5-4 Issues raised through SREP (Sydney Harbour Catchment) consultation

<table>
<thead>
<tr>
<th>Agency</th>
<th>Details</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW PDAC</td>
<td>• No objections to the proposal</td>
<td>• Proposal has been considered against all relevant matters of the SREP Sydney Harbour. Refer to Section 4.1.2 and 4.1.3.</td>
</tr>
<tr>
<td></td>
<td>• The Committee recommends that the consent authority take into consideration the relevant matters as prescribed in the SREP and the Sydney Harbour Foreshores and Waterways Area DCP for SREP Sydney Harbour.</td>
<td></td>
</tr>
<tr>
<td>Ausgrid</td>
<td>• No objections to the proposal</td>
<td>• Ausgrid would be consulted during construction and where necessary applications for connections would be made. Safeguards have been included at Chapter 7.</td>
</tr>
<tr>
<td></td>
<td>• Along with dial before you dig surveys, the contracting services are aware of the Ausgrid information booklet: Working near Ausgrid Cables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• An application for connection is required to be submitted prior to the installation of the new electrical equipment.</td>
<td></td>
</tr>
<tr>
<td>Sydney Water</td>
<td>• No objections to the proposal</td>
<td>• N/A. Sydney Water would be consulted during construction and where necessary applications for connections would be made. Safeguards have been included at Chapter 7.</td>
</tr>
</tbody>
</table>

5.5 Government agency and stakeholder involvement

Various government agencies and stakeholders were notified by letter on the 5 November 2015, including:

- North Sydney Council.
- Sydney Ferries.
- Foreshore and Waterways Planning and Development Advisory Committee (FWPDAC).
- Department of Primary Industries (DPI) (Fisheries).
- Port Authority of NSW.

Issues that have been raised as a result of consultation with these agencies are outlined below in Table 5-5.

**Table 5-5** Issues raised through stakeholder consultation

<table>
<thead>
<tr>
<th>Agency</th>
<th>Details</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
</table>
| North Sydney Council          | • No particular heritage concerns are raised provided that all recommendations within the Statement of Heritage Impact (Appendix C) are included as management measures  
• Extent of landside site area, barriers, road safety and pedestrian safety is to be negotiated with council  
• A traffic management plan is to be prepared and agreed to by council  
• Worker parking is to be agreed with council prior to work commencing  
• Reconstruction of council asset is to be agreed prior to the works commencing  
• The proposed works should be entirely independent of the seawall and should permit convenient access for inspection and future repairs  
• The use of council land to host any connection to services should be agreed with council prior to works commencing.                                                                                                     | • North Sydney Council and the local community would be kept informed about the details of the works, construction progress and other impacts during the construction period as detailed in Section 5.6. Refer to Section 3.2, 6.1 and 6.9.                                      |
<p>| Sydney Ferries                | • No response received.                                                                                                                                                                                                                                                                                                                  | • N/A.                                                                                                                                                                                                                                                                                              |</p>
<table>
<thead>
<tr>
<th>Agency</th>
<th>Details</th>
<th>Response/Where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW PDAC</td>
<td>• No objections to the proposal</td>
<td>• The proposal has been considered against all relevant matters of the SREP Sydney Harbour (refer to Section 4.1.2 and 4.1.3).</td>
</tr>
<tr>
<td></td>
<td>• The Committee recommends that the consent authority take into consideration the relevant matters as prescribed in the SREP and the Sydney Harbour Foreshores and Waterways Area DCP for SREP Sydney Harbour.</td>
<td></td>
</tr>
<tr>
<td>DPI (Fisheries)</td>
<td>• A permit or formal notification under the FM Act is not required for this proposal</td>
<td>• DPI confirmed that that there is no requirement for a permit or formal notification under the FM Act for this proposal. Safeguards to manage waste and turbidity are proposed at Section 6.1.3 and 6.3.1.</td>
</tr>
<tr>
<td></td>
<td>• Material removed is deposited appropriately on land and that silt curtains are used during construction to mitigate turbidity.</td>
<td></td>
</tr>
<tr>
<td>Port Authority of NSW</td>
<td>• Permission granted for disturbance of bed of a special port.</td>
<td>• The Deputy Harbour Master has provided written permission to proceed with the proposal, subject to a number of conditions. These conditions are included as a safeguard at Section 6.7.3.</td>
</tr>
</tbody>
</table>

### 5.6 Ongoing or future consultation

If the proposal proceeds, as part of the communications plan for the proposal, the following activities would be undertaken in the lead up to and throughout the work. These activities would ensure that the community is fully informed about the proposal.

- Public display of Review of Environmental Factors
- On site signage would be installed to provide information about the wharf closure, the construction work, contact details and alternative transport arrangements
- A contact number would be provided for the community to register any comments or complaints during construction of the proposal
- All consultation activities detailed at Section 5.1 that are yet to be carried out.
6 Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in the guidelines Marinas and Related Facilities (DUAP 1996) and Is an EIS required? (DUAP 1999) as required under clause 228(1)(a) and (b) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix B. Site-specific safeguards are provided to minimise the identified potential impacts.

6.1 Land surface

6.1.1 Existing environment

Land based

McMahons Point is located on the northern shore of Sydney Harbour, opposite Walsh Bay and the Sydney CBD. At the southern edge of McMahons Point is Blues Point Reserve and a single residence located on the southern side of Henry Lawson Avenue. A paved pedestrian path links the McMahons Point Interchange at the eastern end of Blues Point Reserve to the western end of the reserve. Within the vicinity of the interchange, the reserve comprises a narrow grassed strip between Henry Lawson Avenue and Sydney Harbour with minimal landside infrastructure (refer to Section 2.2) and a small garden bed with low growing garden species. There are no trees within this area.

Historically, land uses within the vicinity of the wharf have generally been for residential and open space purposes. This is also the current situation except that a restaurant is located directly to the north of the wharf.

A search of the NSW Environment Protection Authority’s contaminated land register undertaken on 7 May 2015 did not identify any existing notices of contaminated land within the vicinity of the site. Surrounding land uses include public open space, commercial and residential properties. These land uses are not anticipated to generate contaminated land that is a concern to the proposal.

Mapping for the area indicates that the land within the vicinity of the wharf has a high probability of containing acid sulfate soils (NSW Government 2015).

Land directly adjoining the proposed wharf has a very low susceptibility to erosion due to the retainment of the land by concrete and rocks.

Water based

A rock rubble reef extends offshore by about eight to 10 metres from the seawall to about 4 metres below the lowest astronomical tide (LAT). A sandy seabed grading to silty sand extends from the rock rubble reef into deeper water with some isolated rocks. Other surface areas within the water comprise sub tidal areas of the wharf structure such as the wharf support piles. These elements provide aquatic habitat for a variety of marine species.

Previous studies indicate that parts of Sydney Harbour have the potential for sediments to contain contaminants, particularly closed areas of the harbour, and areas where there is a history of industries on or near the water. McMahons Point Wharf is situated within an open section of the harbour. Marine sediments in the vicinity of the wharf are disturbed by the operation of vessels at the wharf, tide and wave action. Historically, the area has not been developed for industry. Therefore, it is unlikely that sediments would contain contaminants.

No swing moorings, jetties and/or other vessel berthing structures are located within the direct vicinity of the proposal area.
Potential acid sulfate soils (ASS) may occur within the soils of the harbour floor. No electrical services are located within the surrounding area of the proposal, although three 33,000 volt submarine cables are buried within the waterway at the eastern point of Henry Lawson Avenue.

6.1.2 Potential impacts

Construction Impacts

Land based

Land based activities would include:

- Installation of a temporary compound during construction
- The removal and reinstatement of the top level of sandstone blocks from the seawall at the entrance to the wharf to allow construction of the new shelter. The footpath would be raised by about 75 millimetres and would match the width of the entrance to the proposed wharf interchange
- Minor realignment to the kerb and gutter adjacent to Sails on Lavender Bay restaurant and around the turning circle at Henry Lawson Avenue to improve both vehicle and pedestrian access at the wharf interchange (refer to Figure 3-1)
- Construction of new or improved facilities including:
  - Replacement of the existing bus stop at Henry Lawson Avenue
  - New electronic ticketing machines located at the wharf
  - Installation of bicycle racks adjacent to the wharf
  - Installation of way-finding signage.

Given the location of the works adjacent to Sydney Harbour, there is potential for exposed soils to be eroded by wind or rain, or polluted by accidental spills or leakages from plant and equipment. This could potentially occur during demolition of kerb and gutter works and disturbance of earth materials. Risk of erosion would be low considering the land is generally flat within the vicinity of the wharf and there would be limited excavation exposing soils in the proposal area. Excavated material would be reused to rehabilitate the site back to pre-work conditions where feasible. The potential impacts would be temporary and localised.

There is potential that the proposal may disturb ASS during the landside works. To minimise impacts, disturbed soils would be checked for potential ASS. Any ASS would be removed, contained and disposed of in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (DECCW 2009).

As outlined at Section 5.3, council have raised concern about the extent of the landside site area, reconstruction of council assets, connection of services, and integration of the design of the proposal with the seawall. To resolve these concerns, council have requested that these matters be developed in consultation with council prior to the commencement of work. This has been included as a management measure at Section 6.1.3.

Water based

The majority of the proposed works are to be undertaken within the waterway and below the mean high water mark. The removal of the existing piles, installation of new piles, and anchoring of barges would have the potential to destabilise marine sediments, causing turbidity. Turbidity may cause a short term reduction in light penetration through the water column in the immediate area around the piling work area. Subsequent sedimentation may cause a localised change in the particle size distribution of sediment on the seafloor. The duration and scale of the impacts would be minor given the size of Sydney Harbour as well as the fact that the impacts would be confined to bottom waters and particles would settle rapidly. It should also be noted that apart from rocky reef, the seabed within the vicinity of the wharf is predominantly loose sand, which is susceptible to occasional
mobilisation from pre-existing conditions such as vessel movements, waves, tides and stormwater release.

The proposal may potentially disturb ASS during the removal of piles. To minimise impacts, piles that have been removed would be checked for debris and any potential ASS would be removed, contained and disposed of in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (DECCW 2009c).

The seafloor would not be considerably altered as a result of the removal or installation of new piles or by the anchors of construction vessels, although harbour bed rocks and sediments would be disturbed by the work.

The proposal does not involve any dredging, filling or excavation works below the mean high water mark.

Safeguards and mitigation measures to minimise disturbance of sediments during piling works and sediment control during landside upgrade works are identified in Section 6.1.3.

**Operation Impacts**

The proposal would cater for Sydney Ferry operations. Recreational vessels and water taxis would also use the proposed wharf interchange.

The new bridge, gangway and pontoon would be located further offshore and to the east/south east of the existing wharf. Water levels at the berthing faces at the new pontoon would be deeper, and the impacts of sediment movement and scouring as well as the size of the affected area would potentially be reduced. This would be a long term benefit of the proposal. No dredging for ferry access would be required.

The floating pontoon, bridge and gangway would reduce local wave attenuation and potentially offset waves generated by ferries. This would potentially improve seawall stability. The reduction in the number of piles to four would also potentially improve sediment accumulation and movement.

### 6.1.3 Safeguards and management measures

**Table 6-1** Land surface Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water based land surface</td>
<td>• Silt and sediment controls will be established prior to any disturbance of the land surface. Controls will be in accordance with edition 4 of ‘Managing Urban Stormwater, Soils and Construction’ (NSW Government, 2004) (the blue book).</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
</tr>
<tr>
<td>--------------------------------</td>
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</tr>
</tbody>
</table>
| Water based land surface       | • A silt curtain, extending from a minimum of 100 millimetres above the water line and extending no less than 2.5 metres below sea level will be installed around the entire proposal area at McMahons Point prior to commencement of works that disturb the seafloor  
  • If excessive turbidity of the water is observed during removal of the first few piles, a second, moveable silt curtain will be installed around the piles being removed during each day of operation. | Project manager      | Pre-construction and construction |
| Water based land surface       | • During removal of the existing wharf, an additional silt curtain, extending from a minimum of 100 millimetres above the water line and extending to the seabed (or extending no less than 2.5 metres below sea level) will be set parallel to the east facing seawall at the demolition site. This will be set at about two metres below the lowest astronomical tide (LAT) contour  
  • This silt curtain will extend under the existing ferry wharf footprint and for about 20 metres parallel to the shore from the extremities of the existing wharf  
  • This silt curtain will be removed prior to the removal of the remaining inshore piles and the remaining inshore piles will be removed about high tide. | Project manager      | Construction            |
<table>
<thead>
<tr>
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<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| Water based land surface | • Visual observations of the effectiveness of the silt curtain are required to be made at least twice each day  
  • Results of observations of the integrity of the silt curtain are required to be recorded in a site notebook maintained specifically for the purpose. The notebook is required to be kept on the site and to be available for inspection by persons authorised by Roads and Maritime  
  • Works will be carried out to minimise the disturbance of seafloor sediment such as working at high tide. | Project manager | Construction      |
| Water based land surface | • An acid sulfate soil management plan will be prepared and implemented in the event that acid sulfate soil is exposed to the atmosphere as a result of removing the piles and preparatory work for the pathway upgrade. This will include:  
  • Checking landside soils and piles for potential acid sulfate soils on removal of piles from water  
  • Carrying out pH and peroxide tests, as relevant, to detect the presence of any potential acid sulfate soils on soils in areas of excavation on the land prior to start of works  
  • Removing, containing, and disposing of potential acid sulphate soils in Waste Classification Guidelines: Part 1 Classifying Waste (DECCW 2009). | Project manager | Pre-construction and construction |
<p>| Land surface         | • Following removal of the temporary compound the area will be restored with all land surfaces rehabilitated.                                                                                                           | Project manager | Construction      |
| Land surface         | • All of the ‘land surface’ environmental control measures listed are to be implemented during establishment of the temporary compound and will be set out in the CEMP.                                                      | Project manager | Pre-construction  |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land surface</td>
<td>• Trees located within the vicinity of the temporary compound will be protected by tree protection fencing for the duration of construction.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Land surface</td>
<td>• The following matters will be developed in consultation with council prior to work commencing:</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>• Extent of landside site compound area, barriers, road safety and pedestrian safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reconstruction of council assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The use of council land to host any connection to services where relevant.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land surface</td>
<td>• All wharf structures are to be independent of the existing sea wall. Any changes to the proposed works which could result in additional environmental impacts to the sea wall would be the subject of additional environmental assessment.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
</tbody>
</table>

Additional safeguards and management measures addressing water quality impacts are identified at Section 6.3.3.

### 6.2 Hydrological issues

#### 6.2.1 Existing environment

**Existing drainage**

Stormwater drainage within the vicinity of the site flows from roadside kerb and guttering into an underground pipe system before discharging into the Sydney Harbour. The nearest stormwater drain and associated discharge point are located about 20 metres to the south of the existing wharf shelter at Henry Lawson Avenue.

Run-off from the wharf drains directly into Sydney Harbour from the existing structure.

**Tides**

The proposal is located on the northern side of Port Jackson. Water levels of Port Jackson are subject to ocean tides and the site has similar tides to Fort Denison, that is:

- Tides are semi-diurnal meaning that two high and two low tides normally occur each day
- The mean high water mark would be at about 1.5 metres above the zero of the Fort Denison Tide Gauge (ZFDTG) (which is at about 0.5 metres AHD)
- The 50 year average recurrence interval (ARI) tide level would be about 2.4 metres ZFDTG.
- The minimum tide level being at about zero metres ZFDTG.
The mean spring tide at Fort Denison is about 1.2 metres and the mean neap tide is 0.7 metres.

**Currents**

Due to the deep and open nature of Sydney Harbour and Port Jackson, tidal currents are minor. The mean spring and neap tides stated above translate to a maximum current of 0.5 knots or less (0.3 metres per second). Wind shear on the water surface generates the strongest currents in the location of the proposal.

**Waves**

Waves are propagated when wind passes over the surface of the water creating friction. This friction creates sheer stress causing the growth of waves. The wave height is in response to the wind speed, water depth and topography of the ocean floor.

The closest Bureau of Meteorology (BOM) monitoring station to the proposal is located at Observatory Hill. Data recorded at Observatory Hill indicates that winds exhibit seasonal and diurnal variations. Prevailing winds are south and east during the summer months and west and south-west during the winter months. Calmer winds are experienced in the mornings (BOM 2015).

Due to the openness of Port Jackson in the vicinity of the wharf, and long fetches to the south west (about 1.4 kilometres), south (about 770 metres), and south east (about 4.5 kilometres), it is expected that waves of varying heights would be experienced at McMahons Point Wharf, particularly as the wind speed increases throughout the day (based on mean 9am and 3pm wind speed observations).

Waves at McMahons Point are also influenced by boat wash from this highly trafficked section of the harbour adjacent to the wharf. Vessel traffic within the harbour is generally busiest between the hours of 7am and 7pm.

**Water levels**

Water levels are determined by astronomical tides, storm surges, and oceanic swells. There is little in the way of oceanic swells in this section of Port Jackson as it is protected by the many headlands within Sydney Harbour to the east of the site.

**Flooding**

McMahons Point Wharf is not known to be affected by stormwater surges or flooding.

---

6.2.2 Potential impacts

**Construction impacts**

By virtue of the openness of the site to Sydney Harbour, there are unlikely to be any significant changes to tidal flow, currents, wave action or water quality arising from the proposal.

The use of floating barges may have a minor localised reduction in wave energy in the inshore area. This impact would be temporary and contained in the area where the barges are anchored.

Waves experienced during the construction period may result in a safety risk during piling activities and intricate lifts. These activities would be undertaken during calm water conditions, where possible.

There would be minimal changes to the landside drainage during the construction of the proposal. Safeguards have been included at Section 6.2.3 to minimise impacts in the unlikely event of a flood occurring at the site.

**Operational impacts**

The pontoon would float on top of the water while being held in place by four piles. The floating pontoon would largely move up and down with the tide level so not to inhibit existing water movement patterns. The bridge and gangway would be supported by the new covered shelter and new uncovered floating pontoon above the water level, allowing existing water movement patterns
to continue beneath.

There would be a reduction in wave energy in the inshore area due to the operation of the wharf interchange. The impact would be relative to the size of the pontoon and the location of the berthing area further away from the shoreline. This impact would be minor given the connectivity of wave generation adjacent to the proposal.

The operation of the proposal would also result in minor changes in stormwater discharge as a result of the minor increase in the roofed area of the proposal, relative to the existing shelter. This would have an insignificant impact on water quality due to the relatively small increase in surface area and the discharge of stormwater directly into the harbour. There would be minimal changes to the landside drainage as a result of the proposal.

Consideration of sea level rise is discussed at Section 6.15.

6.2.3 Safeguards and management measures

Table 6-2 Hydrological safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrology</td>
<td>• Weather forecasts will be checked regularly during construction and where flooding is forecast, all equipment and materials will be removed from the compound site and wharf construction area or appropriately secured.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>

6.3 Water quality

6.3.1 Existing environment

McMahon’s Point has been developed for mostly residential and open space purposes. Water quality within the harbour in the vicinity of the site is largely influenced by point source water pollution such as stormwater drainage outlets and diffuse water pollution such as urban runoff. Boat effluent and anti-fouling paints may also contribute to existing water quality impacts within the harbour.

Stormwater and urban runoff pollutants commonly include:

- Sediments (eg soil erosion)
- Pathogens (eg bacteria from leaking septic tanks)
- Gross pollutants (eg litter)
- Toxicants (eg pesticides, accidental spills or deliberate dumping).
- Nutrients (eg due to sewage overflow, fertilizers, detergents and animal faeces).
- Oils and lubricants from road and boat based pollutants.
- Organic matter (eg leaf litter).

Stormwater drainage infrastructure from the road network within the McMahons Point area discharges directly into the harbour. It is also understood that no stormwater filtration beds or stormwater treatment devices (eg gross pollutant traps) exist in the area to improve stormwater quality prior to direct discharge into the harbour. Some of these discharge points are located at the southern end of McMahons Point and within Lavender Bay. Water quality at the site would
potentially be affected during periods of heavy rainfall and increased runoff. Similarly, stormwater discharge from Milsons Point may also affect water quality at the site.

Office of Environment and Heritage (OEH) measures recreational water quality at Sydney Harbour and the surrounding Sydney beaches through the Harbourwatch and Beachwatch programs respectively. Rainfall data is used to predict the likelihood of bacterial contamination at sample sites. The risk of bacterial contamination increases following periods of rainfall. Samples have been taken at various locations in the harbour, however none at McMahons Point. The closest monitoring sites to McMahons Point are located at Greenwich Baths and Hayes Street Beach. Both indicate that the annual water quality is good and deteriorates during/following wet weather (OEH 2015).

The waters in the vicinity of the site are used by a variety of vessels, which create propeller wash, anchor on the harbour bed, and have the potential for accidental spills or leaking of hydrocarbons. These are recurring issues for the existing water quality within the waters surrounding the proposal and the harbour in general.

### 6.3.2 Potential impacts

#### Construction impacts

The removal of existing piles and installation of new piles has the potential to destabilise marine sediments and increase turbidity in the water. As noted previously, turbidity may cause a short term reduction in light penetration through the water column in the immediate area around the piling work area.

All piling works would be done from a crane positioned on top of a barge. Accidental spills or discharges during construction works would be a risk to water quality. Spills could occur at the construction site or on route to or from the off-site facility.

Barges and construction plant would be refuelled at an appropriately approved and licensed refuelling depot prior to accessing the site. However, the barge may also leak hydraulic oil or fuel into the water and cause localised contamination. Hydrocarbons may condense and become suspended in the water column or degrade and be released into the atmosphere.

During landside works (ie kerb and gutter realignment works), exposed surfaces potentially containing acid sulfate soils may be eroded into nearby stormwater inlets or directly into the harbour. This would cause potential sedimentation and/or water contamination. If field investigations detect the presence of acid sulfate soils the safeguards at Section 6.3.3 would be implemented. The potential impact would be temporary and localised.

A temporary compound located at the water’s edge has the potential to spill chemicals, and leak oils or lubricants into directly into the harbour. This potential risk is considered to be low as there would be no oils, fuels, chemicals, other hazardous substances, plant or equipment stored at the temporary compound.

Barges may also leak hydraulic oil or fuel into the water and cause localised contamination. Hydrocarbons may condense and become suspended in the water column or degrade and be released into the atmosphere.

Barges and construction plant would be refuelled at an appropriately approved and licensed refuelling depot prior to accessing the site.

Trucks and light vehicles using the study area have the potential to leak oils, fuels or lubricants and discharge into the stormwater drainage.

#### Operation impacts

Operation of the McMahons Point Wharf interchange may result in water quality impacts from general litter generated by wharf users or from spill incidents involving a ferry or another vessel using the pontoon. These are existing impacts and apart from the potential for increased recreational fishing activities from the pontoon due to an additional berthing face, impacts are not
expected to increase in frequency or magnitude as a result of the proposal. Bins would be provided to discourage littering at the site.

The new pontoon would be located further offshore south east of the current wharf. The location of the berthing faces within deeper water would reduce the likelihood of an incident arising from vessels hitting the seafloor and resulting in a spill. The location within deeper water may also reduce sediment movement and scouring and the size of the affected area within the bay. These would have a potential long term beneficial impact.

The operation of the proposal would result in a minor change in stormwater discharges as a result of the minor increase in the roofed area of the proposed compared with the existing shelter. This would have a minimal impact on water quality due to the relatively small increase in surface area of the roof. Stormwater from the new shelter would discharge directly into the harbour.

### 6.3.3 Safeguards and management measures

**Table 6-3 Water quality safeguards and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality</td>
<td>Weather forecasts will be checked regularly during construction and where flooding is forecast, all equipment and materials will be removed from the compound site and wharf construction area or appropriately secured.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>Erosion and sediment measures would be checked prior to forecasted rainfall and following periods of rainfall.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| Water quality   | Emergency spill kits will be kept on-site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site. A spill kit will be kept on each barge and at the temporary compound site  

  All staff will be made aware of the location of the spill kits and trained in their use  

  If a spill occurs, the Roads and Maritime contract manager will be notified as soon as practicable and the Roads and Maritime Incident Procedure will be followed. | Project manager         | Construction |
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality</td>
<td>Equipment barges carrying plant or machinery will be fitted with bunding around equipment which contain chemicals to prevent chemical spills or leakages from entering the water.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>Any chemicals or fuels stored at the temporary compound will be within double bunded areas.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>All equipment, materials and wastes transported between an appropriately approved and licensed facility, and the construction work site will be secured to avoid spills during transportation.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>Vehicles, vessels and plant will be properly maintained and regularly inspected for fluid leaks.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>No vehicle or vessel will be washed down or refuelled while on-site.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>Emergency contacts will be kept in an easily accessible location on the construction work site and on all construction vessels. All construction workers will be advised of these contact details and procedures.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Water quality</td>
<td>In an event of a spill during operation, the incident emergency plan will be implemented in accordance with Sydney Ports Corporation’s response to shipping incidents and emergencies outlined in the ‘NSW State Waters Marine Oil and Chemical Spill Contingency Plan’ (Maritime, 2008).</td>
<td>Project manager</td>
<td>Operations</td>
</tr>
</tbody>
</table>

Additional safeguards and management measures that would address both water quality and land surface impacts are identified at Section 6.1.3.

### 6.4 Noise and vibration

A noise and vibration impact assessment was undertaken for the proposal by Acoustic Logic. The full report is provided in Appendix D and a summary of the report is provided below.
6.4.1 Methodology
The noise and vibration impact assessment was prepared in accordance with the following:

- Interim Construction Noise Guideline (ICNG) (DECCW, 2009b).

6.4.2 Existing environment
The nearest noise sensitive receivers to McMahons Point Wharf are shown at Figure 6-1 and include:

- Receiver 1 – residences at 2 Henry Lawson Avenue, McMahons Point, located about 33 metres to the west of the proposed wharf construction and about 15 metres to the north of the proposed road works.
- Receiver 2 – residences at 2A Henry Lawson Avenue, McMahons Point, located about 90 metres to the north west of the proposed wharf construction and road works.
- Receiver 3 - residences at 2A Glen Street, Milsons Point, located about 380 metres to the east of the proposed wharf construction and road works.
- Receiver 4 – commercial premises at Sails on Lavender Bay, McMahons Point located about five metres to the north of the proposed wharf construction and about three metres to the north of the proposed road works.

Unattended noise monitoring to determine existing background noise levels at the site was carried out adjacent to the turning circle at Henry Lawson Avenue, as shown at Figure 6-1.

Monitoring results were used to establish the average background noise levels (known as the rating background levels (RBL) at the site for day, evening and night time periods, are provided at Table 6-4.

Table 6-4 Background noise levels for day, evening and night time periods

<table>
<thead>
<tr>
<th>Location</th>
<th>Background noise level – dB(A) (LA_{90} (15 mins))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daytime (7am – 6pm)</td>
</tr>
<tr>
<td>Henry Lawson Avenue</td>
<td>49</td>
</tr>
</tbody>
</table>

Recorded noise levels show typical trends where levels are at their highest during the day time period. Background noise levels during the day time are typically dominated by general vehicular traffic movements on surrounding roadways and watercraft on the harbour.
Figure 6-1 Proximity of nearest sensitive receivers to the proposal
6.4.3 Criteria

Construction noise criteria

The ICNG provides noise management levels for construction activities. Noise management levels differ depending on the type of sensitive receiver that may be affected and the time of day that the activity is being carried out.

The ICNG provides that, for residential receivers, construction noise levels should be managed with the aim of not exceeding the noise affected level, which is the RBL plus 10dB(A) during standard working hours or the RBL plus 5dB(A) outside of standard working hours (refer to Table 6-5). Where construction noise is predicted to exceed the noise affected level, all reasonable and feasible mitigation measures should be applied. The highly noise affected level is 75dB(A). Where construction noise is predicted to reach this level, respite periods for very noisy activities may be required.

Table 6-5 Noise management levels for residences for airborne noise

<table>
<thead>
<tr>
<th>Time of day</th>
<th>Noise management level (LA_{eq}(15\text{ mins})</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended standard hours</td>
<td>Noise affected</td>
<td>RBL + 10dB(A)</td>
</tr>
<tr>
<td>Monday – Friday: 7am to 6pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday: 8am to 1pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No work on Sundays or public holidays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside recommended standard hours</td>
<td>Noise affected</td>
<td>RBL + 5dB(A)</td>
</tr>
</tbody>
</table>

As discussed at Section 3.3.2 construction activities would normally be restricted to standard working hours. However, work outside of standard hours would be required for piling activities and intricate lifts from the barge mounted crane. These activities require calm or very calm water conditions which are typically experienced during the night time and early morning periods with wind chop and wind increasing throughout the day. To ensure the safety of construction workers, effective operation, and to avoid future noise and maintenance issues which can be caused by incorrect alignment during pile installation, these activities are anticipated to be carried out generally during the night time period (11pm to 7am) as detailed in Section 3.3.2.

The noise management levels for the proposal corresponding to the nearest sensitive receiver are detailed in Table 6-6.

Table 6-6 Noise management levels

<table>
<thead>
<tr>
<th>Receiver location</th>
<th>Receiver type</th>
<th>Noise management level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 Henry Lawson Avenue</td>
<td>Day: 59/75* Evening: 52</td>
</tr>
<tr>
<td></td>
<td>(Residential)</td>
<td></td>
</tr>
</tbody>
</table>
In addition to the noise management levels, where construction would be required during the night time period, the potential for sleep disturbance would also be applied. The ICNG states that where works are planned over two consecutive nights the maximum noise levels should be applied. OEH’s approach is to apply an initial screening criterion of RBL plus 15 dB(A) and to undertake further analysis if the initial screening criteria cannot be met. This analysis may include consideration of the number of potential sleep disturbance events during the night, the level of exceedance and the noise levels from other events.

**Vibration**

Vibration targets vary depending on whether the particular activities of interest are continuous, impulsive or intermittent and whether they occur during the day or night. The effects of vibration can be divided into two main groups:

- Structural damage of buildings
- Human comfort, where the occupants or users of buildings are inconvenienced or disturbed by vibration.

Criteria relevant to the response of building occupants to vibration (i.e. human comfort) are more stringent than those relevant to building damage. The standards used to determine criteria for vibration are identified in Table 6-7.

**Table 6-7** Standards used for assessing construction vibration

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural damage</td>
<td>German Standard DIN 4150-3 (1992-02): Structural vibration – Effects of vibration on structures (the German Standard DIN 4150-3)</td>
</tr>
<tr>
<td>Human comfort</td>
<td>British Standard 6472: 1992 – Guide to evaluation of human exposure to vibration in buildings (1Hz to 80Hz)</td>
</tr>
</tbody>
</table>

Based on the above standards, the adopted vibration goal for the proposal is a peak particle velocity of 10 mm/s at all receivers.

---

**Receiver** | **Receiver type**                  | **Noise management level** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2A Henry Lawson Avenue (Residential)</td>
<td>59/75*</td>
</tr>
<tr>
<td>3</td>
<td>2A Glen Street, Milson Point (Residential)</td>
<td>59/75*</td>
</tr>
<tr>
<td>4</td>
<td>Sails on Lavender Bay restaurant (Commercial)</td>
<td>70*</td>
</tr>
</tbody>
</table>

*Note 75dB(A) is the recommended maximum noise management level at residential receivers*)

Standard daytime construction hours: 7am to 6pm Monday to Friday and 8am to 1pm on Saturday; Evening period 6pm to 10pm; Night time period 10pm to 7am except on Sunday morning when night time period is extended to 8am.
6.4.4 Potential impacts

Construction – Noise

Potential noise impacts have been minimised through the design of the proposal which involves undertaking as much construction work as possible at contractors off-site facility rather than at site, including assemblage of pre-fabricated components.

To assess the potential noise and vibration impacts from the proposal, four scenarios were used to undertake the assessment. These scenarios and the equipment to be used for each are outlined in Table 6-8. The construction scenarios are intended to be conservative and should be considered to be at the upper end of the expected noise level range (e.g. these scenarios have not taken into account absorption of noise by the environment as it travels across the land or water, structures between the source of noise and the receiver that would reduce noise and any of the noise safeguards or management measures proposed at Section 6.4.5).

Table 6-8 Construction scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Equipment to be used</th>
<th>Items of plant required</th>
<th>Period of operation in any 15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Removal of the existing pontoon and gangway</td>
<td>Barge</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Truck</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand tools</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydraulic hammer</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Angle grinders</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Lifting of materials</td>
<td>Barge</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crane</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand tools</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Installation of new piles</td>
<td>Barge</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Piling rig</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crane</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>General construction</td>
<td>Barge</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Scenario</td>
<td>Description</td>
<td>Equipment to be used</td>
<td>Items of plant required</td>
<td>Period of operation in any 15 minutes</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>----------------------</td>
<td>-------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td>works</td>
<td>Concrete truck</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete pump</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Truck</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boat</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand Tool</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generator</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>General construction works associated with roadside works</td>
<td>Truck</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand tools</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydraulic hammers</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Angle grinders</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Truck</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete truck</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete pump</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Truck</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand tools</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generator</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>
Noise levels from each piece of equipment/process to be used during construction have been predicted for both day and night time periods at the nearest residential receivers located at Henry Lawson Avenue. The results are summarised below and presented in detail at Appendix D.

**Construction predictions during standard construction hours**

Table 6-9 displays the highest predicted noise level at receivers 1 and 2 for the piece of equipment/activity predicted to have the highest noise level for each of the scenarios for works carried out within standard construction hours.

Exceedances of up to 23 dB(A) are identified during piling activities at 2 Henry Lawson Avenue, and up to 26dB(A) at Sails on Lavender Bay. Prior to construction (at least two weeks prior) reasonable noise management measures during lunch service will be required to be identified. This may include respite periods for high noise generating activities including the following activities:

- Piling
- Use of the crane
- Hand held grinders, hammering and saws without screening at Sails on Lavender Bay restaurant.

Figure 6-2, identifies the properties where it is expected that noise management levels would be exceeded (properties located within the red outline) and properties that would be highly noise affected (properties located within the yellow outline).

Highly noise affected refers to noise levels above 75 dB(A). Other residential receivers would also be affected by noise, however impacts on receivers outside of the defined areas at Figure 6-2 would reduce as the distance from the site to the receiver increases. Prior to construction, the community within these defined areas (refer to Figure 6-2) would be notified of potential noise impacts during construction.

**Table 6-9 Construction noise predictions for noisiest activities during standard construction hours**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Receiver location</th>
<th>Predicated noise level (dB(A))</th>
<th>Noise management level (dB(A))</th>
<th>LAeq (15min) dB(A) exceedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Removal of existing McMahon's Point Wharf</td>
<td>1</td>
<td>72</td>
<td>59</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>76</td>
<td>59</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>66</td>
<td>59</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>70</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Lifting of</td>
<td>1</td>
<td>59</td>
<td>59</td>
<td>-</td>
</tr>
<tr>
<td>Scenario</td>
<td>Description</td>
<td>Receiver location</td>
<td>Predicated noise level (dB(A))</td>
<td>Noise management level (dB(A))</td>
<td>LAeq (15min) dB(A) exceedance</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------</td>
<td>-------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>materials</td>
<td>2</td>
<td>63</td>
<td>59</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>53</td>
<td>59</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>83</td>
<td>70</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Installation of new pipes</td>
<td>1</td>
<td>73</td>
<td>59</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>77</td>
<td>59</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>53</td>
<td>59</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>93</td>
<td>70</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>General construction works</td>
<td>1</td>
<td>72</td>
<td>59</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>76</td>
<td>59</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>66</td>
<td>59</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>96</td>
<td>70</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>General construction works associated with roadside works</td>
<td>1</td>
<td>72</td>
<td>59</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>76</td>
<td>59</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>66</td>
<td>59</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>96</td>
<td>70</td>
<td>26</td>
</tr>
</tbody>
</table>
Figure 6-2 Residences where noise management levels may be exceeded (those properties within the red line) and residences that may be highly noise affected (those properties within the yellow line)

Construction predictions during night time periods

Table 6-10 displays the highest predicted noise level at receiver 2 for the equipment/activity predicted to have the highest noise level for each of the scenarios for works outside standard construction hours (the night time period between 11pm and 7am). An exceedance of 40 dB(A) is identified during the hammering of piles (between 5am and 7am) for the nearest residential receiver and 37 dB(A) during lifting activities. Other residential receivers would also be affected by noise however impacts on these receivers would reduce as the distance to the receiver increases.

Construction during the evening period has not been included as there would only be minor works between the hours of 6pm and 10pm at the early stage of construction.

Table 6-10 Construction noise predictions at nearest residential receiver during the proposed night time construction hours (11pm – 7am)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Receiver location</th>
<th>Predicated noise level (dB(A))</th>
<th>Noise management level (dB(A))</th>
<th>L_Aeq (15min) dB(A) exceedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Removal of the existing pontoon and gangway</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Lifting of materials</td>
<td>1</td>
<td>73*</td>
<td>45</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Installation of new pipe</td>
<td>1</td>
<td>82*</td>
<td>45</td>
<td>37</td>
</tr>
</tbody>
</table>
Construction – sleep disturbance

An assessment of the maximum noise levels was carried out to determine potential sleep disturbance from intricate lifts during the night (scheduled between 11pm to 7am) and piling works (scheduled generally between 11pm and 7am). The assessment indicated that there would be exceedances of up to 23 dB(A) of OEH's sleep disturbance screening criteria between 11pm and 7am during intricate lifts and 44 dB(A) between 5am and 7am during hammering of piles.

The ICNG states that where the screening criteria have been exceeded further analysis is required to determine if sleep disturbance is a potential impact from construction. The OEH refers to the guidance of the NSW Environmental Criteria for Road Traffic Noise (EPA 1999). The NSW Environmental Criteria for Road Traffic Noise provides that maximum internal noise levels below 50 dB(A) to 55 dB(A) are unlikely to cause awakening reactions and that maximum internal noise levels of 65 dB(A) to 70 dB(A) are not likely to significantly affect health and wellbeing.

Maximum noise levels predicted for intricate lifts during the night time period (11pm to 7am) at the facade of the nearest sensitive receiver are up to 78 dB(A) which is approximately 68 dB(A) internally with windows open. Maximum noise levels predicted for piling (proposed to occur during the night time period between 5am and 7am) at the facade of the nearest sensitive receiver are up to 99 dB(A) which is approximately 89 dB(A) internally with windows open.

These levels are above those of the NSW Environmental Criteria for Road Traffic Noise (EPA 1999) identified above and therefore construction activities at night may cause awakening reactions and may affect health and wellbeing of the nearest residential receivers. However with the implementation of the safeguards and management measures at Section 5.5 it is expected that the actual noise level at the nearest residential receiver would be less.

Other residential receivers may also be affected during sleep however impacts on these receivers would reduce as the distance to the receiver increases. Figure 6-2 identifies areas for direct and indirect notification.

Impacts on sleep would be intermittent as piling works would be conducted for two hours at the end of the night time period. Similarly, there would be minimal use of cranes (expected to be about 20 lifts throughout the duration of the construction period). To further minimise impacts on sleep and health and wellbeing all reasonable and feasible mitigation measures would be implemented with the aim of achieving the noise management level to minimise impact on nearby sensitive receivers.

Construction – vibration

Safe working distances for both cosmetic damage and human comfort are identified at Table 6-11.

Removal of the existing wharf and the removal and installation of piles would have the potential to exceed cosmetic damage and human comfort criteria depending on their proximity to nearby structures or receivers. Activities that cause vibration may occur within the safe working distances of Sails on Lavender Bay. A safeguard has been included to prepare a dilapidation report for this building and to carry out vibration monitoring for high vibration generating activities such as piling and removal of structures on the wharf.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Receiver location</th>
<th>Predicated noise level (dB(A))</th>
<th>Noise management level (dB(A))</th>
<th>LAeq (15min) dB(A) exceedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>General construction works</td>
<td>1</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
</tbody>
</table>

Note: No night time works are proposed for general construction works associated with roadside works.

*Scenarios 1 and 4, or the use, trucks, angle grinders, electric saws, hand held drilling equipment, and concreting vehicles and equipment would not be undertaken during the night time period.
The nearest residential receiver from vibration causing works is about 40 metres. At this distance the safe working distances for cosmetic damage and human comfort would be satisfied and no further consideration of vibration management would be required.

Table 6-11 Safe working distances for vibration generating works

<table>
<thead>
<tr>
<th>Plant item</th>
<th>Safe working distance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cosmetic damage</td>
</tr>
<tr>
<td>Piling (with hammers up to 900 kg impact)</td>
<td>5 metres</td>
</tr>
<tr>
<td>Vibration piling equipment</td>
<td>5 metres</td>
</tr>
<tr>
<td>Auger piling equipment</td>
<td>2 metres</td>
</tr>
<tr>
<td>Hand held hydraulic hammer</td>
<td>No contact with affected structures</td>
</tr>
</tbody>
</table>

Operation impacts

The new ferry wharf would be located slightly further away from residential receivers. Given there would be no change to the ferry times the proposal is unlikely to have any additional operational noise impacts on residential receivers.

The incidental bumping of ferries on the pontoon as they dock would result in some vibration to the supporting piles. These are existing impacts and are not expected to increase in frequency or magnitude as a result of the proposal.

6.4.5 Safeguards and management measures

Table 6-12 Noise and vibration safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise and vibration</td>
<td>• Notification of all potentially affected residents and businesses will be undertaken within 14 days of the proposed night time works as shown in Figure 6-2 of this REF</td>
</tr>
<tr>
<td></td>
<td>• These notifications will include the timing and nature of works as well as the expected noise levels, duration and impacts prior to the commencement of construction</td>
</tr>
<tr>
<td></td>
<td>• Contact details to lodge noise complaints or receive updates would also be provided at this time.</td>
</tr>
<tr>
<td></td>
<td>Responsibility: Project manager</td>
</tr>
<tr>
<td></td>
<td>Timing: Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Noise and vibration    | • A noise and vibration management plan will be prepared and incorporated into the CEMP. The management plan will include but not be limited to:  
  • Reasonable and feasible noise control measures to reduce noise levels taking into account the control methods specified in Section 6.8 and Chapter 7 of the noise and vibration impact assessment for the proposal  
  • Identification of nearby sensitive noise receivers  
  • Details of the assessed hours of work and work to be undertaken  
  • Behavioural practices or other management measures to be implemented to minimise noise  
  • A complaints handling process.                                                                                                                                  | Project Manager          | Pre-construction |
<p>| Noise and vibration    | • Work will be carried out during the recommended standard construction hours identified in the Interim Construction Noise Guideline (DECC, 2009a) as much as practicable.                                              | Project Manager          | Construction  |
| Noise and vibration    | • Temporary hoarding will be erected around the compound site.                                                                                                                                                           | Project Manager          | Construction  |
| Noise and vibration    | • Construction personnel will be informed of the location of sensitive receivers, and the need to minimise noise and vibration from the works, through the site induction and regular toolbox talks.                                  | Project Manager          | Construction  |
| Noise and vibration    | • The use of portable radios, public address systems or other methods of site communication that may unnecessarily impact on residents will be avoided.                                                                     | Project Manager          | Construction  |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| Noise and vibration    | • Construction plant and vehicles regularly used on site will be fitted with reverse alarms that are tonal  
                        | • Site practices that minimise reversing movements will be implemented wherever practicable. | Project Manager | Construction     |
| Noise and vibration    | • Plant and equipment will be regularly inspected to ensure they are in good working order and not emitting excessive noise levels. | Project Manager | Construction     |
| Noise and vibration    | • Quieter plant and equipment will be selected based on the optimal power and size to most efficiently perform the required task. | Project Manager | Construction     |
| Noise and vibration    | • Rubber matting will be installed over material handling areas (such as in the bed of trucks) to minimise noise from materials being dropped. | Project Manager | Construction     |
| Noise and vibration    | • Concrete pumps will be screened, using a solid material such as a hoarding or the like, from surrounding receivers where practicable. | Project Manager | Construction     |
| Noise and vibration    | • Noise monitoring using a hand held metering device will be undertaken at the site from time to time during the high noise periods including removal and piling  
                        | • The results of monitoring will be used to devise further control methods where required. | Project Manager | Construction     |
| Noise and vibration    | • A condition report for the Sails on Lavender Bay restaurant will be carried out prior to the commencement of removal of the wharf and piling activities. | Project Manager | Pre-Construction |
### Noise and vibration

- Vibration monitoring will be carried out at the commencement of piling activities to determine suitable vibration limits based on site conditions. A procedure would then be developed outlining the vibration monitoring required and the process for responding to any exceedance of vibration criteria. Vibration monitoring could include either continuous vibration monitoring during piling works and removal or attended monitoring.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise and vibration</td>
<td>• Vibration monitoring will be carried out at the commencement of piling activities to determine suitable vibration limits based on site conditions. A procedure would then be developed outlining the vibration monitoring required and the process for responding to any exceedance of vibration criteria. Vibration monitoring could include either continuous vibration monitoring during piling works and removal or attended monitoring.</td>
<td>Project Manager</td>
<td>Pre-Construction</td>
</tr>
<tr>
<td>Noise and vibration</td>
<td>• Roads and Maritime will consult with Sails on Lavender Bay restaurant at least two weeks prior to commencement of construction to determine reasonable noise management measures during lunch service.</td>
<td>Project Manager</td>
<td>Pre-Construction</td>
</tr>
</tbody>
</table>

### Flora and fauna issues

#### 6.5.1 Existing environment

**Aquatic**

An aquatic ecology assessment was completed by Marine Pollution Research Pty Ltd in April 2015. The assessment included a diver-based aquatic ecology survey on 20 October 2011, 11 August 2012, 28 November 2013 and 6 January 2015. The divers surveyed the seabed around the area of the existing wharf and the location of the proposed wharf, and the seabed and rocky reef along the seawall for 520 metres either side of the proposed replacement ferry wharf. The report is presented in Appendix E and key findings are discussed below.

The original shoreline at McMahons Point has been reclaimed and is generally retained by a vertical sandstone block and concrete seawall that extends to the seafloor. This seawall extends under and either side of the existing wharf.

The site is exposed to winds across the harbour from the south-east to south west and is sheltered or has only limited fetch for other wind directions. The site is also exposed to wash from local passing vessels.

The Sydney Harbour Foreshores Area Development Control Plan maps dated 2005 indicate the aquatic habitat to be rocky platforms on the eastern side of Lavender Bay with two areas of sandy beaches on the western side of the bay. Another sandy beach, the closest of the identified habitats, is indicated as being about 200 metres to the west of the wharf. The SREP Sydney Harbour Wetlands Protection Area maps dated 2005, identify this location as being a wetland and also identifies another wetland on the northern shore of Lavender Bay about 500 metres from the proposal.

About 104 threatened marine species (endangered marine populations, protected marine fish species and marine plants), listed under either the EPBC Act, FM Act or TSC Act, have been
identified as potentially occurring within 10 kilometres of the site (refer to Appendix F). Of the listed species, those that have the potential to utilise any of the habitats located within the vicinity of the site are discussed below.

The FM Act and the EPBC Act list a number of shark and other fish species as threatened species. *Sygnathiformes* (seahorses, seadragons, pipefish, pipehorses and seamoths) are protected, under both the EPBC Act and the FM Act.

Of the listed threatened shark species, the Grey Nurse and Great White Shark could potentially visit the location of the proposal in pursuit of mobile prey, however, the location of the proposal does not provide suitable habitat for these shark species. The likelihood of these species occurring at the site is low.

The Black Rock Cod (*Epinephelus daemelli*), listed as vulnerable under the FM Act, is the only threatened species under the FM Act that has the potential to occur in the area. Juveniles could occur as transients in the area from time to time due to the presence of rock rubble shelter and feeding habitat. In any case, the habitat in the location of the proposal would not be suitable for adult or juvenile Black Rock Cod because there were no suitable rock, rock crevice or cave habitats.

Of the 31 Sygnathiformes species known from NSW waters, three (White’s seahorse *Hippocampus whitei*, Coleman’s Seahorse *Hippocampus colemani* and the Pygmy Pipehorse *Idiotropiscis sp.*) are endemic to NSW and White’s seahorse is common in Sydney Harbour. Specific searches were also made on both dive occasions for syngnathids, with particular reference to White’s seahorse, which is known to inhabit jetty and wharf structures in Sydney Harbour. No syngnathids were observed during the survey and overall it was considered that there was little seabed rock rubble around the piles to support permanent seahorse numbers and no dense kelp cover on the lower pile habitats, both of which are necessary to provide adequate shelter habitat from predatory fish. However, given that there is some suitable habitat on the jetty piles and amongst the rocky rubble, it is possible that they could visit the piles from time to time.

Other threatened aquatic species or populations that are known to occur in Sydney Harbour include various cetaceans (whales and dolphins), marine mammals (seals and sea lions), marine reptiles (turtles and sea snakes), sea birds (ocean birds and waders) and the Little Penguin. These species are known to penetrate the harbour, to and beyond the study area, but are unlikely to occur in the location of the proposal due to there being a lack of suitable habitat.

The surveys identified the following aquatic habitats in the vicinity of the proposal:

- High submerged portions of the seawall about one metre above the base of the seawall
- Inner-intertidal zone – comprising the low intertidal part of the seawall and some exposed areas of rock rubble at the base of the seawall
- Sub-tidal fringe – comprising rock rubble within the low intertidal/shallow sub-tidal fringe
- Shallow sub-tidal reef – comprising some exposed basement rock and an almost total cover of sub-tidal rock rubble extending about eight to 10 metres offshore around the existing wharf at water depths varying from 0.5 metres to about three metres below LAT and to about one metre below LAT further south and west.
- Sandy seabed – firm to loose shelly-sand inshore to silty-sand offshore

The specific species identified in the proposal location during the diver-based aquatic ecology survey are shown in Table 6-13.
Table 6-13 Aquatic habits and ecology

<table>
<thead>
<tr>
<th>Aquatic habitat zones</th>
<th>Species identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>High submerged portions of the seawall</td>
<td>• A variety of intertidal animals dominated by molluscs Littorinid snails, <em>Nodilittorina unifasciata</em> in the higher intertidal, and <em>Bembicium nanum</em> plus Sydney rock oysters in the mid to low intertidal.</td>
</tr>
<tr>
<td>Inner-intertidal zone</td>
<td>• A variety of barnacle species and chitons, limpets, several varieties of Periwinkle snails and Sydney Rock oysters.</td>
</tr>
</tbody>
</table>
| Sub-tidal fringe                      | • A variety of encrusting, fringing and short frondose algae species including red encrusting coraline species  
• The shallow subtidal fringe also supports encrusting tube worms (*Galeolaria caepitosa*), sea squirts (mainly Cunjevoi, *Pyura stolonifera*) and mussels. |
| Shallow sub-tidal reef                | • The aquatic biota assemblage is dominated by brown macro-algae taxa; kelp, *Ecklonia radiata*, and several *Sargassum* species  
• There are small clumps of green algae (*Caulerpa filiformis*), and in the deeper waters the rocks have a cover of a pink encrusting algae plus a variety of sponges  
• There are a variety of molluscs including turban shells plus mussels and there are sea-urchins amongst rocks in deeper waters. |
| Sandy seabed                          | • Benthic biota species including small crustaceans, molluscs and worms, mainly in the deeper sub-tidal sediments which are not disturbed by wave action  
• Kelp or *Sargassum* species supported by isolated rocks scattered along the bottom just off the rock rubble reef. |

The wharf support piles showed similar differentiation by depth, with barnacles and oysters in the lower intertidal, fringing and frondose algae in the lower intertidal to shallow subtidal zone, mixed frondose algae plus kelp in mid waters, and mixed encrusting biota plus a few kelp in deeper waters to the seabed.

No threatened species, or core habitat for these species, were observed during the surveys. As such, it is considered that assessments of significance under the TSC, FM and EPBC Acts are not required for any of the listed species.

Although the pest algae species *Caulerpa taxifolia* listed under the FMA is known to occur in Sydney Harbour, no plants or patches of the marine pest algae were identified in the location of the proposal or surrounds during surveys. No mangroves, saltmarsh or seagrass identified during the surveys.

Commercial fishing was banned in Sydney Harbour in 2006 due to elevated levels of dioxins recorded in fish and crustaceans. There are no commercial fishing operations or aquaculture activities in the vicinity of the proposal. Consequently, the proposal would not have any impact on commercial fishing operations or aquaculture activities.
Terrestrial

Native vegetation within the North Sydney LGA has been substantially altered and fragmented by urban development. The site is highly urbanised and is devoid of trees with the exception of small garden bed between the wharf and Sails on Lavender Bay.

A search of the Atlas of NSW Wildlife (28 January 2015) found records of 458 threatened species and 22 threatened communities listed under the TSC Act within a 10 kilometre radius of McMahons Point Wharf (Appendix F), though none of these records were from within the immediate vicinity of the wharf. The location of the proposal is unlikely to provide suitable habitat, roosting or food resources for any of the listed terrestrial species identified.

An EPBC Act Protected Matters Search Report was generated on 28 January 2015 for a 10 kilometre radius of McMahons Point Wharf. The report identified the potential for five threatened ecological communities, 75 threatened species and 64 migratory species to occur within the search area.

A survey for threatened microbats at McMahons Point Wharf and the eastern and western sides of Blues Point Reserve, including the wooded areas of the reserve, was undertaken before nightfall on 5 March 2012 (Appendix G). These areas were traversed on foot and scanned using a hand-held Anabat detector. Microbats and suitable bat habitat were not found to be present around McMahons Point Wharf during the survey. It was noted that there is some foraging habitat within Blues Point Reserve however no bats were present most likely due to the scarcity of suitable foraging habitat and the extent of night lighting in the area. No assessments of significance under the TSC Act were considered necessary because it is unlikely any threatened microbats would be found on site.

The location of the proposal is unlikely to provide suitable habitat, roosting or food resources for any of the listed terrestrial species identified. Some of the listed migratory could potentially visit the location of the proposal however, the location of the proposal does not provide habitat for these species. As a result no further assessment was considered to be required for these species.

6.5.2 Potential impacts

Construction impacts

Aquatic

Potential construction impacts of the proposal on aquatic flora and fauna are discussed in Table 6-14.

Table 6-14 Potential impacts to aquatic flora and fauna

<table>
<thead>
<tr>
<th>Potential impact</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of marine organisms attached to the submerged surfaces of piles to be removed</td>
<td>• This would be a direct impact however new piles would provide a similar (by virtue of greater depths) amount of wetted surface area for recolonisation. As such, the potential impact would be considered temporary.</td>
</tr>
<tr>
<td>Potential impact</td>
<td>Assessment</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Loss of rocky reef habitat to piling operations.</td>
<td>• The installation of four piles to support the bridge would require placement of these piles into the shallow rocky reef, which would in turn require displacement of rock rubble either passively by pile penetration or actively by removal of rocks prior to piling operations. This would disrupt marine vegetation and attached fauna including sea-urchins residing in the crevices between the rocks</td>
</tr>
<tr>
<td></td>
<td>• Whilst there would be a loss of habitat, this loss is considered temporary, as the displaced rocks would be recolonised by marine biota.</td>
</tr>
<tr>
<td>Loss of benthic organisms and habitat in sandy sediment from pile and anchor placement.</td>
<td>• The placement of the each of the new pontoon piles would displace some shallow sub-tidal sandy sediment habitat. Whilst some of the existing benthic organisms would be displaced sideways by the action of pile driving, some organisms would be lost to the initial pile placement</td>
</tr>
<tr>
<td></td>
<td>• As the area of disturbance from the pile driving activity is very small compared to the total area of soft sediment habitat in the study area, this impact is considered minimal</td>
</tr>
<tr>
<td></td>
<td>• The loss of sandy sediment habitat would be offset by the removal of a larger number of piles from the wooden wharf to be removed, which would provide an overall larger area of soft sediment habitat for recolonisation. Thus, this loss would be a temporary one with an overall increase in soft sediment habitat.</td>
</tr>
<tr>
<td>Loss of protected seahorses that may be living on the wharf piles to be removed.</td>
<td>• Although no seahorses were observed during aquatic surveys, protected seahorses could potentially transit the site from time to time. The potential to impact protected seahorses would be reduced by a suitably qualified and licensed marine scientist conducting a preliminary inspection of the suitable habitat and relocating any seahorses to adjacent suitable rocky reef habitat away from construction works. Relocating Syngnathiformes requires a licence under section 37 of the FM Act.</td>
</tr>
<tr>
<td></td>
<td>• Safeguards and management measures outlined in Section 6.7.3 would address these potential impacts.</td>
</tr>
<tr>
<td>Potential increase in water turbidity due to the removal and installation of piles and the operation and anchoring of construction vessels, especially in shallow waters.</td>
<td>• Turbidity would be localised to the immediate area around the piling work or anchorage locations. Sediments would be confined to bottom waters and would settle rapidly. Additionally the benthic assemblage in the vicinity of the piles would be expected to contain organisms that are generally tolerant of occasional turbidity</td>
</tr>
<tr>
<td></td>
<td>• The potential impact would be considered temporary and minor. Turbidity can be reduced with the adoption of environmental safeguards.</td>
</tr>
</tbody>
</table>
### Potential impact

<table>
<thead>
<tr>
<th>Potential impact</th>
<th>Assessment</th>
</tr>
</thead>
</table>
| Damage to aquatic habitats and flora from anchoring and excessive wash and propeller thrust by construction vessels. | • Construction vessels would be anchoring and maneuvering in the location of the proposal throughout the construction work. Anchoring and vessel wash and propeller thrust may cause damage to the harbour bed in these locations  
• Safeguards and management measures outlined in Section 6.7.3 would address these impacts. |

The proposal would not comprise any dredging or reclamation activities and would not result in impacts to marine vegetation. Therefore, the proposal would not need to be notified to the Minister for Trade and Investment and would not require a permit under Part 7 of the FM Act.

DPI (Fisheries) were notified of the proposal and confirmed that a permit or formal notification under the FM Act is not required for this proposal (Appendix H). DPI (Fisheries) recommended that material removed is deposited appropriately on land and that silt curtains are used during construction to mitigate turbidity. Accordingly, these measures have been included as safeguards at Section 3.3.3 and 6.1.3.

The aquatic ecology conservation requirements of the SREP Sydney Harbour have been considered and the proposal is consistent with its criteria for biodiversity, ecology and environmental protection.

**Terrestrial**

No vegetation or habitat for terrestrial species would be removed or damaged as a result of the proposal. The proposal would be unlikely to impact on any threatened species, including threatened microbats. Assessments of significance under the TSC Act were not considered necessary.

**Operation impacts**

**Aquatic**

The main operational impact would be the potential for impacts arising from the shading of rocky reef, disturbance of aquatic habitats from vessel propeller or jet wash and the potential for litter and contaminated stormwater entering the harbour from the use of the pontoon.

The bridge and western portion of the gangway would shade some of the rocky reef habitat however it is expected that there would be ample reflected and refracted light reaching most of the shaded areas thus resulting in negligible change to algae cover in this area.

The removal of the existing wharf would expose a large area of rock reef that is presently shaded and does not support marine algae. This area would now be exposed to sunlight and would be rapidly colonised by algae. Overall, there would be a net increase in rocky reef habitat for marine algae at the site.

The wetted surfaces of the pontoon would provide valuable support of marine algae. These surfaces would not be subjected to tidal variation and would be able to support shallow sub-tidal fringing algae assemblages that are generally more diverse than algae assemblages on pile vertical surfaces, such as those to be removed.

The berthing faces would be located in deeper waters further off-shore then the existing wharf, thus the overall potential for disturbance from vessel propeller or jet wash is less. The orientation of the pontoon wharf is also such that propeller and jet wash are directed off-shore rather than towards the inshore rubble reef, minimising effects from vessel movements on aquatic habitats, marine vegetation or other biota of the locality.

Overall, there would be a net beneficial impact from the proposal as there would be no net loss of aquatic habitat in the medium to long term and there would be a beneficial impact for reef fish
assemblages utilising the additional marine assemblages attached to the wetted surfaces of the pontoon.

**Terrestrial**

There would be no additional operational impacts to terrestrial flora or fauna as a result of the proposal.

**Table 6-15 Flora and fauna safeguards and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora and fauna</td>
<td>• A spill management plan will be developed and communicated to all staff working on site.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>• If any threatened aquatic species are noted at the construction site unexpectedly, all in water construction works should be halted until the species has left</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                         | • Prior to commencement of pile driving operations, the contractor is to call Sydney Port Control to check whether there have been any sightings of marine mammals and if so their current location
<p>|                         | • If marine mammals are reported west of Sydney Harbour Bridge (or immediately to east of Sydney Harbour Bridge and travelling west), pile driving operations are to cease or not be undertaken until the marine mammals are reported to be east and well clear of the Sydney Harbour Bridge and travelling east |
|                         |                                                                                                                                                                                                                         | Project manager | Construction |
| Flora and fauna         | • The construction work site area used will be the minimum size necessary to safely undertake the proposal                                                                                                                | Project manager | Construction |
|                         | • Exclusion zones will be established to identify the work area and prevent damage to marine habitats outside the work area                                                                                               |
|                         | • Should the construction work area identified at Figure 3-1 be expanded further environmental assessment would be required.                                                                                             | Project manager | Pre-construction |
|                         |                                                                                                                                                                                                                         |                 | Pre-construction |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora and</td>
<td>• All staff working on the site will be advised of the location of rock rubble habitats</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>fauna</td>
<td>• No vessel anchors will be placed on identified rocky reef or marine vegetation habitats</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Anchor cables must be suitably buoyed prior to laying, and kept buoyed once laid, to</td>
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<tr>
<td></td>
<td>prevent cable drag and cable swing damage (scalping) to marine vegetation and rock</td>
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<tr>
<td></td>
<td>rubble habitat areas. Where this is impractical, contractors will use floating rope.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Flora and</td>
<td>• All construction related equipment that comes in contact with the seabed (including</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>fauna</td>
<td>mooring tackle, cables, ropes and anchors), must be inspected for attached fragments</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of the declared pest algae species <em>Caulerpa taxifolia</em> and any fragments found must</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>be collected and disposed of into plastic bags then placed into garbage bins on shore</td>
<td></td>
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<tr>
<td></td>
<td>in the NSW Control Plan for the Noxious Marine Algae <em>Caulerpa Taxifolia</em> (Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of Industry and Investment, 2009).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flora and</td>
<td>• In order to minimise swimming distances for reef fish from piles being pulled to</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>fauna</td>
<td>remaining piles in-shore, the piles to be removed will be systematically removing from</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>seawards towards the shore</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Flora and fauna

- A specialist marine/aquatic ecologist would undertake a pre-construction inspection of the piles for *Syngnathiformes*.
- In the case that any *Syngnathiformes* are observed on the piles, the specialist marine/aquatic ecologist would re-locate these to an adjacent suitable rocky reef habitat away from the construction work site.
- The marine/aquatic ecologist must hold the appropriate permit under section 37 of the FM Act to undertake the handling and relocation of *Syngnathiformes*. This would be obtained prior to the commencement of pile removal.
- All personnel working within the waters of the construction site would be informed of the potential to encounter *Syngnathiformes*.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora and fauna</td>
<td>• A specialist marine/aquatic ecologist would undertake a pre-construction inspection of the piles for <em>Syngnathiformes</em>&lt;br&gt; • In the case that any <em>Syngnathiformes</em> are observed on the piles, the specialist marine/aquatic ecologist would re-locate these to an adjacent suitable rocky reef habitat away from the construction work site&lt;br&gt; • The marine/aquatic ecologist must hold the appropriate permit under section 37 of the FM Act to undertake the handling and relocation of <em>Syngnathiformes</em>. This would be obtained prior to the commencement of pile removal&lt;br&gt; • All personnel working within the waters of the construction site would be informed of the potential to encounter <em>Syngnathiformes</em>.</td>
<td>Project manager</td>
<td>Pre-construction&lt;br&gt; Construction&lt;br&gt; Pre-construction&lt;br&gt; Construction</td>
</tr>
</tbody>
</table>

Other safeguards and management measures that would address flora and fauna impacts are identified in Section 6.1.3.

## 6.6 Land transport and parking

### 6.6.1 Existing environment

**Land transport**

Vehicular access at McMahons Point Wharf is via Henry Lawson Avenue from Blues Point Road. Blues Point Road is a two-way, two-lane local road about one kilometre in length. The road runs generally in a north–south direction from Miller Street (north) before terminating at Blues Point Reserve (south). Henry Lawson Avenue is also a two way, two lane road about 250 metres long, which terminates at a turning circle at the location of the wharf.

A footpath connecting Sails on Lavender Bay restaurant, the wharf, and Blues Point Reserve, aligns the outside of the turning circle. The driveway to the west of Sails provides access to Warung Street and East Crescent Street via steps.

A bus stop is located on the outside of the turning circle adjacent to the wharf. This stop is serviced by Route 265 and 269 which provide services between Lane Cove, North Sydney, Kirribilli and McMahons Point between about 6.20am to 7pm Monday to Friday and about 8.50am to 6pm Saturday. During the week, bus services operate about every 30 minutes.

No bus routes service McMahons Point on Sundays. McMahons Point residents who utilise bus services on Sundays would do so from North Sydney Station.
Parking

Four car parking spaces are located on the southern side of the turning circle at the end of Henry Lawson Avenue, one space is identified as disabled and the other three spaces are time restricted to 30 minute parking. Based upon a site visit to McMahons Point Wharf on 20 November 2013 during the week and between peak morning and afternoon periods, it was noted that two spaces were in use. It is expected that the number of spaces occupied up at peak times would increase. Other car parking is available at the southern end of Blues Point Road and is generally utilised by park users.

6.6.2 Potential impacts

Construction impacts

Land transport

There would be temporary disruptions to commuters as ferry and water taxi services would not operate from McMahons Point Wharf for up to six months during the construction period for the new wharf. During this time, ferry commuters would need to access alternative transport options and/or an alternative ferry wharf. Commuters may choose to use the bus services (bus route 265 to Lane Cove and bus route 269 to Kirribilli) at Henry Lawson Avenue and/or within the surrounding areas to the wharf to access additional public transport services, including bus services to the Sydney CBD, train services along the North Shore line and ferry services from Milsons Point Wharf. Increased usage of these services may increase pressure on the local transport network and the road network. TfNSW has undertaken a scoping of passenger numbers and have advised that they do not anticipate extra service (eg extra bus services from McMahons Point) would be required however they would monitor services during the temporary closure.

A potential increase in pressure on the road network associated with commuters choosing to drive whilst the works are undertaken would potentially cause additional traffic issues, however these impacts would be temporary.

The majority of construction personnel, materials, plant and equipment would travel between the off-site facility and the construction site, via Sydney Harbour on boat or barge. As a result, land transport/traffic associated with construction activities would be minimal. Traffic generated by construction works would include a maximum of 15 vehicle movements per day comprising sub-contractors and concrete trucks travelling to and from the construction site.

During removal of the existing wharf, the existing bus stop at Henry Lawson Avenue would need to be closed and the bus stop would be relocated to a new position at Henry Lawson Avenue. Additional landside works would include the realignment of kerb and gutter north west of the new wharf and to the turning circle at Henry Lawson Avenue.

A traffic control plan would be prepared and implemented to ensure pedestrian safety during construction. It is expected that the new location of the bus stop would be about 20 metres south west of its current location.

Overall, likely impacts to traffic are considered minor and would be unlikely to affect the capacity of the surrounding road network. Any potential impacts associated with construction vehicles at the site would be mitigated through the preparation and implementation of a traffic control plan.

Parking

Most workers would travel to and from the site by boat from the off-site facility minimising impacts to parking in the vicinity of the proposal. Most plant, equipment and materials would also be transported to the construction work site by barge or boat.

Some vehicles would require parking at or near the site on occasion during construction of the wharf interchange, including concrete trucks and some sub-contractors’ vehicles. During construction there would be a loss of four car parking spaces on the southern side of the turning circle, however parking at this location would not be used by commuters as the parking is time restricted.
minutes). Additional parking in the vicinity of the wharf includes two hour and four hour time
restricted parking located on the northern side of Henry Lawson Avenue (about 70 metres west of
the wharf) and at the southern end of Blues Point Road (about 200 metres west of the wharf)
respectively. The loss of these four spaces would be temporary. Additional construction traffic at the
site would be temporary and any potential impacts associated with construction vehicles at the site
would be mitigated through the preparation and implementation of a traffic control plan.

As outlined at Section 5.3, council have raised concern about traffic management and worker
parking and have requested that these matters be agreed with council prior to work commencing.
These have been included as management measures at Section 6.1.3.

**Operation impacts**

The proposal would improve the boarding efficiency of McMahons Point Wharf interchange which
may increase the demand for this service. This would reduce pressure on other forms of public
transport and the capacity of the road network.

There would be no other operational impacts expected to land transport (ie bus services) and
parking due to the proposal.

**6.6.3 Safeguards and management measures**

**Table 6-16 Land transport and parking safeguards and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land transport and parking</td>
<td>• A traffic control plan will be prepared in accordance with the ‘Traffic control at work sites manual’ (RTA, 2010a) and Australian Standard 1742.3 (Manual of uniform traffic control devices) and will include such things as appropriate wayfinding signage to be installed advising of alternative transport options where necessary.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>
| Land transport and parking    | • The following matters will be developed in consultation with council prior to work commencing:  
  • Traffic management plan  
  • Worker parking.          | Project manager      | Pre-construction |

**6.7 Water transport**

**6.7.1 Existing environment**

McMahons Point Wharf is used by a variety of water-based transport modes including commuter
ferries, and commercial and recreational vessels. It is located about 1.6 kilometres north west of
Circular Quay by water, which is one of Sydney’s major transport hubs.

McMahons Point Wharf is part of the Sydney Ferries’ Parramatta River (F3) and Darling Harbour
(F4) services, which provide ferries connecting various wharves between Parramatta, Darling
Harbour and Circular Quay.
About 40 ferry services depart from Circular Quay and travel to McMahons Point Wharf each weekday. Weekday ferry services depart from Circular Quay and travel to McMahons Point Wharf from about 6.10am and conclude about 11.30pm. The same number of ferry services departs McMahons Point Wharf each weekday from about 6.15am and conclude at about 7.15pm.

About 35 ferry services depart from Circular Quay and travel to McMahons Point Wharf each Saturday and Sunday commencing at 8.05am and concluding at 11.05pm. The same numbers of ferry services depart from McMahons Point Wharf and travel to Circular Quay each Saturday and Sunday commencing from about 9am and concluding at about 8pm.

McMahons Point Wharf is a ‘priority access wharf’, which means that Sydney Ferries has priority to access the wharf based on their timetabling but the wharf can be used by others at other times. The existing commuter ferry wharf is used by a number of water taxis and commercial recreational vessels. These operate on an as needed basis. McMahons Point Wharf has a single berthing face and congestion has not been raised as an issue during consultation with TfNSW.

McMahons Point Wharf is located within a special port as defined Management of Waters and Waterside Lands Regulations as detailed at Section 4.3.2.

These conditions have been included as the safeguards and management measures at Section 6.7.3.

There are no public or private boating facilities within about 100 metres of the site.

### 6.7.2 Potential impacts

#### Construction impacts

Prior to construction of the proposed wharf interchange, McMahons Point wharf would be closed and removed, causing temporary disruption to ferry services and water taxi services at the site for up to six months.

In terms of water-based construction vessels, there would be up to three service barges, all of which would be brought to the construction site from an off-site facility on a daily basis, and a number of smaller craft used to transport construction workers to the site. This would increase water based traffic within Sydney Harbour and at the mouth of Lavender Bay.

The Deputy Harbour Master has provided written permission in accordance with Management of Waters and Waterside Lands Regulations subject to the following construction conditions. These conditions have been included as a management measure at detailed at Section 6.7.3.

**Construction**

- Prior to the commencement of the works, the Applicant is to prepare a Marine Traffic Management Plan for implementation during water based construction and wharf removal works, which is required to be prepared in consultation with NSW Maritime and approved by the Harbour Master.

- The proposed works are not to interfere with the movement of seagoing ships unless agreed in advance with the Harbour Master. This requirement must be included in the Marine Traffic Management Plan.

- Buoys are not to be laid in or adjacent to the shipping channels unless agreed in advance with the Harbour Master.

- All buoys are to be fitted with lights.

- All vessels associated with the construction works are to have Response Plans for emergencies and spills.

- Provide the Harbour Master with an ‘All Hours’ contact number during construction of the facility.

- Any marine spill (whether the spill occurs on water or occurs on land and subsequently enters the water) is to be immediately reported to Sydney Ports VTS on 9296 4000.
• Any material associated with the construction of the development that enters the water is to be immediately retrieved. Should the material not be retrieved, Sydney Ports will organise for its removal and recover the cost from the Applicant.

**Operation**

The proposal is designed to enhance water transport in Sydney Harbour by improving access to commuter ferry services. There would be no increase in boating activity generated by the operation of the proposal.

The new dual berth pontoon would be located further offshore and to the south east of the current location. As a result there would be negligible or no impacts to navigational lanes and ferries would berth further off-shore than at present. The Deputy Harbour Master has provided written permission in accordance with *Management of Waters and Waterside Lands Regulations* subject to the following operational condition. This condition has been included as a management measure at detailed at Section 6.7.3.

Subject to Harbour Master approval solar powered navigation lights (Fl.y) may be required to be fitted to the two seaward piles (31 and 32G) in order to provide warning of the wharves presence in the event of a power failure.

Charter and recreational vessels would continue to be able to use McMahons Point Wharf and therefore there would be no change in terms of use of the wharf.

Private jetties and vessel moorings within Lavender Bay would not be impacted by the proposal.

### 6.7.3 Safeguards and management measures

**Table 6-17 Water transport safeguards and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water transport</td>
<td>• Commercial, recreational operators and private services that use the existing wharf will be advised of the wharf closure at least two weeks prior to closure.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Water transport</td>
<td>• The water-based construction zone will be clearly delineated and marked to prevent non-construction vessels from entering the construction site.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
</tr>
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<td>----------------</td>
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<td>-----------------------------</td>
</tr>
<tr>
<td>Water transport</td>
<td>• A Marine Traffic Management Plan (MTMP) will be prepared and implemented during water based construction and wharf removal works, in consultation with NSW Maritime and approved by the Harbour Master&lt;br&gt;• The proposed works will not interfere with the movement of seagoing ships unless agreed in advance with the Harbour Master&lt;br&gt;• Buoys will not to be laid in or adjacent to the shipping channels unless agreed in advance with Harbour Master&lt;br&gt;• All buoys will be fitted with lights&lt;br&gt;• All vessels associated with the works are to have Response Plans for emergencies and spills&lt;br&gt;• At least one vessel associated with the works is to be fitted with AIS&lt;br&gt;• The applicant is to consult with the Harbour Master and Roads and Maritime with regard to the navigation lights to be fitted to the structure&lt;br&gt;• Any marine spill (whether the spill occurs on water or occurs on land and subsequently enters the water) is to be immediately reported to Sydney Ports VTS on VHF Channel 13&lt;br&gt;• Any material associated with the construction of the development that enters the water is to be immediately retrieved. Should the material not be retrieved, the Port Authority will organise for its removal and recover the cost from the Applicant&lt;br&gt;• The Applicant is to prepare a Communications Plan, for implementation during the works, which must include / address 24/7 contact details, protocols for enquiries, complaints and emergencies.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
</tbody>
</table>
6.8 Landscape, visual and urban design

An Urban Design Report and Landscape Character and Visual Impact Assessment has been prepared by Jane Irwin Landscape Architects in accordance with Roads and Maritimes’ *Environmental Impact Assessment-Guidance Note, Guideline for landscape character and visual impact assessment*. The findings of this assessment are discussed below and the full report is provided at Appendix H.

A combination of the sensitivity of an area or a view and the magnitude of the proposal (scale, character, and distance) was used to determine the landscape, visual and urban design impacts of the proposal (refer to Figure 6-3 for grading values).

![Figure 6-3 Landscape character and visual impact grading matrix](image)

### 6.8.1 Existing environment

**Landscape character**

The areas surrounding the proposal are made up of 12 landscape character zones (refer to Figure 6-4 and include several iconic visual elements including Luna Park, Sydney Harbour Bridge, Sydney Opera House and the Sydney CBD skyline. The landscape character within the vicinity of the proposal consists of a mixed urban foreshore and parkland edge. The wharf contributes to a layering of elements which include the harbour, parkland, sea wall, Sails on Lavender Bay restaurant, and low/medium to high density residential developments. There is little consistency in the form or materials and colour of built elements surrounding the wharf.

McMahons Point Wharf adjoins relatively flat land within Blue Point Reserve and Henry Lawson Avenue to the south and west, respectively. Blues Point Reserve continues to the west and covers the northern portion of McMahons Point. Sails on Lavender Bay restaurant adjoins the wharf to the north and along with other residential and serviced apartment developments, forms the western side of Lavender Bay.

The existing wharf (refer to Figure 2-4 and Figure 2-5) consists of fixed concrete wharf with an open deck, timber steps to the water, and a small scale shelter that provides shelter from the wind and rain. The wharf is illuminated at night and is adjacent to street lighting within Blues Point Reserve.

Overall, the character of the area has been assessed as having a moderate sensitivity to change.
Key viewpoints for the proposal are listed in Table 6-18 and represented in Figure 6-6 to Figure 6-14 below. These viewpoints are representative of the range of viewpoints within the visual catchment, including those of residential properties, public spaces and Sails on Lavender Bay. Viewpoints B, E, and F are representative of views from the water.
Key viewpoint locations include:

- A. Henry Lawson Avenue
- B. Blues Point Reserve
- C. Eastern Foreshore McMahons Point
- D. Public Jetty at Quiberie Park
- E. Northern Foreshore Walk
- F. Dawes Point
- G. Sydney Opera House
- H. Walsh Bay
- I. Luna Park

Views B, E and F are representative of views from the water.

**Figure 6-5** Visibility of proposal and key viewpoints (source: JILA, 2015)
Figure 6-6 Viewpoint A – McMahons Point Wharf from Henry Lawson Avenue

Figure 6-7 Viewpoint B – View looking north east towards existing McMahons Point from Blues Point Reserve
Figure 6-8 - Viewpoint C Looking south east towards McMahons Point from western edge of Lavender Bay

Figure 6-9 Viewpoint D – Looking south towards McMahons Point from public jetty at Quiberie Park on western edge of Lavender Bay
Figure 6-10 Viewpoint E – Looking west towards McMahons Point from pedestrian promenade on eastern side of Lavender Bay

Figure 6-11 Viewpoint F – Looking north west towards McMahons Point from Dawes Point
Figure 6-12 Viewpoint G – Looking north-west towards McMahons Point from Sydney Opera House

Figure 6-13 Viewpoint H – Looking north towards McMahons Point from Walsh Bay
Figure 6-14 Viewpoint I – Looking west towards McMahons Point from Luna Park Bay

Table 6-18 Identification and description of existing views

<table>
<thead>
<tr>
<th>Viewpoint/ description</th>
<th>Description of the setting</th>
<th>Visible elements of the proposal that can be seen in the view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint A – View from Henry Lawson Avenue (Figure 6-6)</td>
<td>Clear views towards the Sydney Harbour Bridge and Sydney Opera House are available along Henry Lawson Avenue. From the end of Henry Lawson Avenue views are available into Lavender Bay and across to Luna Park on the northern shore of Sydney Harbour. Henry Lawson Avenue is backed on the northern side by the sandstone escarpment with residential apartment buildings on top.</td>
<td>Shelter, bridge and pontoon.</td>
</tr>
<tr>
<td>Viewpoint B – View from Blues Point Reserve (Figure 6-7)</td>
<td>Key views include the view to the east towards the Sydney Harbour Bridge and Sydney Opera House.</td>
<td>Pontoon and gangway</td>
</tr>
<tr>
<td>Viewpoint/Description</td>
<td>Description of the Setting</td>
<td>Visible Elements of the Proposal That Can Be Seen in the View</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Viewpoint C – View from western edge of Lavender Bay including Sails on Lavender Bay restaurant (Figure 6-8)</td>
<td>This view encompasses the whole of Lavender Bay, with key views towards the Sydney Harbour Bridge and Sydney Opera House available to the southeast. Views of the CBD are obscured from this angle by the terrain of the peninsula.</td>
<td>Shelter, bridge, gangway and pontoon.</td>
</tr>
<tr>
<td>Viewpoint D – View from public jetty at Quiberie Park on western edge of Lavender Bay (Figure 6-9)</td>
<td>The view consists of a layering of elements from moored boats in the foreground, the proposed wharf in the mid-ground, to the finger wharves and CBD skyscrapers in the background.</td>
<td>Shelter, bridge, gangway and pontoon.</td>
</tr>
<tr>
<td>Viewpoint E – View from pedestrian promenade on eastern edge of Lavender Bay (Figure 6-10)</td>
<td>Views along the promenade change in character from the contained internal views from the foreshore of Lavender Bay to the open expansive views of Sydney Harbour available from Luna Park. These views take in the opposite shore of McMahons Point as filtered through the private boat moorings that fill Lavender Bay.</td>
<td>Shelter, bridge, gangway and pontoon.</td>
</tr>
<tr>
<td>Viewpoint F – View from Dawes Point (Figure 6-11)</td>
<td>The view from Dawes Point northwest across the main channel of Sydney Harbour are clear and unobstructed. Views from Dawes Point also take in the ferry wharf at Milsons Point with the two structures reading as a consistent design aesthetic and acting as the visual gateway to Lavender Bay.</td>
<td>Shelter, bridge, gangway and pontoon.</td>
</tr>
<tr>
<td>Viewpoint G – View from Sydney Opera House (Figure 6-12)</td>
<td>Clear views around the harbour are available from the Sydney Opera House at a range of terrace levels. The key view to the northwest towards the Sydney Harbour Bridge takes in the proposed wharf as it sits against the built headland of McMahons Point.</td>
<td>Shelter and pontoon.</td>
</tr>
<tr>
<td>Viewpoint/ description</td>
<td>Description of the setting</td>
<td>Visible elements of the proposal that can be seen in the view</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Viewpoint H – View from Walsh Bay (Figure 6-13)</td>
<td>Clear views across the main channel of Sydney Harbour are available from Walsh Bay north towards McMahons Point and North Sydney. The dominant elements within this view are the scale of the buildings in North Sydney CBD that sits along the ridge behind Lavender Bay. The other key component of this view is the open water of the main harbour channel.</td>
<td>Shelter and pontoon.</td>
</tr>
<tr>
<td>Viewpoint I – Luna Park (Figure 6-14)</td>
<td>Views along this walk change in character from the contained internal views from the foreshore of Lavender Bay to the open expansive views of Sydney Harbour available from Luna Park. This viewpoint provides clear unobstructed views to the west towards the proposal.</td>
<td>Shelter and pontoon.</td>
</tr>
</tbody>
</table>

6.8.2 Potential impacts

Construction impacts

During construction of the wharf there would be a temporary decrease in the scenic quality of the local area with the introduction of construction equipment, plant, a compound site, construction vessels in the water, and personnel.

The installation of construction hoarding around the compound site would obstruct some views of Sydney Harbour, Lavender Bay, Luna Park and the Opera House from the public parkland directly adjacent to the wharf and Henry Lawson Avenue. These views would be generally be maintained from the remainder of Blues Point Reserve at the southern end of Blues Point Road. Hoarding would not obstruct any important views from residences surrounding the wharf as these views are from higher elevations and would be over the top of the construction hoarding. Majority of the views obtained from Sails at Lavender, particularly the primary aspects to the north, east and south east would remain unchanged during construction. Views to the south of Observatory Hill, Walsh Bay, and the Sydney CBD skyline, would be obstructed by construction hoarding. These views represent only a small portion of the overall views available from the restaurant.

It is expected that the work would be completed within six months. Impacts during construction would be temporary and moderate.

Operation impacts

The design of the proposal was selected based on its ability to meet the objectives of the proposal while minimising potential visual impacts. Factors that have been considered in the proposed design to minimise impacts are discussed in detail at Section 2.4. These include providing a roof form/shape (over the waiting area) that is innovative but is not visually intrusive and the use of neutral colours and transparent materials which are low in reflectivity and complement the adjacent features of the land.

In addition, the position of the wharf interchange has been selected to minimise view impacts following community consultation as discussed at Chapter 5.
During operation, the wharf introduces new visible components, including a new covered shelter, uncovered bridge and gangway, and an uncovered pontoon. A montage of the proposal is shown at Figure 3-2 and Figure 3-3.

**Landscape Character**

The impact of the proposal from each of the surrounding zones is detailed in Table 6-19. The landscape character within the vicinity of the proposal would result in the following changes:

- The existing fixed wharf with and associated shelter would be removed and replaced with the proposed wharf, including a covered shelter, uncovered bridge and gangway, and an uncovered pontoon.
- The square proportions of the existing roof structure of the existing wharf would be replaced by the curvilinear roof form of the proposed shelter (in the existing position of the existing wharf). The new covered shelter would be of a similar height.
- The new bridge, gangway and pontoon would extend further offshore by about 20 metres than the existing wharf and would be at a different alignment and orientation to the existing wharf.
- The proposed wharf would sit lower than the existing wharf, as well as adopting a different colour palette and selection of materials.

The magnitude of these changes would be moderate given that:

- The proposal would increase the overall scale of the site (compared to the exiting wharf), however the height of the new covered shelter, which is the most prominent element of the proposal would be of a similar height to the existing wharf roof height. It is larger in scale than the existing wharf but would be located further south of the existing covered shelter (refer to Figure 3-1).
- The new bridge, gangway and pontoon would extend out into the harbour from the existing wharf, however these components are uncovered, to reduce the overall height and scale of the proposal.
- An appropriate vertical scale and selection of materials would create a unified built form.
- The use of lightweight materials and adoption of neutral tones and transparent material that complement the surrounding landscape.

Impacts on nearby properties from light spill would be negligible given that the existing wharf and surrounding parkland is lit at night. All lights on the wharf would meet Australian Standards which include relevant light spill criteria and would incorporate dimmers and time clocks so that lights would be dimmed soon after the last ferry of the day. The installation of appropriately designed lighting has been included as a safeguard and mitigation measure.

Overall, the magnitude of change in landscape character that would be created by the proposal within its surrounding environment is considered low to moderate. The backdrop of the sandstone cliff and vegetation against the wharf would have a moderate sensitivity to change in character.
<table>
<thead>
<tr>
<th>Landscape character</th>
<th>Description of zone</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Description of impact by proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1 – Residential zone</td>
<td>The residential zone occupying the peninsula of McMahons Point, extending from the Gore Hill Freeway around the back of Lavender Bay and down to Blues Point. The character of the zone is predominantly residential consisting of two to six storey buildings, a mix of terraces, houses and apartment buildings. The zone is organised around the ridge street of Blues Point Road that contains a mixture of restaurants, shops and commercial buildings. It is a medium to high density residential area, dominated by built form, urban in character.</td>
<td>M</td>
<td>M</td>
<td>The character of this zone is focused around the fine grain of buildings and the glimpses of the harbour available from many of the streets. Activity is focused along Blues Point Road where the mixture of cafes, shops and restaurants create a vibrant character. Blues Point Reserve also central to the character of the suburb as a major tourist destination to view the Sydney Harbour Bridge. The wharf lies to the north east of this reserve and forms an arrival point to the suburb. The wharf is separated from the built up areas by a sandstone cliff running along Henry Lawson Avenue. The impact of the proposal on the character of the suburb is considered moderate. The wharf sits on the very point of the peninsula, essentially separate from the residential areas and open space.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
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<tr>
<td>Zone 2 - Lavender Bay (Waters)</td>
<td>The bay to the north of the wharf, enclosed by the peninsulas of McMahons Point and Milsons Point. The wharf extends from the southern point of McMahons Point and is mirrored on the opposite shore by Milsons Point wharf both of which frame the entry to the bay. The bay is characterised by private boat moorings and a series of private jetties and marinas along the shore of McMahons Point.</td>
<td>M</td>
<td>M</td>
<td>The impact on Lavender Bay by the proposed wharf interchange is considered moderate. The character of the bay is set by the peninsulas of McMahons and Milsons Point which enclose a deep bay busy with boats. At either side of the entry to the bay lie the two wharves which will form gateway elements to the bay. The proposed wharf will complement the character of the existing wharf at Milsons Point. Due to the location of the proposed pontoon the presence of the wharf in the bay is increased as it becomes an element on the water with a greater association to the bay.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
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<tr>
<td>Zone 3 - Recreation Zone</td>
<td>Located at Milsons Point on the northern shore of Sydney Harbour. Luna Park is an historic amusement park protected by listing on the NSW State Heritage Register. North Sydney Olympic Pool is a swimming and exercise complex located between Luna Park and the Sydney Harbour Bridge. Both sites attract large numbers of recreational users who access the site from the ferry stop on the adjacent foreshore and from the train station on Alfred Street.</td>
<td>M</td>
<td>M</td>
<td>Due to the proximity between the two ferry wharves and their relationship to Lavender Bay, the impact on the character of Luna Park and North Sydney Olympic Pool is considered moderate. These two landmarks are characterised by their foreshore location that affords sweeping views across the harbour. The location of the proposed wharf interchange and its increased scale in the harbour, presents a change from the existing condition.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
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<tr>
<td><strong>Zone 4 - Milsons Point/ High Rise Zone</strong></td>
<td>This zone is defined by high rise buildings occupying the ridge between the northern Harbour Bridge abutment, train line and freeway, and the lower foreshore level of Luna Park and North Sydney Pool on the eastern side of Lavender Bay. This zone has a mixture of commercial towers, residential towers and hotels. Views to the harbour are available from the surrounding streets. Panoramic views are available from the buildings themselves.</td>
<td>L</td>
<td>L</td>
<td>The impact on the character of Milsons Point - high rise zone is considered low. The character of this zone is tied to the panoramic views available from the ridge and the dominance of the Sydney Harbour Bridge northern Pylons. The character of this zone has historically been tied to its role as a transport connection point for ferries across and around the harbour and later as the connection point for the bridge. The proposed wharf impacts on the character of this zone as a peripheral element that reads with the new wharf outside Luna Park.</td>
</tr>
<tr>
<td><strong>Zone 5 - Dawes Point</strong></td>
<td>The foreshore and open space around the southern Harbour Bridge abutment, adjacent to the Rocks heritage area. The zone is largely open providing views at different levels around the harbour. The character of this zone is tied to its military and maritime history.</td>
<td>N</td>
<td>N</td>
<td>The character of this zone is dominated by the presence and scale of the Sydney Harbour Bridge, its southern pylons and associated road infrastructure. The character is also set by the wealth of heritage buildings and archaeological remnants dating back to the colonial establishment of Sydney. The impact on the character of this zone is considered negligible.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
</tr>
<tr>
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</tr>
<tr>
<td>Zone 6 - Sydney Harbour</td>
<td>The large body of water to the south of McMahons Point wharf and stretching to the east and west of it. Sydney Harbour is a flooded river valley and as such contains steep ridged peninsulas which enclose harbours, coves and inlets along its length.</td>
<td>M</td>
<td>L</td>
<td>McMahons Point Wharf forms part of a collection of inner harbour wharfs located in protected coves and bays. The proposed wharf replaces the current wharf and introduces a large pontoon at water level. The significance of the wharf in the broader landscape character of Sydney Harbour is the continuity it provides to commuting by water and its role in linking the waterside suburbs to a greater experience of the harbour. Impact is considered low.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Zone 7 - Walsh Bay/ Finger wharves</td>
<td>The bay directly to the south of McMahons Point, characterised by the finger wharves which extend from a heavily built shoreline of historic warehouse buildings. The bay was the site of the first port facilities in Sydney.</td>
<td>M</td>
<td>M</td>
<td>The character is set by the distinctive forms of the finger wharves and warehouses along the foreshore. The impact on the character of Walsh Bay is considered moderate due to the close distance between the two points and the scale and form of the proposed wharf interchange. The curvilinear form of the proposed wharf will read in contrast to the timber finger wharves. The proposed wharf will be in keeping with the maritime palette of recreational boats within Walsh Bay.</td>
</tr>
<tr>
<td>Zone 8 – Blues Point foreshore</td>
<td>The zone is at the southernmost tip of the McMahons Point Peninsula and has iconic views of Sydney Harbour. Punctuated by the dramatic Blues Point Tower, it is a foreshore reserve of open grass stretching along the two points of the peninsula, offering uninterrupted views of Sydney Harbour Bridge.</td>
<td>H</td>
<td>M</td>
<td>The impact on the character of Blues Point foreshore zone is considered moderate. The proposed wharf replaces the current structure which sits on the northern edge of this zone. The ferry function which forms a feature in this character zone is maintained.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
</tr>
<tr>
<td>---------------------</td>
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</tr>
<tr>
<td>Zone 9 - Millers / Heritage Zone</td>
<td>The collection of heritage buildings along the ridge behind Walsh Bay, directly to the south of McMahons Point. This zone is characterised by a steep sandstone cliff that separates it from the lower level of the foreshore and finger wharves. The built form is predominantly two to four storey terrace houses and workers cottages. Further up the ridge lies the Sydney Observatory and surrounding open space that provides uninterrupted views around the harbour.</td>
<td>L</td>
<td>L</td>
<td>The character is set by the narrow network of streets and fine grain of heritage buildings along the high sandstone cliffs. The impact on the character of Millers Point is considered low due to the separation of the two by Walsh Bay.</td>
</tr>
<tr>
<td>Zone 10 – Sydney Harbour Bridge</td>
<td>The iconic steel through arch bridge that carries rail, vehicular, bicycle and pedestrian traffic between the Sydney CBD and the North Shore.</td>
<td>M</td>
<td>L</td>
<td>The impact on the character of the Sydney Harbour Bridge is considered low. The proposed wharf will read with the wharf at Milsons Point and signal a gateway to Lavender Bay when viewed from the bridge.</td>
</tr>
<tr>
<td>Landscape character</td>
<td>Description of zone</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Description of impact by proposal</td>
</tr>
<tr>
<td>---------------------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Zone 11 – Sydney Opera House</td>
<td>The World Heritage Listed multi-venue performing arts centre situated on Bennelong Point in Sydney Harbour close to the Sydney Harbour Bridge. The Sydney Opera House is an iconic feature, which is part of the defining character of Sydney.</td>
<td>L</td>
<td>L</td>
<td>While the proposed wharf interchange sits within the Sydney Opera House Buffer Zone, the impact on the character of the zone is considered low. This is due to the long distance between the two structures and existing obscured view to the Sydney Opera House from McMahons Point by Dawes Point and the Sydney Harbour Bridge.</td>
</tr>
<tr>
<td>Zone 12 – Northern foreshore walk</td>
<td>This zone provides a recreational pedestrian route from Kirribilli around to Lavender Bay. It is comprised of a series of foreshore parks linking under the Sydney Harbour Bridge across the front of North Sydney Pool and Luna Park terminating at Lavender Bay.</td>
<td>H</td>
<td>M</td>
<td>The proposed wharf is highly visible from this zone. The character of this zone is tied to the experience of expansive views to open water, changing to intimate views through boat moorings within Lavender Bay. The impact is considered moderate to high with the proposed pontoon forming a new large scale element adjacent to this zone.</td>
</tr>
</tbody>
</table>

N=Negligible; L=Low; ML=Moderate-Low; M=Moderate; H=High

**Views and vistas**

The impact of the proposal from each of the key viewpoint locations is detailed in Table 6-20 and discussed below.
### Table 6-20 Description of view impacts

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Distance zone</th>
<th>Overall rating</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint A – View from Henry Lawson Avenue (Figure 6-6)</td>
<td>M</td>
<td>M</td>
<td>FZ</td>
<td>M</td>
<td>Views of the proposed wharf interchange from Henry Lawson Avenue would have a moderate impact. Some views towards the harbour including the Harbour Bridge will be affected due to the location of the pontoon. However the proposed wharf interchange sits lower at certain tides and is located to the southeast opening up views towards Lavender Bay and Luna Park blocked by the current wharf. Impact on surrounding residences would be low due to the dramatic change in terrain. Residences at the eastern end of Henry Lawson Drive adjacent to the wharf are located above street level or on top of the sandstone ridge. Existing views from all residences would be retained towards the Sydney Harbour Bridge, Sydney Opera House, CBD and harbour more broadly.</td>
</tr>
<tr>
<td>Viewpoint B – View from Blues Point Reserve (Figure 6-7)</td>
<td>ML</td>
<td>ML</td>
<td>FZ-MZ</td>
<td>ML</td>
<td>Impact on views towards the proposed wharf interchange from Blues Point Reserve would be moderate to low. As the proposed wharf interchange reaches further into the harbour than the existing wharf, some views towards Luna Park and North Sydney Olympic Pool will be affected. However, by keeping the proposed wharf north of the McMahons Point foreshore line, views to the Sydney Opera House and Sydney Harbour Bridge will not be affected.</td>
</tr>
<tr>
<td>Viewpoint C – View from western edge of Lavender Bay including Sails on Lavender Bay restaurant (Figure 6-8)</td>
<td>M</td>
<td>H</td>
<td>FZ</td>
<td>MH</td>
<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td></td>
<td></td>
<td></td>
<td>The impact on views from the western residential embankment and in particular ‘Sails on Lavender Bay’ restaurant would be moderate. The proposed wharf interchange is located out from the existing wharf, potentially obscuring views to the Sydney Opera House. Views towards Dawes Point and Walsh Bay from the restaurant and western foreshore of Lavender Bay will be affected, filtered through the proposed gangway and pontoon depending on tidal levels. The impact on views from the western residential embankment is moderate as the wharf sits further into the harbour than the existing wharf. There will be some closing off of water views in the foreground from Sails Restaurant due to the angle and size of the uncovered pontoon.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Viewpoint D – View from public jetty at Quiberie Park on western edge of Lavender Bay (Figure 6-9)</th>
<th>L</th>
<th>L</th>
<th>MZ</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment</strong></td>
<td></td>
<td></td>
<td></td>
<td>Views to the proposed wharf interchange from the public north-western jetty would have a low impact. Views are fragmented by vessel moorings. Views towards Observatory Hill, the CBD and the finger wharves are maintained. Views from the residential properties of Lavender Bay would have a low impact by the proposed wharf interchange. Specifically views towards Walsh Bay and the Finger Wharves would be impacted by the shelter of the wharf and its proposed location extending from the foreshore. Views from the residential properties of Lavender Bay would have a low impact by the proposed wharf. Specifically views towards Walsh Bay and the Finger Wharves would be impacted by the larger structure of the wharf and its proposed location extending from the foreshore. However the change in location reduces the impact as the proposed wharf will be hidden by landside structures and will only be visible at certain tidal levels.</td>
</tr>
<tr>
<td>Viewpoint</td>
<td>Sensitivity</td>
<td>Magnitude</td>
<td>Distance zone</td>
<td>Overall rating</td>
</tr>
<tr>
<td>-----------</td>
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<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Viewpoint E – View from pedestrian promenade on eastern edge of Lavender Bay (Figure 6-10)</td>
<td>L</td>
<td>ML</td>
<td>MZ</td>
<td>ML</td>
</tr>
<tr>
<td>Viewpoint F – View from Dawes Point (Figure 6-11)</td>
<td>L</td>
<td>L</td>
<td>BZ</td>
<td>L</td>
</tr>
<tr>
<td>Viewpoint G – View from Sydney Opera House (Figure 6-12)</td>
<td>N</td>
<td>N</td>
<td>BZ</td>
<td>N</td>
</tr>
<tr>
<td>Viewpoint H – View from Walsh Bay (Figure 6-13)</td>
<td>L</td>
<td>L</td>
<td>BZ</td>
<td>L</td>
</tr>
</tbody>
</table>
The impact from this viewpoint is considered high. Clear unobstructed views are available along this section of the foreshore across open water towards McMahons Point. While the landside components of the proposed wharf replace an existing structure, and read as a collection of built elements on the foreshore, the waterside components of pontoon and gangway will introduce a new larger scale built element on currently open water.

The proposal would be visible from a range of points including the western side of Lavender Bay, Dawes Point, Walsh Bay and the Sydney Harbour Bridge (refer to Table 6-20 above).

Impacts on views within the foreground zone (viewpoint A and C) will be moderate to high moderate due to the change in scale and position of the proposal. The impact on views from Henry Lawson Avenue and surrounding residents (viewpoint A) is considered moderate, while the impact on views at Sails on Lavender Bay restaurant and residential areas (viewpoint C) to the west of the proposal is considered high due to the magnitude of the proposal.

Views of the proposal from Blues Point Reserve (viewpoint B) would span both the foreground and middle zones as a result of the proposal extending further into the harbour. Views from Blues Point reserve will be moderate as a result of new elements of the proposal extending into the middle zone (ie uncovered bridge, gangway and pontoon), however the overall scale of the proposal would be offset using materials neutral in tone, and the new pontoon sitting lower in the water compared to the existing wharf.

Views of the proposal in the middle zone (viewpoint D, E and I) would be filtered by vessel moorings and reduced through the shift in the location of the pontoon further out into Lavender Bay. As a result these impacts are considered low to high due to both the low sensitivity of the site allowing it to absorb change and the overall magnitude of the proposal.

Views of the proposal from the background zone (viewpoint F, G and H) would become less visible across these long range views and impacts are considered to be negligible to low as a result of the proposal.

Overall, the proposal would have a moderate impact on existing views and vistas.

### 6.8.3 Safeguards and management measures

The design of the proposal has been an ongoing process of consultation (refer to Chapter 5) and testing, based on an investigation of the following:

- Potential visual impact.
- Access
- Safety and security
- Buildability
- Material palette and character
- Architectural form and design
- Maintenance.

The sensitivity of the landscape character of the area demanded careful consideration to minimise the impact of any new elements. The essential elements of the wharf (waiting shed, bridge, gangway and pontoon) have been sited in response to potential impact on views and in consultation with the community (refer to Section 5). To minimise the scale of the wharf and to maximise open views the shelter has been located partly within the same footprint of the existing shelter and no roof structures are proposed for the bridge, gangway or pontoon. All of the wharf elements have been designed to retain simple clear lines that respond to the maritime setting.

Material selection for the wharf is based on standardised elements that visually create a family of wharves on the harbour. These materials have been selected for durability to reduce maintenance costs and to also fit within the character of the harbour generally.

Colour plays an important role in mitigating impact. Colour selection for materials and painting respond to the surrounding palette, are low in reflectivity, and complement the surrounding harbour environment. The proposed wharf would promote a unified palette of materials which, while responding to the maritime heritage and surrounding character, also separates the structure as a piece of architectural design.

Very little intervention is proposed for landside works ensuring that it has minimal impact on the character of the public domain. The palette for the public domain utilises similar materials to those existing for paving and changes to kerbs.

Further to the above measures which have been implemented within the proposal, the following management measures are proposed.

**Table 6-21 Landscape, visual and urban design and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape, visual and urban design</td>
<td>• During detailed design, the siting and layout of the wharf is to be prepared in accordance with Roads and Maritime Beyond the Pavement (Roads and Maritime Services 2014) and consider the UNESCO Sydney Opera House Buffer Zone.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• The final design is to ensure new structures are integrated with existing landside elements.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• The detailed design is to maintain and provide pedestrian connections and integrate other modes of transport.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• The detailed design is to incorporate the ‘suite’ of structures, fixtures and furniture developed for wharf upgrade program, ensuring wharf identity and ease of maintenance.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• The compound site and works area would be kept clean and clear of rubbish.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• Urban design principles will be integrated throughout the detailed design and construction of the proposal.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Landscape, visual and urban design</td>
<td>• The design of the wharf lights will be to Australian Standards.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• The wharf lighting will be designed to minimise impacts on existing residences through incorporating dimmers and time clocks so that lights are dimmed at the time of the last ferry and by facing lights towards the ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The wharf lights will be simple in design with minimal fixtures, and resistant to vandalism where possible.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.9 Non-Aboriginal heritage

The Statement of Heritage Impact at Appendix C outlines the history of the area and provides an assessment of the heritage significance of McMahons Point Wharf and heritage impacts as a result of the proposal. A summary of the findings of this report are provided below.

A passenger wharf was first constructed at McMahons Point sometime between 1860 and 1871 following the establishment of the North Shore Ferry Company in 1860. Records show that in 1871 the wharf was owned by the North Shore Ferry Company. Based upon limited available information, it is understood that the original wharf consisted of a short timber landing stage with timber waiting shed.

Upgrades to the landing stage and waiting shed were carried out in 1910. In 1930 the wharf was extended. Following the opening of the Sydney Harbour Bridge in March 1932 there was a decrease in demand for the ferries servicing the north shore.

The current wharf was constructed in 1973 and replaced an earlier single walkway and hinged ramp with a concrete deck over a timber sub-structure. Similarly to the current situation, the wharf included a waiting shed and stairs to the water. Minor repairs were made to the structure in 2002 after a ferry ran into it on New Year’s Day.
6.9.1 Heritage listings and significance

The proposal involves the removal of McMahons Point Wharf which is listed as an item of local significance under the LEP 2013 and on Roads and Maritimes (formerly NSW Maritime’s) section 170 (s170) register under the Heritage Act 1977.

McMahons Point Wharf is historically significant as the site of one of the original commuter ferry wharves on the north shore which has been in use as such since the 1870s.

It has been an important transport interchange since the 1870s, firstly connected with tram and then bus services. Its use was followed by the development of the vehicular ferry services to Blues Point. It has associations with the history of early private ferry companies serving the North Shore.

The wharf is associated with prominent local businessman and politician, Michael McMahon who was a strong advocate for his North Shore constituents and in particular, their need for reliable transport services.

The establishment of the wharf and the subsequent tramway had a considerable influence on the early development of the surrounding locality with regard to urban and built form as well as roads and transport routes. Indeed, most nineteenth century development on the North Shore follows transport routes leading from ferry wharves on the harbour.

The highly scenic setting of McMahons Point Wharf within Sydney Harbour provides the site with aesthetic value. This value is further reinforced by the impressive views from the site and encompassing the site featuring iconic sites such as the Sydney Harbour Bridge, the Sydney Opera House and Luna Park.

The fabric of the wharf dating from 1973 is considered to be of negligible heritage significance and as such it is considered to have a high tolerance for change or replacement.

Therefore the heritage significance of the McMahons Point Wharf is embodied by its location, relationship with the adjacent transport routes and its continuity of function including any physical evidence demonstrating its long history of use. Furthermore, its highly scenic visual setting is also considered to contribute to the heritage significance of the site.

A search of the Heritage Branch’s State Heritage Inventory, United Nations Education, Scientific and Cultural Organisation’s (UNESCO) World Heritage List, the Commonwealth National Heritage List, North Sydney LEP 2013, State Government Agency s170 registers and the SREP Sydney Harbour for listed heritage items was conducted on the 14 January 2015. Table 6-22 below displays the results of these searches for all items that have potential to be affected by the proposal. The remainder of the items are physically and/or visibly separated and therefore not likely to be impacted by the proposal.

Table 6-22 Listed heritage items within, adjacent and in the wider vicinity of the proposal

<table>
<thead>
<tr>
<th>Heritage item</th>
<th>Location</th>
<th>Significance</th>
<th>Listing/s</th>
<th>Proximity to proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 McMahons Point Wharf</td>
<td>McMahons Point</td>
<td>State</td>
<td>Roads and Maritime s170 Register</td>
<td>Within the proposal area</td>
</tr>
<tr>
<td>2 Sewerage Pumping Station No. 24 (SP0024)</td>
<td>King George Street, McMahons Point</td>
<td>State</td>
<td>Sydney Water</td>
<td>450 metres</td>
</tr>
<tr>
<td></td>
<td>Heritage item</td>
<td>Location</td>
<td>Significance</td>
<td>Listing/s</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------</td>
<td>------------------------------------------------------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>3</td>
<td>Seawall</td>
<td>2A Henry Lawson Avenue (9 East Crescent Street)</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>4</td>
<td>North Sydney bus shelter</td>
<td>Henry Lawson Avenue</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>5</td>
<td>Blues Point Tower</td>
<td>14-28 Blues Point Road</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>6</td>
<td>Blues Point Waterfront Group</td>
<td>Blues Point Road and Henry Lawson Drive</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>7</td>
<td>World War II Observation Post and Stone Stair</td>
<td>Blues Point Foreshore</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>8</td>
<td>Blues Point Foreshore Shelf</td>
<td>Blues Point Foreshore</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>9</td>
<td>Stone retaining wall</td>
<td>Blues Point Road (southern end of road reserve)</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>10</td>
<td>Bollard</td>
<td>Blues Point Road</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>11</td>
<td>Bollard with chain</td>
<td>Blues Point Road</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>12</td>
<td>Excavation</td>
<td>Blues Point Road</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>13</td>
<td>Steps with bollard</td>
<td>Blues Point Road</td>
<td>Local</td>
<td>LEP 2013</td>
</tr>
<tr>
<td>Heritage item</td>
<td>Location</td>
<td>Significance</td>
<td>Listing/s</td>
<td>Proximity to proposal</td>
</tr>
<tr>
<td>---------------</td>
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<td>--------------</td>
<td>-----------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>14 Blues Point vehicular ferry dock</td>
<td>Blues Point Road (south end of cul de sac)</td>
<td>Local</td>
<td>LEP 2013</td>
<td>150 metres</td>
</tr>
<tr>
<td>15 Former Tram Turning Circle and McMahons Point Ferry Wharf</td>
<td>Henry Lawson Avenue</td>
<td>Local</td>
<td>LEP 2013</td>
<td>Within the proposal area</td>
</tr>
<tr>
<td>16 Slipway and Site of Former Holmes’ Residence</td>
<td>1 Henry Lawson Avenue</td>
<td>Local</td>
<td>LEP 2013</td>
<td>80 metres</td>
</tr>
<tr>
<td>17 House</td>
<td>3 Warung Street, McMahons Point</td>
<td>Local</td>
<td>LEP 2013</td>
<td>140 metres</td>
</tr>
<tr>
<td>18 House</td>
<td>5 Warung Street, McMahons Point</td>
<td>Local</td>
<td>LEP 2013</td>
<td>129 metres</td>
</tr>
<tr>
<td>19 House</td>
<td>7 Warung Street, McMahons Point</td>
<td>Local</td>
<td>LEP 2013</td>
<td>120 metres</td>
</tr>
<tr>
<td>20 House</td>
<td>9 Warung Street, McMahons Point</td>
<td>Local</td>
<td>LEP 2013</td>
<td>105 metres</td>
</tr>
<tr>
<td>21 Conservation area – General</td>
<td>McMahons Point South</td>
<td>Local</td>
<td>LEP 2013</td>
<td>Within the proposal area</td>
</tr>
</tbody>
</table>

It should be noted that several historic shipwrecks are known to be located in Sydney Harbour; however, their exact locations are currently unknown. These include the *Native* (1850), *Robert Saywers* (1854), *Gem* (1880), *Cadet* (1912), *Esther* (1920) *Rodney* (1938), *Siesta* (1942), *Nereus* (1942), *Silver Cloud* (1942) and *Marlean* (1944). However, given the amount of dredging throughout Sydney Harbour, movement of sediment caused by intensive shipping in addition to natural tidal movement, it is considered highly unlikely that any historic shipwrecks remain submerged or buried within the McMahons Point Wharf area.
6.9.2 Potential impacts

Construction impacts

Land Based

There would be a temporary and moderate impact on the significance of the wharf during the construction period due to the closure of the wharf to all non-related construction vessels and the presence of a construction hoarding and equipment during construction, and its significance being for its long history of use and the scenic value of its surroundings.

The existing wharf built form is not considered to embody any heritage significance and as such, the impact of its removal is considered to be negligible.

There is potential for impacts on the former tram turning circle during upgrade works to the footpath or if the installation of electrical and/or water supply is required. However, this is considered unlikely as evidence suggests that the fabric of this item is located beneath the bitumen of Henry Lawson Avenue, outside of the construction area. Nevertheless, if installation of electrical and/or water supply or footpath upgrades is required in this area or any unexpected heritage fabric is uncovered during the works, the environmental safeguards at Section 6.9.3 would be implemented.

There would be negligible impact on the significance of the Sydney Harbour Bridge, Luna Park, and the Sydney Opera House as it is typical for construction works to be undertaken within view of these items and the separation distance from the proposal (minimum 350 metres).

There would not be any impacts to other items identified in Table 6.13 due to the separation distance of these items from the proposal, majority of which are located out of view of the wharf.

The removal of the existing wharf may result in the removal of the wharf from Roads and Maritime’s s170 heritage register. In accordance with section 170A of the Heritage Act 1977, the Heritage Council will be given written notice of the proposal no less than 14 days prior to removal of the wharf.

The top level of sandstone blocks from the seawall at the entrance to the wharf would be removed to allow construction of the new shelter and reinstated following construction of the proposal. As a result of the proposal there would be no impact to the seawall.

Water Based

There is an extremely low risk of impact to historic shipwreck material as it is considered highly unlikely that any historic shipwreck would remain submerged or buried given the natural tidal movements and of lack of sediment identified in the construction area (refer to Sections 6.1.2 and 6.2.1).

Safeguards and management measures to minimise land and water based impacts on non-Aboriginal heritage values are identified at Section 6.10.3.

Operation impacts

The removal of the existing wharf and replacement with the proposed wharf interchange in a similar location will have negligible impact on its significance which is for its long term use rather than fabric.

The replacement of the existing wharf over time is a common pattern identified in the historical development of commuter wharves in Sydney Harbour.

The introduction of the wharf interchange in a same location as the existing/original wharf and the maintenance of the use will safeguard the heritage significance of the site.

The form and materials of the new wharf will provide visual interest and sit comfortably in the scenic landscape which includes the Sydney Opera House, Sydney Harbour Bridge and Luna Park. Other items of significance are separated from the proposal and would not to be affected by the proposal.
Overall, it is considered that the function of the site will remain highly legible and the proposal will safeguard and maintain the heritage significance of the wharf. There would not be any adverse impacts on surrounding heritage items during operation. The proposed development is considered to be both reasonable and appropriate in terms of heritage.

There are no World Heritage sites located within the proposal area; however, it is worth noting that the Sydney Opera House World Heritage Site is located at Bennelong Point which is visible from McMahons Point. The scale and location of the proposed redeveloped of McMahons Point Wharf is such that there will be no impact on the universal heritage significance of this World Heritage Site and key views from the site will be unaffected.
### 6.9.3 Safeguards and management measures

#### Table 6-23 Non-Aboriginal Heritage safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Aboriginal heritage</td>
<td>• The removal of the existing wharf may result in the removal of the wharf from Roads and Maritime’s s170 heritage register. In accordance with section 170A of the <em>Heritage Act 1977</em>, the Heritage Council will be given written notice of the proposal no less than 14 days prior to removal of the wharf.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Non-Aboriginal heritage</td>
<td>• All relevant staff, contractors and subcontractors will be made aware of their statutory obligations for heritage under the <em>Heritage Act 1977</em>, through the site induction and toolbox talks.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Non-Aboriginal heritage</td>
<td>• All construction staff will be inducted in the Roads and Maritime Services <em>Standard Management Procedure - Unexpected Heritage Items Procedure (2015)</em> and will implement this procedure where necessary.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| Non-Aboriginal heritage     | • If, during the course of development works, further suspected non-Aboriginal cultural heritage material, including historic shipwrecks, are discovered, work will cease in that area immediately.  
  • The Heritage Branch, Office of Environment and Heritage (02 9873 8500) will be notified and works only recommence when relevant permits and an appropriate management strategy instigated. | Project manager | Construction |
### Impact

<table>
<thead>
<tr>
<th>Non-Aboriginal heritage</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Heritage information will be placed on site during the construction phase to interpret the historic development and use of McMahons Point Wharf. Information will be in the form of heritage images and text on construction phase hoarding, or laminated posters put up beside general proposal information on site.</td>
<td>Project Manager</td>
<td>Construction</td>
<td></td>
</tr>
</tbody>
</table>
| Non-Aboriginal heritage | • A detailed archival record will be made of wharf prior to the commencement of wharf removal works in accordance with the publication *How to Prepare Archival Records of Heritage Places* (Heritage Office 1998)  
• Copies of the record will be submitted to North Sydney Council, the NSW Heritage Division library, as well as being offered to the NSW State Library. | Project manager | Pre-construction |

### 6.10 Aboriginal heritage

#### 6.10.1 Policy setting

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010) provides a framework to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether an Aboriginal Heritage Impact Permit (AHIP) is required. In the cases where an AHIP is required, Aboriginal community consultation must be undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010).

The Road and Maritime’ Procedure for *Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime, 2011) (PACHCI) incorporates all relevant Environment Protection Authority (EPA) and OEH Aboriginal heritage guidelines and requirements in a staged procedure. The due diligence process outlined in section 8 of the Due Diligence Code of Practice for the *Protection of Aboriginal Objects in New South Wales* (DECCW, 2010) has been considered and it is concluded that an application for an AHIP is not necessary in this case.

In accordance with the PACHCI Stage 1, the Roads and Maritime Aboriginal Cultural Heritage Advisor (Sydney Region) has considered the proposal and has agreed there is no requirement to proceed to Stage 2 (Appendix C), which would involve a desktop assessment, archaeological site survey and Aboriginal consultation.
6.10.2 Existing environment

The Port Jackson area was the traditional country of the coastal Darug speaking Aboriginal people, who were divided into land-owning clan groups, with a subsistence economy based on hunting, fishing and gathering. The area would have had abundant food resources in the sea, wetlands, forests and woodlands and supported a large Aboriginal population.

The Aboriginal history of Port Jackson is still apparent, with Aboriginal names for many headlands and other features around the harbour. Since the 1970s there has been a considerable amount of archaeological research and site recording. Despite extreme levels of landscape modification, the Port Jackson area still contains numerous archaeological sites, including middens, artefact scatters, burials, scarred trees, rock shelters with art and/or cultural deposit, axe grinding grooves and rock engravings, however many of these have been destroyed in the past with development of the harbour.

Along the east coast of Australia, including the Sydney Basin region, the majority of Aboriginal sites are found within close proximity to water sources, such as deflation basins and swamps. It is possible that this may be the result of increased ground surface visibility or survey sample bias in these areas.

The terrain and landform in the vicinity of the proposal is modified which reduces the likelihood of any sites being present. Shell middens are common around coasts and estuaries, but the water/land interface has been severely altered and are more likely back from the water’s edge in more sheltered areas.

Engravings and axe grooves may be present if large flat sandstone slabs occur in the area and rock art or cultural deposits may be present where there are rock overhangs in low cliffs. Bora grounds and stone arrangements are fragile sites, unlikely to have survived colonisation. Places of spiritual, cultural or historical significance to Aboriginal people may be present in the sea or on land, but knowledge of these tends to be held orally and requires consultation with relevant Aboriginal knowledge holders.

The area surrounding McMahons Point Wharf is highly disturbed having been developed over a long period of time including reclamation of the shore, major alterations of adjacent sandstone cliffs for residential development, and the construction of roads. It is highly unlikely that unknown aforementioned middens and Aboriginal rock shelters would exist within the vicinity of the wharf.

A search of Aboriginal Heritage Information Management System (AHIMS) was conducted on 22 November 2013 within a 2.5 kilometre radius (plus 50 metre buffer) of the proposal (Appendix C). A total of 87 Aboriginal sites were recorded within this area. None of the identified sites were located within the immediate vicinity of the proposal area.

6.10.3 Potential impacts

Potential impacts on Aboriginal heritage relate to previously unknown Aboriginal objects in areas of ‘potential’. Areas of potential are usually undisturbed areas of ground. McMahons Point Wharf retains none of the original landscape where Aboriginal objects would usually be found and no Aboriginal sites have been recorded near the site.

The proposal would therefore not impact any known Aboriginal objects or declared Aboriginal places. Based on the low potential for previously unknown Aboriginal objects to be located within the proposal area, no further Aboriginal assessment is required.
6.10.4  Safeguards and management measures

Table 6-24  Aboriginal Heritage safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal heritage</td>
<td>- If the scope of the proposal changes, the Roads and Maritime Aboriginal cultural heritage advisor, Sydney, and the Roads and Maritime environment staff must be contacted to reassess any potential impacts on Aboriginal cultural heritage.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

6.11  Hazards assessment

6.11.1  Potential impacts

Environmental hazards resulting from the construction of the proposal, and the identification of measures to avoid, mitigate or manage these risks, are addressed throughout Chapter 6.

Hazards arising from incidents during construction of the proposal and during operation could also pose a risk to human health, as well as that of the environment. Such potential risks and appropriate safeguards and management measures are discussed below.

Construction

The following hazards and risks would be associated with the proposal during construction:

- Construction materials, wastes and/or objects have the potential to fall from the wharf into Sydney Harbour causing water pollution and risk to human health
- Construction materials, wastes and/or objects have the potential to fall from construction barges or other construction vessels into Sydney Harbour causing water pollution and risk to human health
- A spill of hydraulic fluid or fuel used in the construction plant or equipment has the potential to enter the waters of Sydney Harbour
- Construction workers have the potential to fall from the wharf or vessels in Sydney Harbour potentially resulting in physical injury or drowning.

Operation

The proposal would improve the ease of maneuvering for ferries approaching and departing from the McMahons Point Wharf as the berthing faces would be located within deeper water. This would be expected to minimise the possibility of incidents such as vessels hitting the seafloor.

The proposal would increase wharf safety measures, which would reduce the potential for incidents impacting on the environment and human health.
6.11.2 Safeguards and management measures

Table 6-25 Hazards safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazards</td>
<td>A life preserving ring and appropriate first aid provisions will be located within the compound and on all barges during the construction period.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>

It is considered that all other potential for adverse hazards and risks are effectively addressed by the application of the individual impact area safeguards recommended throughout Chapter 7.

6.12 Air quality

6.12.1 Existing environment

The existing air quality near the location of the proposal is primarily influenced by emissions from motor vehicles, commercial operations and residential activities. Air quality is also influenced by the prevailing weather and climatic conditions, bushfires and other natural factors such as pollen.

The two air pollution issues of primary concern in Sydney are photochemical smog and particle pollution. Particle pollution is seen as brown haze usually present in the cooler months of the year. Particle pollution comprises airborne particles from human-made emissions and other natural particle sources such as sea salt, dust, pollen and bushfires. Photochemical smog is formed when sunlight reacts with chemical compounds including ozone and oxides of nitrogen, and is seen as a whitish haze (City of Sydney, 2012).

The nearest OEH air quality monitoring stations to the site are located in Rozelle and Lindfield. These monitoring stations, along with stations at Chullora and Lindfield make up the Sydney East region. A review of air quality monitoring data for Sydney East region for the month of October 2015 shows pollutants within the range of good to fair, with the exception of 15 October 2015 which showed a spike of the regional air quality index within the range of very poor (OEH, 2015). Fair conditions are generally associated with bushfires and controlled back burning that were known to be occurring across the region at the time.

The closest Bureau of Meteorology (BoM) monitoring station to the location of the proposal is at Observatory Hill. Data from the Bureau of Meteorology (BoM, 2015) reports that the average annual rainfall recorded at Observatory Hill is 1213 millimetres.

According to the Bureau of Meteorology (BoM, 2014) the average annual wind speed ranges between about 10.6 (at 9am) to 16.6 (at 3pm) kilometres per hour. Wind direction and speed varies throughout the day, usually being calmer in the morning. Wind speed and direction also varies throughout the year.

6.12.2 Potential impacts

Construction impacts

During the construction of the proposal temporary impacts on air quality may arise from:

- Minor generation of particles and dust from wharf removal works
- Minor emissions (primarily diesel exhaust) from plant and machinery
- Minor emissions from construction traffic and water vessels.
Operation impacts

The level of operation of the ferry service would not significantly change and no additional impacts to air quality are expected from the operation of the proposal.

6.12.3 Safeguards and management measures

Table 6-26 Air quality safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
</table>
| Air emissions during construction   | • Measures to address air quality impacts will be incorporated into the CEMP and implemented throughout the construction period. As a minimum, the following measures will be included:  
  • Covering of all loaded trucks and vessels  
  • Machinery to be turned off rather than left to idle while not in use  
  • Maintenance of all vehicles, including trucks and vessels entering and leaving the site in accordance with the manufacturers’ specifications to comply with all relevant regulations  
  • Maintenance of all plant and equipment to ensure good operating condition and exhaust emissions comply with the Protection of the Environment Operations Act 1997  
  • Maintaining the work site in a condition that minimises fugitive emissions such as minor dust.                                                                 | Project Manager | Pre-construction and construction |

6.13 Social and economic issues

6.13.1 Existing environment

McMahons Point is a small predominately residential suburb located on the lower north shore of Sydney. It is bounded by the suburbs of Lavender Bay and North Sydney to the north, Milsons Point to the east and Waverton to the west. The waterways of Lavender Bay Sydney Harbour and Berrys Bay surround McMahons Point to the east, south and west respectively.

Sydney Ferries provide frequent services to and from McMahons Point connecting with various wharves between Parramatta and Circular Quay on the Woolwich/Balmain, Parramatta River, and Darling Harbour/Balmain East routes. McMahons Point Wharf predominately serves local residents and commuters although there would also be some use by tourists. The service operates from around 7am to 11.30pm on weekdays and between 7.20am and 11pm on weekends and public holidays.
The 2011 Census reported that 177 residents use the ferry as part of their commute to work (ABS, 2011).

A bus stop is located at the end of the turning circle, adjacent to the wharf. This bus stop provides services to nearby destinations including, Lane Cove, Crows Nest, Greenwich, Wollstonecraft, Waverton, North Sydney, Milsons Point and Kirribilli. Bus operate from McMahons Point frequently between Monday to Saturday, with no buses in operation on Sundays and public holidays. Further information on land transport is provided at Section 6.6.

There is a limited amount of car parking (four spaces) within the vicinity of McMahons Point Wharf. These spaces are time restricted to 30 minutes and therefore would not be used by commuters. The majority of commuters would walk to the wharf along Henry Lawson Avenue or via a pathway that connects Warung Street and East Crescent Street and Henry Lawson Avenue at Sails on Lavender Bay.

The existing shelter provides a covered waiting area for commuters and includes seating, and weather protection screens to the east, west and south. CCTV, a garbage bin, lighting and information boards are also located within the shelter.

McMahons Point Wharf is currently a single berthing face orientated to the east. It can be used by commuter ferries, private vessels, water taxis and commercial operators to pick up and set down passengers, with priority access given to ferries.

During times when water level at the site is low, access to vessels is via timber steps at the wharf. As such, the existing wharf does not meet the requirements of the DDA or current legislative standards for disabled access.

Public infrastructure in the vicinity of the wharf includes, bench seating, street lighting, a bus stop, and a pedestrian footpath along the southern side of Henry Lawson Avenue.

Residential areas at McMahons Point are located to the north west of the wharf and comprise a mixture of attached and detached dwellings, including residential apartment buildings. The nearest residences are about 40 metres to the west of the wharf at the residential apartment building ‘La Corniche’. Residential areas are also located about 300 metres from the wharf on the eastern side of the Lavender Bay at Milsons Point.

Sails on Lavender Bay restaurant is the only commercial use within the direct vicinity of the wharf. It is open for lunch between Monday to Friday and Sunday, and for dinner from Monday to Saturday. Other commercial uses are located at Milsons Point about 300 metres east of the wharf. These include Luna Park, commercial offices and restaurants.

Employment opportunities within the vicinity of the wharf are limited to the commercial uses noted above.

The waterway within Lavender Bay is largely occupied by vessels attached to swing moorings and a number of private jetties along the western shoreline of Lavender Bay. However given that the nearest swing mooring and jetty is about 100 metres from the wharf no impacts are expected as a result of the proposal.

Fishing is currently permitted from the existing McMahons Point Wharf. There are no commercial fishing operations or aquaculture activities operating in Lavender Bay.

6.13.2 Potential impacts

Construction

The existing McMahons Point Wharf would be closed and removed prior to construction of the proposed new wharf. As a result, there would be temporary disruptions to commuters as ferry and water taxi services would not operate from McMahons Point Wharf for up to six months during the construction period for the new wharf. During this time, ferry commuters would need to access alternative transport options including buses and/or private vehicle use (refer to Section 6.6).
Once the proposed wharf is opened it would operate with two berthing faces compared to the existing wharf which currently operates with only one berthing face.

The amenity and character of the McMahons Point foreshore in the vicinity of the wharf would be impacted as the site would be a construction zone. This would temporarily change the character of the built and natural environment through changes to the area’s visual aesthetics, air quality and noise levels.

The temporary compound would be surrounded by hoarding to reduce noise, visual clutter and safety issues to the public. Views would be temporarily disrupted by construction hoarding, vessels and equipment which would be of a greater height and scale than the existing wharf would also be located at the site. This would impact on the amenity of the area which could discourage its use.

Access to the foreshore by the public would be impacted during construction due to the location of the compound within a small portion of Blues Point Reserve adjacent to the wharf (refer to Figure 3-1). This impact would be minor given that access to the remainder of Blues Point Reserve would not be affected as a result of the proposal.

The location of the construction compound would require the temporary relocation of the bus stop within the near vicinity of the existing stop.

Noise from the construction activities is likely to temporarily cause annoyance and disturbance to surrounding residences, Sails on Lavender Bay restaurant, and users of the bay and park. Noise impacts on surrounding receivers during the works would vary over the construction period depending on the type of work being carried out at the time (refer to Section 6.4).

At times, intricate lifts and piling works would be carried out during night time periods from 11pm and may cause awakening, however such works is not expected to cause impacts on health and wellbeing.

The amenity and views (refer to Section 6.8) from Sails on Lavender Bay restaurant would be reduced due to construction noise and the presence of a construction zone and vessels within the outlook from the restaurant. Safeguards have been included to minimise noise during lunch service times and no work is proposed during dinner service. Access to Sails on Lavender Bay restaurant would remain open during the construction period. People who would normally visit the restaurant using ferry services may choose not to visit the restaurant whilst the wharf is closed. As such, patronage and the profitability of the business may be reduced during construction.

The construction site would be lit at night for safety. Light spill from the site may cause annoyance to people in nearby properties. These impacts are likely to be minor given that there is already lighting at night to the existing ferry wharf and adjoining park. Lights would be directed away from residential areas to minimise potential light spill.

The additional construction traffic expected in the area is considered minor and would be unlikely to affect the capacity of the road network. Potential impacts associated with construction vehicles and vessels at the site would be mitigated through the preparation and implementation of a traffic control plan. This is discussed further at Section 6.6.

**Operation**

Future demand for services at McMahons Point ferry interchange may increase due to the overall upgrade of Sydney Harbour commuter ferry wharves which aims to improve access, efficiency and amenity of the ferry system. The proposal would contribute to enhancing water transport in Sydney Harbour by enhancing access to commuter ferry services.

The proposal would enhance the role of the harbour as both a working harbour and an effective transport corridor by improving access to water-based public transport facilities.
The proposal would provide a continuous path of travel, for people with a disability and other mobility issues, from the footpath to the pontoon for 80 per cent of all tide. The gradient of the gangway would vary according to the tides and the pontoon would be level. The width of the wharf structures would enable two wheelchair users to pass each other whilst travelling in the opposite direction. The pontoon would also enable a wheelchair user to turn 180 degrees in an independent and equitable manner. As a result people with a disability would be able to access and use the ferry wharf in an independent and dignified manner. In doing so the proposal would contribute to improving access to community services, facilities and social networks. It would help facilitate access from the adjoining residential area to a range of cultural sites around the harbour.

The proposal would facilitate ferry operations and reduce boarding times. The proposal would contribute to improved commuter experience by providing a practical, functional and robust ferry wharf with appropriate waiting areas, passenger seating, standing and shelter while allowing for the enjoyment of good weather, harbour views and aquatic activity. The wharf is not designed to be a fully weather protected structure. The design has balanced protection from the weather during high wind and rain events while also allowing cross-breezes during extreme heat periods.

The overall visual impacts of the proposal would be moderate. These impacts would be minimised through the high quality design and the selection of appropriate materials to maximise visibility through the wharf structure. Visual impacts and proposed management measures are discussed further in Section 6.8.

Views from the dining area of Sails on Lavender Bay restaurant may result in some closing off of water views in the foreground due to the proposed wharf interchange, however the impact on these views are considered moderate. With improved access at the proposed wharf interchange there is the potential for increased patronage at the restaurant.

The additional berthing face would reduce congestion. This would be expected to minimise the possibility of incidents such as the collision of vessels.

Vandalism would be reduced with the use of appropriate materials, surfaces and designs. Improved security would also reduce the unauthorised and inappropriate use of the wharf and its facilities. These factors would contribute to a greater sense of safety, particularly for night time commuters.

Impacts on nearby properties from light spill would be minor. All lights on the wharf would meet Australian Standards which include relevant light spill criteria and would incorporate dimmers and timers so that lights would be dimmed soon after the last ferry of the day. The installation of appropriately designed lighting has been included as a safeguard and mitigation measure.

There would be no decrease in recreational fishing opportunities at the proposed wharf interchange.

The proposal would reduce wharf maintenance costs through scales of economy achieved through standardising wharf design, construction materials and fittings throughout Sydney Harbour.
### 6.13.3 Safeguards and management measures

**Table 6-27 Social and economic safeguards and management measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>Social and economic</td>
<td>• North Sydney Council and the local community are to be kept informed about the details of the works, construction progress, wharf closure, changes to public transport arrangements, and other impacts during the construction period.</td>
<td>Project Manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Social and economic</td>
<td>• An internet site and free call phone number for proposal enquires will be established for the duration of the works. Contact details will be clearly displayed at the site throughout the construction period. Directions will be provided on how to make an enquiry or register a complaint regarding the works.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Social and economic</td>
<td>• An enquiry and complaint tracking system will be established. Any enquiries or complaints will be acknowledged within 24 hours of being received</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Social and economic</td>
<td>• All operational wharf lighting and signage is to comply with the Disability Standards for Accessible Public Transport (2002).</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Social and economic</td>
<td>• The new wharf will be constructed to be compliant with current legislative standards for the provision of access for a person with a disability.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>Social and economic</td>
<td>• The construction site will be lit at night for safety. Lights will be downward facing so that light is not directed toward nearby residences.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
6.14 Waste management

6.14.1 Existing environment
Public waste bins are provided at the existing wharf and are managed as part of existing wharf operations. There is the potential for litter to enter Sydney Harbour from existing wharf activities and from use of Blues Point Reserve.

6.14.2 Potential impacts

Construction impacts
Construction activities would generate various waste streams. Potential wastes include:
- Solid waste from the removal of the existing wharf
- Waste fuels, oils, liquids and chemicals
- Packaging wastes such as card board, timber, paper and plastic
- General garbage and sewage from the construction compound.

Operation impacts
One of the objectives of the Sydney Commuter Ferry Upgrade Program is to increase patronage of the Sydney Harbour ferry network. The proposal would likely lead to an increase in patronage as a result of improved access and generally improving the wharf facility. As a result, increased waste may be generated but incidences of littering is not expected to increase given that waste management is likely to improve with the installation of new garbage receptacles and improved facilities.

6.14.3 Safeguards and management measures
It is considered that the safeguards and management measures for water quality impacts at Section 6.3.3 and impact on aquatic ecology at Section 6.5.3 are sufficient to appropriately manage waste.

6.15 Climate change
The Intergovernmental Panel on Climate Change has produced climate change projections. In Australia, both the Commonwealth Scientific and Industrial Research Organisation and the BOM have produced regional downscaled projections for Australia from these projections. In 2008 the NSW Government published refined climate change projections for each region in NSW, including the Sydney region. In summary, climate change predictions for Sydney, including the location of the proposal, are:
- More intense extreme rainfall events
- Higher average temperatures
- More frequent occurrence of extreme temperatures.

The NSW Coastal Planning Guideline: Adapting to Sea Level Rise (DoP, 2010) applies to the proposal. This guideline requires that the following eight criteria be considered when designing development proposals:
1. Development avoids or minimises exposure to immediate coastal risks (seaward of the immediate hazard line)
2. Development provides for the safety of residents, workers or other occupants on-site from risks associated with coastal processes
3. Development does not adversely affect the safety of the public off-site from a change in coastal risks as a result of the development
4. Development does not increase coastal risks to properties adjoining or within the locality of the site
5. Infrastructure, services and utilities on-site maintain their function and achieve their intended design performance
6. Development accommodates natural coastal processes
7. Coastal ecosystems are protected from development impacts
8. Existing public beach, foreshore or waterfront access and amenity is maintained.

In October 2009 the NSW Government released its *NSW Sea Level Rise Policy* (DECCW, 2009a). The policy provided sea level rise planning benchmarks as follows:

- 40 centimetres by 2050
- 90 centimetres by 2100.

On 8 September 2012, the State Government withdrew these benchmarks in order to provide more flexibility in considering local conditions when determining future hazards. Responsibility for adopting sea level rise projections for use in planning was transferred back to local government.

In the absence of an adopted sea level rise benchmark for the locality of the proposal, a desktop analysis using a range of Global Climate Models and a ‘best estimate’ median result has been undertaken. The results indicate an estimated 50 year sea level rise benchmark of 516mm. This sea level rise allowance has been adopted for the proposal.

The approximate Mean High Water Mark (MHWM) for the site is around 1.5 metres above the zero of Fort Denison Tide Gauge (ZFDTG) (0.555 metres AHD). This converts to about RL0.6. The adopted 50 year sea level rise allowance adopted for the proposal is therefore RL1.066 in 2064.

### 6.15.1 Potential impacts

Climate change could potentially affect the proposal through changed average conditions and extreme events.

**Construction impacts**

Climatic factors would not constrain construction of the proposal except during adverse weather conditions such as prolonged heavy rain or high winds which may occur during the construction period. These may delay the completion of construction.

Construction would contribute to climate change through the generation of greenhouses gases from construction activities. Greenhouse gases would be generated through the use of fossil fuels by construction plant and equipment, transportation of personnel and materials and the embodied carbon in the materials used such as concrete and steel.

Changes to ferry operations at the site would occur during construction of the proposed wharf interchange, as no ferries would access the site for up to six months. No other vessels (e.g. water taxis) would have access to the site during construction of the proposal.

**Operation impacts**

The proposal has minimised its exposure to climate change risks by including a fixed gangway and floating pontoon and which have been designed to provide appropriate clearances of existing tides, storm surge, sea and wave action whilst also considering projected sea level rise over the next 50 years.

The proposal does not include the addition of any fixed structure within the water. The floating pontoon would be able to rise and fall with the tide including any change in sea level. The new piles would provide a freeboard of more than one metre above the adopted 50 year sea level (RL1.066) and is therefore suitably designed to accommodate the adopted sea level rise benchmarks for the proposal.
More extreme and more frequent heat events as a result of climate change may lead to more rapid degradation of the wharf structures. This may result in additional maintenance requirements.

Operation of the wharf will remain much the same as existing operations. There would be some greenhouse gas emissions emitted during maintenance of the wharf, although maintenance requirements would be less than for the existing wharf structure.

Any climate change impacts of constructing, operating and maintaining the proposal are considered minor.

### 6.15.2 Safeguards and management measures

It is considered that the potential for adverse impacts to and by climate change are effectively addressed by the design of the proposal and the application of the safeguards summarised in Chapter 7.

### 6.16 Cumulative impacts

The incremental effect of multiple sources of impact (past, present and future) is referred to as ‘cumulative impacts’ (Contant and Wiggins 1991; Council on Environmental Quality 1978). Consideration of cumulative impacts in the context of environmental assessment is necessary so that impacts associated with the proposal and other activities within the region are examined as a whole.

A search of North Sydney Council’s development application tracker and the Department of Planning and Environment’s development assessment tracking system on 11 November 2015 identified a number of developments within McMahons Point. Majority of these were minor such as alterations and additions to existing dwellings.

No developments are identified as being within 200 metres of the proposal, with the nearest development application located at 1 Henry Lawson Avenue for the removal of above ground structure and construction of a four storey building comprising commercial use of lowest level and dwelling on three levels above and the restoration of slipways. This application was lodged 1 September 2015 and is currently being assessed by the council. There are also numerous developments under assessment or recently approved by North Sydney Council that are outside of McMahons Point.

Ongoing vessel movements within McMahons Point would have the potential to contribute to cumulative impacts during construction of the proposal.

No major work is planned for any other commuter ferry wharves on the same ferry route as McMahons Point Wharf during the construction period. However, Roads and Maritime is planning the progressive upgrade of commuter ferry wharves throughout Sydney Harbour under the Sydney Commuter Ferry Upgrade Program.

### 6.16.1 Potential impacts

The proposal forms part of the Sydney Commuter Ferry Wharf Upgrade Program which would create practical, functional and robust ferry commuter wharves within Sydney Harbour. The positive cumulative impacts of the proposal would result in improvements to:

- Safety for commuters
- Facilities for recreation
- The public domain and quality of commuter experience
- Safer travelling conditions
- Improved travel times
- Generally improved customer experience due to upgraded facilities
- Unifying and identifying the harbour wharves and the ferry commuter system.
Given that there have been no other proposed developments identified within 200 metres of the wharf, cumulative impacts on air quality, amenity (noise and visual), or during the construction period would be minor or negligible. There may be increased pressure on the local road network during this time however this is not expected to have more than a minor cumulative impact on the existing road network.

Given that no major developments have been identified within the vicinity of the proposal or on Henry Lawson Avenue, cumulative negative impacts during the construction period are expected to be negligible to minor. These impacts are listed below.

**Air quality**

- There would be a potential minor short term cumulative increase in exhaust emissions from construction proposals within the region.

**Climate change**

- Developments within the region would contribute to climate change through the generation of greenhouses gases from construction activities. Greenhouse gases would be generated through the use of fossil fuels by construction plant and equipment, transportation of personnel and materials and the embodied carbon in the materials used such as concrete and steel. The climate change impacts of constructing, operating and maintaining the proposal are considered minor.

### 6.16.2 Safeguards and management measures

It is considered that the potential for adverse cumulative impact is effectively addressed by the application of the individual impact area safeguards summarised in Chapter 6.

### 6.17 Summary of beneficial effects

The benefits of the proposal include:

- Improved commuter facilities by providing a practical, functional and robust ferry commuter wharf with appropriate waiting and standing areas, passenger seating and shelter while allowing for the enjoyment of good weather, harbour views and aquatic activity
- Encouraging an increase in commuters using the upgraded wharf services and ferry services once the redevelopment is completed and the wharf operational
- Improved access for people with a disability
- Reduced wharf maintenance costs
- Safeguard and maintain the heritage significance of McMahons Point Wharf through incorporating a 50 year design life
- Provision of a wharf that is resilient to projected sea level rise due to climate change
- Contribute to achieving a consistent thematic design for all upgraded wharves in Sydney Harbour, to unify and identify the harbour wharves and ferry commuter system
- Improved water safety as berthing faces would be located in deeper water reducing the risk of vessels hitting the seafloor
- Reduced vandalism with the use of appropriate materials, surfaces and designs
- Improved access from the adjoining residential area to a range of cultural sites around the harbour
- Improved interrelationship of waterway and foreshore uses through more effective access to water-based public transport
- The additional berthing face would reduce congestion. This would be expected to minimise the possibility of incidents such as the collision of vessels.
6.18 Summary of adverse effects

The main adverse effects of the proposal include:

**Land surface issues**
- Disturbance of sediments on the harbour bed where piles are installed and where construction vessels anchor, especially in shallow waters.

**Water quality**
- Potential for water pollution as a result of materials, spills or waste accidentally entering the waters of Sydney Harbour during removal and/or transportation
- Increased water turbidity due to the removal and installation of piles and the operation of construction vessels, especially in shallow waters.

**Noise and Vibration**
- There would be exceedances of the noise criteria by up to 18 dB(A) for residential receivers during the daytime period during construction
- There would be exceedances of the noise criteria by up to 44 dB(A) for residential receivers during the night time period during construction
- There is potential for an exceedance OEH’s sleep disturbance screening criteria of up to 23 dB(A) during intricate lifts (11pm to 7am) and 44 dB(A) during hammering of piles (5am to 7am) which could cause awakening
- With windows open, there is potential that noise levels at the facade of the nearest sensitive receiver during the night time period would be up to 78 dB(A) during intricate lifts (11pm to 7am) and 99 dB(A) during piling (5am to 7am) and could potentially affect the health and wellbeing of nearby residents
- There would be exceedances of the noise criteria by up to 26 dB(A) during piling works at Sails at Lavender Bay restaurant.

**Landscape, visual and urban design**
- Impact on landscape character would be moderate
- The proposed replacement wharf would be visible from a range of points including the eastern side of Lavender Bay, Dawes Point, Walsh Bay, the Sydney Opera House and Sydney Harbour Bridge
- Overall views within the foreground zone would have a moderate impact, while viewpoints in the middle and background zones would have a moderate to low impact.

**Flora and fauna**
- Temporary loss of marine organisms attached to the submerged surfaces of piles to be removed
- Temporary loss of rocky reef habitat to piling operations
- Loss of organisms living in the sediments of the seabed (i.e. benthic biota) due to the placement of proposed new piles
- Disturbance of aquatic habitats from construction vessel propeller wash.

**Non-Aboriginal heritage**
- There would be a temporary and minor impact on the heritage significance of the existing wharf due to the presence of construction hoarding, materials and equipment.
Socio-economic
• There would be temporary disruptions to commuters as ferry and water taxi services would not operate from McMahons Point Wharf for up to six months during the construction period. Commuters may choose to use an alternative wharf, or use public buses or vehicles during this time. This would be likely to result in an increase in commuter travel times.

Land transport and parking
• There would be additional traffic due to about 15 vehicle movements per day comprising sub-contractors and concrete trucks travelling to and from the construction site
• Impacts to parking availability would occur due to the parking of concrete trucks and construction vehicles at Henry Lawson Avenue. However, there may be a decrease in parking demand from those who would normally use McMahons Point Wharf whilst it is closed.

Water transport
• Increased water-based traffic within Sydney Harbour due to construction vessels transporting plant, equipment, materials and personnel between an off-site facility within Sydney Harbour, and the construction site
• Impact to all non-construction related vessels that would be prohibited to enter the area of the construction work site.

Waste management
• Generation of waste through the removal of McMahons Point Wharf and disposal of existing wharf structures that are unable to be re-used or recycled.
7 Environmental management

This chapter describes how the proposal will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Roads and Maritime Services QA specifications. A summary of site-specific environmental safeguards is provided as detailed in Chapter 6 and the licence and/or approval requirements required prior to construction are also listed.

7.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, such management measures would be incorporated into the detailed design and applied throughout the construction period and during operation of the proposal.

A CEMP would be prepared to describe safeguards and management measures identified. This plan would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The plan would be prepared prior to construction of the proposal and must be reviewed and certified by Roads and Maritime, prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the ‘Guideline for the Preparation of Environmental Management Plans’ (DIPNR, 2004).

7.2 Summary of safeguards and management measures

Environmental safeguards outlined in this document would be incorporated into the CEMP and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 7-1.
**Table 7-1** Summary of site specific environmental safeguards

<table>
<thead>
<tr>
<th>No.</th>
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<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
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<tbody>
<tr>
<td>1</td>
<td>General</td>
<td>• All environmental safeguards must be incorporated within the following documents:</td>
<td>Project manager</td>
<td>Pre-construction</td>
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<tr>
<td></td>
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<td>• Detailed design stage</td>
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<td></td>
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<td>• Contract specifications for the proposal, where possible</td>
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<tr>
<td></td>
<td></td>
<td>• Contractor’s Environmental Management Plan</td>
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<tr>
<td></td>
<td></td>
<td>• The CEMP will be completed by the Contractor and endorsed by Roads and Maritime prior to any works commencing on the site.</td>
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<tr>
<td>2</td>
<td>General</td>
<td>• All businesses and residences likely to be affected by the proposed works must be notified at least 5 working days prior to the commencement of the proposed activities</td>
<td>Project manager</td>
<td>Pre-construction</td>
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<tr>
<td></td>
<td></td>
<td>• Ausgrid and Sydney Water would be consulted during construction and where necessary applications for connections would be made.</td>
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<tr>
<td>3</td>
<td>General</td>
<td>• Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors.</td>
<td>Contractor</td>
<td>Pre-construction and during construction as required.</td>
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</table>
| 4   | General                 | • In accordance with standard Sydney Water requirements:  
  • Space allocations and other requirements set out in the *Guide to Codes and Practices for Streets Openings* will be adhered to  
  • Minimum clearances will be maintained from water and sewerage assets as set out in the *Water Supply Code of Australia* and the *Sewerage Code of Australia* (Sydney Water Editions)  
  • ‘Dial before you dig’ searches will be undertaken prior to any excavations.                                                                                                   | Project manager | Pre-construction and construction |
| 5   | Water based land surface| • Silt and sediment controls will be established prior to any disturbance of the land surface. Controls will be in accordance with edition 4 of ‘Managing Urban Stormwater, Soils and Construction’ (NSW Government, 2004) (the blue book). | Project manager | Pre-construction             |
| 6   | Water based land surface| • A silt curtain, extending from a minimum of 100 millimetres above the water line and extending no less than 2.5 metres below sea level will be installed around the entire proposal area at McMahons Point prior to commencement of works that disturb the seafloor  
  • If excessive turbidity of the water is observed during removal of the first few piles, a second, moveable silt curtain will be installed around the piles being removed during each day of operation | Project manager | Pre-construction and construction |
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| 7   | Water based             | • During removal of the existing wharf, an additional silt curtain, extending from a minimum of 100 millimetres above the water line and extending to the seabed (or extending no less than 2.5 metres below sea level) will be set parallel to the east facing seawall at the demolition site. This will be set at about two metres below the lowest astronomical tide (LAT) contour  
• This silt curtain will extend under the existing ferry wharf footprint and for about 20 metres parallel to the shore from the extremities of the existing wharf  
• This silt curtain will be removed prior to the removal of the remaining inshore piles and the remaining inshore piles will be removed about high tide. | Project manager | Construction |
| 8   | Water based             | • Visual observations of the effectiveness of the silt curtain are required to be made at least twice each day  
• Results of observations of the integrity of the silt curtain are required to be recorded in a site notebook maintained specifically for the purpose. The notebook is required to be kept on the site and to be available for inspection by persons authorised by Roads and Maritime. | Project manager | Construction |
<p>| 9   | Water based             | • Works will be carried out to minimise the disturbance of sea bottom sediment such as working at high tide.                                               | Project manager | Construction |</p>
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</table>
| 10  | Water based land surface | • An acid sulfate soil management plan will be prepared and implemented in the event that acid sulfate soil is exposed to the atmosphere as a result of removing the piles and preparatory work for the pathway upgrade. This will include:  
  • Checking landside soils and piles for potential acid sulfate soils on removal of piles from water  
  • Carrying out pH and peroxide tests, as relevant, to detect the presence of any potential acid sulfate soils on soils in areas of excavation on the land  
<p>| 11  | Land surface            | • Following removal of the temporary compound the area will be restored with all land surfaces rehabilitated. | Project manager    | Construction                |
| 12  | Land surface            | • All of the ‘land surface’ environmental control measures listed are to be implemented during establishment of the temporary compound and will be set out in the CEMP. | Project manager    | Pre-construction            |
| 13  | Land surface            | • Trees located within the vicinity of the temporary compound will be protected by tree protection fencing for the duration of construction. | Project manager    | Pre-construction and construction |</p>
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</table>
| 14  | Land surface             | • The following matters will be developed in consultation with council prior to work commencing:  
  • Extent of landside site area, barriers, road safety and pedestrian safety  
  • Reconstruction of council assets  
  • The use of council land to host any connection to services where relevant.                                                                 | Project manager  | Pre-construction      |
<p>| 15  | Land surface             | • All wharf structures are to be independent of the existing sea wall. Any changes to the proposed works which could result in additional environmental impacts to the sea wall would be the subject of additional environmental assessment. | Project manager  | Pre-construction and construction |
| 16  | Water based land surface | • Silt and sediment controls will be established prior to any disturbance of the land surface. Controls will be in accordance with edition 4 of <em>Managing Urban Stormwater, Soils and Construction</em> (NSW Government, 2004) (the blue book). | Project manager  | Pre-construction      |
| 17  | Hydrology                | • Weather forecasts will be checked regularly during construction and where flooding is forecast, all equipment and materials will be removed from the compound site and wharf construction area or appropriately secured. | Project manager  | Construction          |
| 18  | Water quality            | • Weather forecasts will be checked regularly during construction and where flooding is forecast, all equipment and materials will be removed from the compound site and wharf construction area or appropriately secured. | Project manager  | Construction          |</p>
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<tbody>
<tr>
<td>19</td>
<td>Water quality</td>
<td>• Erosion and sediment measures would be checked prior to forecasted rainfall and following periods of rainfall.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 20  | Water quality | • Emergency spill kits will be kept on-site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site. A spill kit will be kept on each barge and at the temporary compound site  
  • All staff will be made aware of the location of the spill kits and trained in their use  
  • If a spill occurs, the Roads and Maritime contract manager will be notified as soon as practicable and the Roads and Maritime Incident Procedure will be followed. | Project manager | Construction |
<p>| 21  | Water quality | • Equipment barges carrying plant or machinery will be fitted with bunding around equipment which contain chemicals to prevent chemical spills or leakages from entering the water. | Project manager | Construction |
| 22  | Water quality | • Any chemicals or fuels stored at the temporary compound will be within double bunded areas.                                                                                                                      | Project manager | Construction |
| 23  | Water quality | • All equipment, materials and wastes transported between an appropriately approved and licensed facility, and the construction work site will be secured to avoid spills during transportation.           | Project manager | Construction |
| 24  | Water quality | • Vehicles, vessels and plant will be properly maintained and regularly inspected for fluid leaks.                                                                                                                     | Project manager | Construction |</p>
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<tr>
<td>25</td>
<td>Water quality</td>
<td>• No vehicle or vessel will be washed down or refuelled while on-site.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>26</td>
<td>Water quality</td>
<td>• Emergency contacts will be kept in an easily accessible location on the construction work site and on all construction vessels. All construction workers will be advised of these contact details and procedures</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>27</td>
<td>Water quality</td>
<td>• In an event of a spill during operation, the incident emergency plan will be implemented in accordance with Sydney Ports Corporation's response to shipping incidents and emergencies outlined in the 'NSW State Waters Marine Oil and Chemical Spill Contingency Plan' (Maritime, 2008).</td>
<td>Project manager</td>
<td>Operation</td>
</tr>
</tbody>
</table>
| 28  | Noise and vibration          | • Notification of all potentially affected residents and businesses will be undertaken within 14 days of the proposed night time works in accordance with Section 7.10 of the noise and vibration impact assessment for the proposal and Figure 6-2 of this REF  
• These notifications will include the timing and nature of works as well as the expected noise levels, duration and impacts prior to the commencement of construction  
• Contact details to lodge noise complaints or receive updates would also be provided at this time. | Project Manager      | Pre-construction |
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</table>
| 29  | Noise and vibration           | • A noise and vibration management plan will be prepared and incorporated into the CEMP. The management plan will include but not be limited to:  
  • Reasonable and feasible noise control measures to reduce noise levels taking into account the control methods specified in Section 6.8 and Chapter 7 of the noise and vibration impact assessment for the proposal  
  • Identification of nearby sensitive noise receivers  
  • Details of the assessed hours of work and work to be undertaken  
  • Behavioural practices or other management measures to be implemented to minimise noise  
  • A complaints handling process. | Project Manager | Pre-construction |
<p>| 30  | Noise and vibration           | • Work will be carried out during the recommended standard construction hours identified in the <em>Interim Construction Noise Guideline</em> (DECC, 2009a) as much as practicable. | Project Manager | Construction   |
| 31  | Noise and vibration           | • Temporary hoarding will be erected around the compound site.                                            | Project Manager | Construction   |
| 32  | Noise and vibration           | • Construction personnel will be informed of the location of sensitive receivers, and the need to minimise noise and vibration from the works, through the site induction and regular toolbox talks. | Project Manager | Construction   |
| 33  | Noise and vibration           | • The use of portable radios, public address systems or other methods of site communication that may unnecessarily impact on residents will be avoided. | Project Manager | Construction   |</p>
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<tr>
<td>34</td>
<td>Noise and vibration</td>
<td>• Construction plant and vehicles regularly used on site will be fitted with reverse alarms that are tonal.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>35</td>
<td>Noise and vibration</td>
<td>• Plant and equipment will be regularly inspected to ensure they are in good working order and not emitting excessive noise levels.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>36</td>
<td>Noise and vibration</td>
<td>• Quieter plant and equipment will be selected based on the optimal power and size to most efficiently perform the required task.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>37</td>
<td>Noise and vibration</td>
<td>• Rubber matting will be installed over material handling areas (such as in the bed of trucks) to minimise noise from materials being dropped.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>38</td>
<td>Noise and vibration</td>
<td>• Concrete pumps will be screened, using a solid material such as a hoarding or the like, from surrounding receivers where practicable.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>39</td>
<td>Noise and vibration</td>
<td>• Noise monitoring using a hand held metering device will be undertaken at the site from time to time during the high noise periods including the removal of existing wharf structures and piling.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>40</td>
<td>Noise and vibration</td>
<td>• A condition report for the Sails on Lavender Bay restaurant will be carried out prior to the commencement of the removal of the existing wharf structures and piling activities.</td>
<td>Project Manager</td>
<td>Pre- Construction</td>
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<tr>
<td>41</td>
<td>Noise and vibration</td>
<td>• Vibration monitoring will be carried out at the commencement of piling activities to determine suitable vibration limits based on site conditions. A procedure would then be developed outlining the vibration monitoring required and the process for responding to any exceedance of vibration criteria. Vibration monitoring could include either continuous vibration monitoring during piling works and removal of the existing wharf structures or attended monitoring.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>42</td>
<td>Noise and vibration</td>
<td>• Roads and Maritime will consult with Sails on Lavender Bay restaurant at least two weeks prior to commencement of construction to determine reasonable noise management measures during lunch service.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>43</td>
<td>Flora and fauna</td>
<td>• A spill management plan will be developed and communicated to all staff working on site.</td>
<td>Project Manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>44</td>
<td>Flora and fauna</td>
<td>• If any threatened aquatic species are noted at the construction site unexpectedly, all in water construction works should be halted until the species has left                                                                acja</td>
<td>Project Manager</td>
<td>Construction</td>
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<td>• Prior to commencement of pile driving operations, the contractor is to call Sydney Port Control to check whether there have been any sightings of marine mammals and if so their current location</td>
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<td>• If marine mammals are reported west of Sydney Harbour Bridge (or immediately to east of Sydney Harbour Bridge and travelling west), pile driving operations are to cease or not be undertaken until the marine mammals are reported to be east and well clear of the Sydney Harbour Bridge and travelling east.</td>
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</tbody>
</table>
| 45  | Flora and fauna  | • The construction work site area used will be the minimum size necessary to safely undertake the proposal  
• Exclusion zones will be established to identify the work area and prevent damage to marine habitats outside the work area  
• Should the construction work area identified at Figure 3-1 be expanded further environmental assessment would be required.                                                                                                                                                     | Project Manager | Construction Pre-construction Pre-construction |
| 46  | Flora and fauna  | • All staff working on the site will be advised of the location of rock rubble habitats  
• No vessel anchors will be placed on identified rocky reef or marine vegetation habitats  
• Anchor cables must be suitably buoyed prior to laying, and kept buoyed once laid, to prevent cable drag and cable swing damage (scalping) to marine vegetation and rock rubble habitat areas. Where this is impractical, contractors will use floating rope. | Project Manager | Construction |
<p>| 47  | Flora and fauna  | • All construction related equipment that comes in contact with the seabed (including mooring tackle, cables, ropes and anchors), must be inspected for attached fragments of the declared pest algae species <em>Caulerpa taxifolia</em> and any fragments found must be collected and disposed of into plastic bags then placed into garbage bins on shore in the NSW Control Plan for the Noxious Marine Algae <em>Caulerpa Taxifolia</em> (Department of Industry and Investment, 2009). | Project Manager | Construction |</p>
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<tbody>
<tr>
<td>48</td>
<td>Flora and fauna</td>
<td>• In order to minimise swimming distances for reef fish from piles being pulled to remaining piles in-shore, the piles to be removed will be systematically removing from seawards towards the shore</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 49  | Flora and fauna               | • A specialist marine/aquatic ecologist would undertake a pre-construction inspection of the piles for *Syngnathiformes*  
• In the case that any *Syngnathiformes* are observed on the piles, the specialist marine/aquatic ecologist would re-locate these to an adjacent suitable rocky reef habitat away from the construction work site  
• The marine/aquatic ecologist must hold the appropriate permit under section 37 of the FM Act to undertake the handling and relocation of *Syngnathiformes*. This would be obtained prior to the commencement of pile removal  
• All personnel working within the waters of the construction site would be informed of the potential to encounter *Syngnathiformes*.                                                                                                                                                                                                 | Project Manager | Pre-construction  
                                           |                                           | Construction  
                                           |                                           | Pre-construction  
                                           |                                           | Construction |
| 50  | Land transport and parking    | • A traffic control plan will be prepared in accordance with the ‘*Traffic control at work sites manual*’ (RTA, 2010a) and Australian Standard 1742.3 (Manual of uniform traffic control devices) and will include such things as appropriate wayfinding signage to be installed advising of alternative transport options where necessary.                                                                                                                                                      | Project manager | Pre-construction |
| 51  | Land transport and parking    | • The following matters will be developed in consultation with council prior to work commencing:  
• Traffic management plan  
• Worker parking.                                                                                                                                                                                                                                                                                                                                | Project manager | Pre-construction |
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>52</td>
<td>Water transport</td>
<td>• Commercial, recreational operators and private services that use the existing wharf will be advised of the wharf closure at least two weeks prior to closure.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>53</td>
<td>Water transport</td>
<td>• The water-based construction zone will be clearly delineated and marked to prevent non-construction vessels from entering the construction site.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
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<td>Environmental safeguards</td>
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</tbody>
</table>
| 54  | Water transport | • A Marine Traffic Management Plan (MTMP) will be prepared and implemented during water based construction and wharf removal works, in consultation with NSW Maritime and approved by the Harbour Master.  
• The proposed works will not interfere with the movement of seagoing ships unless agreed in advance with the Harbour Master  
• Buoys will not to be laid in or adjacent to the shipping channels unless agreed in advance with Harbour Master  
• All buoys will be fitted with lights  
• All vessels associated with the works are to have Response Plans for emergencies and spills  
• At least one vessel associated with the works is to be fitted with AIS  
• The applicant is to consult with the Harbour Master and Roads and Maritime with regard to the navigation lights to be fitted to the structure  
• Any marine spill (whether the spill occurs on water or occurs on land and subsequently enters the water) is to be immediately reported to Sydney Ports VTS on VHF Channel 13  
• Any material associated with the construction of the development that enters the water is to be immediately retrieved. Should the material not be retrieved, the Port Authority will organise for its removal and recover the cost from the Applicant  
• The Applicant is to prepare a Communications Plan, for implementation during the works, which must include / address 24/7 contact details, protocols for enquiries, complaints and emergencies. | Project manager | Pre-construction and construction |
<table>
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<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
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<tbody>
<tr>
<td>55</td>
<td>Water transport</td>
<td>• Solar powered navigation lights (Fl.y) are to be fitted to the two seaward piles in order to provide warning of the wharf’s presence in the event of a power failure.</td>
<td>Project manager</td>
<td>Operation</td>
</tr>
<tr>
<td>56</td>
<td>Landscape, visual and urban design</td>
<td>• During detailed design, the siting and layout of the wharf is to be prepared in accordance with Roads and Maritime Beyond the Pavement (Roads and Maritime Services 2014) and consider the UNESCO Sydney Opera House Buffer Zone.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>57</td>
<td>Landscape, visual and urban design</td>
<td>• The final design is to ensure new structures are integrated with existing landside elements.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>58</td>
<td>Landscape, visual and urban design</td>
<td>• The detailed design is to maintain and provide pedestrian connections and integrate other modes of transport.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>59</td>
<td>Landscape, visual and urban design</td>
<td>• The detailed design is to incorporate the ‘suite’ of structures, fixtures and furniture developed for wharf upgrade program, ensuring wharf identity and ease of maintenance.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>60</td>
<td>Landscape, visual and urban design</td>
<td>• The compound site and works area would be kept clean and clear of rubbish.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
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</tr>
<tr>
<td>61</td>
<td>Landscape, visual and urban design</td>
<td>• Urban design principles will be integrated throughout the detailed design and construction of the proposal.</td>
<td>Project Manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>62</td>
<td>Landscape, visual and urban design</td>
<td>• The design of the wharf lights will be to Australian Standards.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The wharf lighting will be designed to minimise impacts on existing residences through incorporating dimmers and time clocks so that lights are dimmed at the time of the last ferry and by facing lights towards the ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The wharf lights will be simple in design with minimal fixtures, and resistant to vandalism where possible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Non-Aboriginal heritage</td>
<td>• The demolition of the existing wharf may result in the removal of the wharf from Roads and Maritime’s s170 heritage register. In accordance with section 170A of the <em>Heritage Act 1977</em>, the Heritage Council will be given written notice of the proposal no less than 14 days prior to demolition of the wharf.</td>
<td>Project Manager</td>
<td>Pre-demolition</td>
</tr>
<tr>
<td>64</td>
<td>Non-Aboriginal heritage</td>
<td>• All relevant staff, contractors and subcontractors will be made aware of their statutory obligations for heritage under the <em>Heritage Act 1977</em>, through the site induction and toolbox talks.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>65</td>
<td>Non-Aboriginal heritage</td>
<td>• All construction staff will be inducted in the Roads and Maritime Services <em>Standard Management Procedure - Unexpected Heritage Items Procedure</em> (2015) and will implement this procedure where necessary.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
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</tr>
</tbody>
</table>
| 66  | Non-Aboriginal heritage | • If, during the course of development works, further suspected non-Aboriginal cultural heritage material, including historic shipwrecks, are discovered, work will cease in that area immediately  
• The Heritage Branch, Office of Environment and Heritage (02 9873 8500) will be notified and works only recommence when relevant permits and an appropriate management strategy instigated. | Project Manager | Construction |
| 67  | Non-Aboriginal heritage | • Heritage information will be placed on site during the construction phase to interpret the historic development and use of McMahons Point Wharf. Information will be in the form of heritage images and text on construction phase hoarding, or laminated posters put up beside general proposal information on site  
• Post construction, Roads and Maritime will provide heritage interpretation plan/strategy on an ongoing/permanent basis so that the site’s significance is communicated. | Project Manager  
Roads and Maritime Services | Construction  
Post-construction |
| 68  | Non-Aboriginal heritage | • A detailed archival record will be made of wharf prior to the commencement of demolition works in accordance with the publication *How to Prepare Archival Records of Heritage Places* (Heritage Office 1998).  
• Copies of the record will be submitted to North Sydney Council, the NSW Heritage Division library, as well as being offered to the NSW State Library. | Project Manager | Pre-construction |
<p>| 69  | Aboriginal impact | • If the scope of the proposal changes, the Roads and Maritime’s Aboriginal cultural heritage advisor, Sydney, and the Roads and Maritime Services environmental staff must be contacted to reassess any potential impacts on Aboriginal cultural heritage. | Project Manager | Pre-construction |</p>
<table>
<thead>
<tr>
<th>No.</th>
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<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>70</td>
<td>Hazards</td>
<td>• A life preserving ring and appropriate first aid provisions will be located within the compound and on all barges during the construction period.</td>
<td>Project Manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 71  | Air emissions during construction | • Measures to address air quality impacts will be incorporated into the CEMP and implemented throughout the construction period. As a minimum, the following measures will be included:  
  • Covering of all loaded trucks and vessels.  
  • Machinery to be turned off rather than left to idle while not in use.  
  • Maintenance of all vehicles, including trucks and vessels entering and leaving the site in accordance with the manufacturers’ specifications to comply with all relevant regulations.  
  • Maintenance of all plant and equipment to ensure good operating condition and exhaust emissions comply with the Protection of the Environment Operations Act 1997.  
  • Maintaining the work site in a condition that minimises fugitive emissions such as minor dust. | Project Manager | Pre-construction and construction |
<p>| 72  | Social and economic            | • North Sydney Council and the local community are to be kept informed about the details of the works, construction progress, wharf closure, changes to public transport arrangements, and other impacts during the construction period. | Project manager | Pre-construction and construction |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>Social and economic</td>
<td>• An internet site and free call phone number for proposal enquiries will be established for the duration of the works. Contact details will be clearly displayed at the site throughout the construction period. Directions will be provided on how to make an enquiry or register a complaint regarding the works.</td>
<td>Project manager</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>73</td>
<td>Social and economic</td>
<td>• An enquiry and complaint tracking system will be established. Any enquiries or complaints will be acknowledged within 24 hours of being received</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>74</td>
<td>Social and economic</td>
<td>• All operational wharf lighting and signage is to comply with the Disability Standards for Accessible Public Transport (2002).</td>
<td>Project manager</td>
<td>and construction</td>
</tr>
<tr>
<td>75</td>
<td>Social and economic</td>
<td>• The new wharf will be constructed to be compliant with current legislative standards for the provision of access for a person with a disability.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
<tr>
<td>76</td>
<td>Social and economic</td>
<td>• The construction site will be lit at night for safety. Lights will be downward facing so that light is not directed toward nearby residences.</td>
<td>Project manager</td>
<td>Construction</td>
</tr>
</tbody>
</table>
7.3 Licensing and approvals

A permit under section 37 of the FM Act is required for the relocation of any Syngnathiformes (e.g. Seahorses).

An appropriate permit under section 37 of the FM Act must be held by the marine/aquatic ecologist to undertake the handling and relocation of Syngnathiformes. Such a permit is already held for the Commuter Wharf Upgrade program. The applicability and status of this permit would be checked for its validity prior to the commencement of pile removal to enable the relocation of Syngnathiformes if required.

A license/permit would be required from North Sydney Council for the location of the temporary compound.
8 Justification and Conclusion

This Chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

8.1 Justification

The proposal is justified because it would improve access for people with a disability to the wharf interchange and commuter experience and safety. The proposal is also justified as it would meet the proposal objectives. The proposal does this in a manner that would have minimum impact on the environment and the community. The following sections consider the justification of the proposal in relation to social and economic factors, biophysical factors and the public interest.

8.1.1 Social factors

Social factors contributing to the justification of the proposal include:

- Improved safety from the location of berthing faces within deeper water and therefore reducing risk of vessels hitting the seafloor
- Improved commuter experience by providing a practical, functional and robust ferry commuter wharf with appropriate waiting and standing areas, passenger seating and shelter while allowing for the enjoyment of good weather, harbour views and aquatic activity
- Enhanced water transport in Sydney Harbour by improving access to commuter ferry services
- Reduced opportunity for vandalism with the use of appropriate materials, surfaces and designs
- Reduction in the unauthorised and inappropriate use of terminals and facilities through the installation of closed circuit televisions
- Improve access from the adjoining residential area to a range of cultural sites around the harbour
- The interrelationship of waterway and foreshore uses would be improved through more effective access to water-based public transport
- Potential increase in commuters using the wharf and ferry services due to the upgraded facilities and access.

8.1.2 Biophysical factors

Biophysical factors contributing to the justification of the proposal include the upgrade of the wharf so that it is resilient to the projected impacts of sea level rise.

8.1.3 Economic factors

The proposal involves the upgrade of the existing McMahons Point Wharf to provide improved boarding efficiency, commuter comfort and safety. This would assist in increasing the potential patronage of the ferry service by making it available to more of the community and by improving the service.

The proposal would enhance the role of the harbour as both a working harbour and an effective transport corridor by improving access to water-based public transport facilities.

The proposal would reduce wharf maintenance costs through scales of economy achieved through standardising wharf design, construction materials and fittings throughout Sydney Harbour.
8.1.4 Public interest

The proposal would be in the public interest as it would contribute to improving the overall ferry service as well as the connection of McMahons Point with Sydney’s CBD and other suburbs.

8.2 Objects of the EP&A Act, including the principles of ecologically sustainable development

Table 8-1 Objects of the EP&A Act

<table>
<thead>
<tr>
<th>Object</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.</td>
<td>The proposal would contribute to improved management, development and conservation of the McMahons Point Wharf. The proposal would promote the social and economic welfare of the community by improving the commuter experience for patrons using the McMahons Point Wharf. Refer to Chapter 6 for further details.</td>
</tr>
<tr>
<td>5(a)(ii) To encourage the promotion and co-ordination of the orderly economic use and development of land.</td>
<td>The proposal has been coordinated as part of the strategic Ferry Wharf Upgrade Program (see section 2.1).</td>
</tr>
<tr>
<td>5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services.</td>
<td>The proposal would not impact on the provision or coordination of communication and/or utility services. Relevant utility providers have been consulted during the development of the proposal.</td>
</tr>
<tr>
<td>5(a)(iv) To encourage the provision of land for public purposes.</td>
<td>The proposal would upgrade the existing wharf and it would continue to be used for both Sydney Ferry services and other vessels such as taxis and recreational vessels.</td>
</tr>
<tr>
<td>5(a)(v) To encourage the provision and co-ordination of community services and facilities.</td>
<td>The new wharf would result in a wharf that complies with the DDA standards for 80 per cent of all tides.</td>
</tr>
<tr>
<td>Object</td>
<td>Comment</td>
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</tr>
<tr>
<td>5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.</td>
<td>An aquatic ecology assessment has been undertaken which indicates that there would be no long term harm to marine ecology as a result of the proposal. Impacts on benthic organisms would be temporary and minimised by appropriate safeguards and management measures. There would be an increase in hard-substratum habitat with piles located within deeper water. Refer to section 6.5 for further information.</td>
</tr>
<tr>
<td>5(a)(vii) To encourage ecologically sustainable development.</td>
<td>Ecologically sustainable development is considered in Sections 8.2.1 – 8.2.4 below.</td>
</tr>
<tr>
<td>5(a)(viii) To encourage the provision and maintenance of affordable housing.</td>
<td>Not relevant to the project.</td>
</tr>
<tr>
<td>5(b) To promote the sharing of the responsibility for environmental planning between different levels of government in the State.</td>
<td>Consultation has been undertaken with North Sydney Council, TfNSW and the foreshore authority as detailed in Chapter 5.</td>
</tr>
<tr>
<td>5(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.</td>
<td>Consultation has been undertaken with North Sydney Council, TfNSW and the FW PDAC as detailed in Chapter 5.</td>
</tr>
</tbody>
</table>

### 8.2.1 The precautionary principle

The precautionary principle upholds 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.

When applying the precautionary principle public and private decisions should be guided by:

- Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment.
- An assessment of risk-weighted consequences of various options.

A precondition for the operation of the precautionary principle is that there are threats of serious or irreversible environmental damage. This REF has demonstrated that such threats are not present for the proposal.

Regardless, the proposal has sought to take a precautionary approach to minimise environmental impacts. This has also been applied in the development of safeguards and management measures. Best available technical information, environmental standards and measures have been used to minimise identified environmental risks of the proposal.

Conservative ‘worst case’ scenarios were considered while assessing the environmental impact of the proposal. For example conservative estimates of the number of construction barges, vessels and vehicles were used for the impact assessment. Worst case construction times were also assessed.
Specialist advice in noise and vibration, heritage, aquatic ecology, landscape character and visual impact were incorporated for a detailed understanding of the existing environment.

Planning for the proposal involved a risk assessment process that evaluated the environmental risks of the Ferry Wharf Upgrade Program. Measures to avoid the identified risks were then factored into the construction planning for the proposal. These included:

- The decision to use an off-site facility, to undertake as much of the construction work as possible was made to minimise impacts to the surrounding residential area.
- The decision to transport most personnel, materials, plant and equipment between the off-site facility, and the construction work site by barge/boat was made to reduce environmental impacts such as traffic, parking and noise impacts.

8.2.2 Intergenerational equity

The principle of intergenerational equity upholds 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.

The proposal would benefit both existing and future generations in the following ways:

- Improved customer experience as a result of the McMahons Point Wharf interchange.
- Maintaining the local environment and implementing safeguards and management measures to protect the environmental values of McMahons Point and Sydney Harbour.
- Providing a facility with a service life of 50 years.

The proposal has integrated short and long-term social, financial and environmental considerations so that any foreseeable impacts are not left to be addressed by future generations. Issues with potential long term implications such as the consumption of non-renewable resources, waste disposal and water quality have been avoided and/or minimised through construction planning and the application of safeguards and management measures described at section 7.2.

8.2.3 Conservation of biological diversity and ecological integrity

The principle of biological diversity upholds that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

The construction planning outcomes and safeguard and management measures described at section 7.2 would minimise the impacts of the proposal on aquatic and terrestrial biodiversity and the ecological integrity of McMahons Point and Sydney Harbour and its surrounding landscapes.

8.2.4 Improved valuation, pricing and incentive mechanisms

This principle upholds that environmental factors should be included in the valuation of assets and services, such as:

- Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
- 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.
- 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.
Environmental issues have been considered in the strategic planning for the proposal. The preservation and/or improvement of social, economic, heritage and transport values of McMahons Point Wharf are the primary reasons that justify the need for the proposal. The environmental goals of the proposal have been pursued in the most cost effective way through the construction planning process.

Mitigation measures for avoiding, reusing, recycling and managing waste during construction and operation would be implemented.

### 8.3 Conclusion

The proposed McMahons Point Wharf interchange upgrade is subject to assessment under Part 5 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the proposal objectives but would still result in some impacts including construction noise, water quality, public transport and parking during construction, aquatic habitats, landscape character and views.

Safeguards and management measures detailed in this REF would ameliorate or minimise these potential impacts. The proposal would also provide improved efficiency for passenger boarding, a better commuter experience for those using the upgraded facility, safer boarding conditions, and improved water safety as well contributing to unifying and standardising wharves in Sydney Harbour. On balance the proposal is considered justified.

The proposal is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the TSC Act or FM Act and therefore a Species Impact Statement is not required.

The proposal is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought for the proposal from the Minister for Planning under Part 5.1 of the EP&A Act.
This review of environmental factors provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

Greg Tallentire
Senior Consultant
RPS Australia East Pty Ltd
11 January 2016

I have examined this review of environmental factors and accept it on behalf of Roads and Maritime Services.

Bob Rimac
Senior Project Manager
Roads and Maritime Services region/area
15 January 2016
References

Australian Standard series 1428.
Australian Standards 4997-2005
British Standard 6472: 1992 Guide to evaluation of human exposure to vibration in buildings (1Hz to 80Hz)
Building Code of Australia (2011)
Department of Environment and Climate Change (2008) NSW Government Sustainability Policy, Sydney South
Department of Environment Climate Change and Water (DECCW) (2009b) Interim Construction Noise Guideline
Department of Environment Climate Change and Water (DECCW) (2010a) Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.
Department of Environment Climate Change and Water (DECCW) (2010b) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.
Department of Premier and Cabinet NSW (2011) NSW 2021 – A plan to make NSW number one.
Department of Urban Affairs and Planning (DUAP) (1999) Is an EIS required?
Disability Standards for Accessible Public Transport (2002).
Environmental Protection Agency (EPA 1999) NSW Environmental Criteria for Road Traffic Noise Guidelines
Infrastructure NSW (2012), State Infrastructure Strategy 2012-2032.


Roads and Traffic Authority of NSW (RTA) (2010) Traffic control at work sites manual, RTA.

# Terms and acronyms used in this REF

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AHD</td>
<td>Australian Height Datum</td>
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<td>AS</td>
<td>Australian Standard</td>
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<tr>
<td>BCA</td>
<td>Building Code of Australia</td>
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<tr>
<td>Berthing</td>
<td>A space for a vessel to dock.</td>
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<td>CCTV</td>
<td>Closed circuit television</td>
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<tr>
<td>CEMP</td>
<td>Construction environmental management plan</td>
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<tr>
<td>DDA</td>
<td>Disability Discrimination Act 1992</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
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<tr>
<td>EP&amp;A Act</td>
<td>Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW</td>
</tr>
<tr>
<td>ESD</td>
<td>Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased</td>
</tr>
<tr>
<td>Fetch</td>
<td>An area where ocean waves are being generated by the wind.</td>
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<tr>
<td>FM Act</td>
<td>Fisheries Management Act 1994 (NSW)</td>
</tr>
<tr>
<td>Gangway</td>
<td>A landing used by passengers to board or exit ships/vessels</td>
</tr>
<tr>
<td>Heritage Act</td>
<td>Heritage Act 1977 (NSW)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>ISEPP</td>
<td>State Environmental Planning Policy (Infrastructure) 2007</td>
</tr>
<tr>
<td>Jetty</td>
<td>A structure extending into the harbour as part of a wharf.</td>
</tr>
<tr>
<td>LAT</td>
<td>Lowest astronomical tide</td>
</tr>
<tr>
<td>LEP 2010</td>
<td>North Sydney Local Environmental Plan 2013</td>
</tr>
<tr>
<td>LGA</td>
<td>Local government area.</td>
</tr>
<tr>
<td>MHW M</td>
<td>Mean high water mark</td>
</tr>
<tr>
<td>NPW Act</td>
<td>National Parks and Wildlife Act 1974 (NSW)</td>
</tr>
<tr>
<td>Piles</td>
<td>Foundations used to support marine structures and offshore platforms</td>
</tr>
<tr>
<td>Pontoon</td>
<td>A floating structure serving as a dock</td>
</tr>
<tr>
<td>SREP</td>
<td>Sydney Regional Environmental Plan</td>
</tr>
<tr>
<td>TSC Act</td>
<td>Threatened Species Conservation Act 1995 (NSW)</td>
</tr>
<tr>
<td>TSC Act</td>
<td>Threatened Species Conservation Act 1995 (NSW)</td>
</tr>
<tr>
<td>Wharf</td>
<td>A landing place or pier where ships may tie up and load or unload</td>
</tr>
<tr>
<td>ZFDTG</td>
<td>Zero of Fort Denison Tide Gauge</td>
</tr>
</tbody>
</table>