



South Mosman Wharf Upgrade

Submissions report

Transport for NSW | June 2021

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Prepared by Cardno (NSW/ACT) Pty Ltd and Transport for NSW



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Executive summary

The proposal

Transport for NSW is proposing to upgrade South Mosman wharf (the proposal) as part of the Transport Access Program (TAP). The proposal includes both landside and waterside works including installation of a new wharf, lift and stairs and removal of the existing wharf structure.

The upgraded wharf would provide access for customers with mobility needs, meeting the standards of the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

Details of the proposal are provided in section 1.1 of this Submissions report.

Display of the Review of Environmental Factors

Transport for NSW prepared a review of environmental factors (REF) for the South Mosman wharf upgrade (TfNSW, 2020). The REF was publicly displayed between 30 November 2020 and 15 January 2021. The REF was published on the Transport for NSW project website and made available for download.

Due to COVID-19 the REF was available online and printed versions by request. A number of activities were carried out during the public display period to provide the community with an opportunity to learn more about the proposal, ask questions and 'have their say'. Activities included installation of posters at the wharf, distribution of community updates and postcards, a targeted social media campaign and meetings with individual community members on request.

Summary of issues and responses

A total of 34 submissions were received: 32 from the general community including one community group, and one each from Mosman Council and the Department of Primary Industries (DPI) Fisheries.

The main issues raised and responses to those issues are summarised below.

Proposal design

Eight submissions provided feedback and suggestions on the design of the proposal, including five submissions questioning whether adequate weather protection is provided in the design.

Response

The proposal includes shelter for customers with overhead cover provided on the pontoon, gangway, stairs and the upper and lower platforms of the lift. Cover to the gangway, stairs and lift platforms was incorporated into the design following community feedback received during the public exhibition of the concept design. Additional weather protection will be investigated during detailed design.

Glass screens would also be provided at the northern and southern ends of the covered pontoon, providing weather protection for the centrally located seating area.

As owners of the footpath, Mosman Council is responsible for considering weather protection options between the entrance to the lift and stairs and the existing bus stop on Musgrave Street. Following detailed design, this request will be passed on to Mosman Council for consideration if required.

Proposal justification

Four respondents questioned the justification for the proposal.

Response

The existing wharf has been identified for an accessibility upgrade as it does not currently meet key requirements of the DDA or the DSAPT. The purpose of the proposed upgrade is to ensure that the wharf complies with the DDA requirements to make transport infrastructure accessible by 2022.

Noise and vibration

Four submissions raised concerns and comments regarding potential construction noise and vibration impacts, timing and working hours.

Response

Transport for NSW acknowledges there would be noise and vibration impacts during construction. The noise levels predicted in the REF were for the worst case scenario with all noise sources operating simultaneously within the construction footprint. In practice, noise experienced by nearby receivers is likely to be substantially lower than the noise model predictions.

Construction work would be undertaken primarily during daytime hours, and a Construction Noise and Vibration Management Plan (CNVMP) would be prepared to manage potential impacts. The CNVMP would outline mitigation measures in line with the Transport for NSW *Construction Noise and Vibration Guidelines* (RMS, 2016). Community members would be notified of upcoming work including high noise-generating works. Controls to manage vibration would be implemented for those structures identified within the safe working distance zone. Additionally, dilapidation surveys would be undertaken prior to and after the completion of construction activities. Once in construction, Transport for NSW would work with the community to monitor and manage noise and vibration impacts.

Landscape character and visual impact

Five respondents raised concerns about the landscape character and visual impacts of the proposed design, noting the proposed development should be more sympathetic to the local environment. Respondents Submissions also raised concerns about the height of the lift.

Response

Transport for NSW acknowledges the visual amenity concerns raised regarding the proposed design. The design of the wharf would be consistent with other wharfs within Sydney Harbour.

The proposed configuration of the new wharf was based on a number of design requirements including the need to minimise movement of the pontoon (thereby maximizing customer comfort and safety), avoiding existing moorings and allowing the wharf to be accessible in all tidal states.

Whilst the current proposal would introduce a new visual element to the existing landscape and would involve loss of some foreshore vegetation and trees, the potential impacts would be further minimised during detailed design through material selection, replanting, landscape treatment and design refinement.

The current design includes a steel framed lift. The overall height of the lift (as seen from water) would be around 15-16 metres, with around 7.5 metres of this structure visible from street level. During detailed design, Transport for NSW will investigate the option of reducing the lift height.

The area of proposed vegetation and tree removal in the REF is the worst case scenario. During detailed design Transport for NSW will aim to minimise vegetation removal and retain as many existing trees as possible. At completion the area would be replanted and landscaped with native vegetation local to the Sydney region in consultation with Mosman Council to reinstate the green space and minimise visual impacts. During detailed design Transport for NSW will also investigate the option of adding a green/living wall on the lift.

Alternative public transport during construction

Three respondents raised concerns relating to alternative public transport during construction.

Response

The existing wharf would be closed and all ferry services suspended for up to six months (depending on weather) to allow for the safe construction of the new wharf. During this time commuters would need to use alternate transport. Alternative public transport options that would be available during the wharf closure include using ferry services at Mosman Bay wharf, local bus services including bus route 111 and train services at North Sydney and Milsons Point stations.

Discussions will be held with the State Transit Authority to determine if bus services need to be increased and operating hours extended to cater for the potential increase in demand during the construction period.

Construction traffic management

Three respondents raised concerns about traffic management during construction, including access to private properties and parking.

Response

A Traffic Management Plan (TMP) would be prepared and implemented during construction. The TMP would include details on property and construction site access, parking arrangements and alternate pedestrian and cyclist access and transport. Transport for NSW would consult with affected residents prior to commencement of construction works and look to minimize impacts where possible.

Access to the surrounding properties would be maintained at all times throughout the construction phase (including for emergency vehicles) and notification of changes to access would be provided in advance.

Wharf closure

Three respondents raised concerns about the closure length of the existing wharf during construction, with one respondent suggesting a temporary wharf be installed for use during construction of the new wharf

Response

Closure of the existing wharf and stopping ferry services would be limited to the time required to safely remove the existing wharf and construct the new wharf. Construction is expected to take up to six months to complete, depending on weather, however the construction contractor would investigate options to reduce this timeframe when preparing the construction work schedule.

Transport for NSW considered the possibility of constructing a temporary wharf for customers during the wharf closure period, however it was deemed unfeasible due to cost, low wharf patronage and the availability of nearby alternate transport options in the area.

Privacy

Three respondents raised concerns that the current proposal would impact on privacy as the design would allow ferry patrons visibility into their residential properties. Privacy concerns relate to the position of the proposed pontoon, lift and stair structures, and removal of the established trees on the foreshore.

Response

Transport for NSW will investigate opportunities to refine the design to address the privacy issues raised while maintaining accessibility requirements, including:

- Re-positioning the wharf structure further to the south and east and away from residential properties

- Re-positioning the stairwell and lift
- Considering the use of different materials on the pontoon, lift and stair structures (e.g. frosted glass)
- Incorporating a green/living wall on the side of the lift.

During detailed design the Transport for NSW will aim to minimise vegetation removal and retain as many trees as possible, including along the boundary of the compound site and adjacent residential properties. At completion the area would be replanted and landscaped with native vegetation local to the Sydney region in consultation with Mosman Council to reinstate the green space and minimise visual/privacy impacts.

Recreational fishing

Three respondents raised concerns about recreational fishing at the existing wharf.

Response

Recreational fishing in Sydney Harbour is regulated by the DPI Fisheries and is currently permissible at the existing South Mosman wharf and would be permissible at the new wharf.

Signage would be installed on the new wharf to inform and remind the fishing community of the requirements of responsible fishing.

Considerations during detailed design

Transport for NSW will consider opportunities to refine the proposal during detailed design while maintaining accessibility requirements, including:

- Re-positioning the wharf structure further to the south and east and away from residential properties
- Re-positioning the stairwell and lift
- Considering the use of different materials on the pontoon, lift and stair structures (e.g. frosted glass)
- Incorporating a green/living wall on the side of the lift
- Reducing the height of the lift
- Providing additional weather protection
- Minimising vegetation removal and retaining as many existing trees as possible.

Additional assessment

Since preparation and exhibition of the REF the White's Seahorse (*Hippocampus whitei*) has been listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An Assessment of Significance (AoS) for the White's Seahorse has been completed in accordance with the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DoE, 2013). The assessment concludes the proposal is unlikely to significantly impact White's Seahorse and a referral to the Commonwealth is not required.

Next steps

Transport for NSW as the determining authority will consider the information in the REF and this Submissions report and make a decision whether or not to proceed with the proposal. The decision will be shared with stakeholders and the community.

Where a decision is made to proceed, Transport for NSW would continue to consult with the community and stakeholders prior to and during the construction phase.

Contents

Executive summary	i
Contents	v
1. Introduction and background	1
1.1 The proposal.....	1
1.2 REF display	3
1.3 Purpose of the report	3
2. Response to issues	4
2.1 Overview of issues raised	5
2.2 Proposal design	6
2.3 Proposal justification	7
2.4 Consultation.....	8
2.5 Biodiversity	8
2.6 Noise and vibration	9
2.7 Landscape character and visual impact	12
2.8 Transport, traffic and access.....	13
2.9 Social.....	16
2.10 Non-Aboriginal heritage	18
2.11 Other.....	19
3. Environmental assessment	21
3.1 Biodiversity	21
4. Environmental management	22
4.1 Environmental management plans (or system)	22
4.2 Summary of safeguards and management measures	22
4.3 Licensing and approvals	42
5. References	43

Tables

Table 2-1: Respondents	4
Table 3-1: Summary of environmental safeguards and management measures.....	23
Table 5-2: Summary of licensing and approval required	42

Appendices

Appendix A	South Mosman Wharf Upgrade, Review of Environmental Factors, November, 2020
Appendix B	Significant impact assessment (EPBC Act)

1. Introduction and background

1.1 The proposal

Transport for NSW proposes to upgrade the South Mosman wharf (the proposal) as part of the Transport Access Program (TAP) which includes both waterside and landside upgrade works.

The waterside features of the proposal would include:

- Installation of a new covered 18.9 metre gangway, located to the north of the existing wharf to provide access to the new pontoon
- Installation of a new covered steel 9 metre by 22.5 metre pontoon containing a curved zinc roof, steel columns, glass weather screens, stainless steel balustrades, seating and information boards. The pontoon would be held in place by four new piles, with one pivot pile (to assist with berthing) provided at either end of the pontoon (two in total)
- Installation of safety and security features on the pontoon including lighting, closed circuit television (CCTV) cameras, ladders to the water and a life buoy on the pontoon, glass weather screen and tactile ground surface indicators
- Removal of the existing gangway and pontoon including existing piles
- Remediation of the seawall following removal of the existing wharf, if required.

The landside features of the proposal would include:

- Installation of a new 16 metre high lift and new covered stairs
- Installation of a new covered street level waiting area
- Installation of a new covered footpath and jetty structure from the proposed lift and stairs to the proposed gangway
- Installation of three bicycle parking hoops
- Removal of existing shelter and stairs from Musgrave Street to the existing wharf
- Removal of trees and vegetation to construct the lift, stairs and ramp to the jetty.

The proposal would be constructed over a duration of up to six months and is expected to start late 2021.

An overview of the proposal is provided in Figure 1-1.

A more detailed description of the proposal is found in the South Mosman wharf upgrade Review of Environmental Factors (REF) prepared by Transport for NSW in November 2020 (TfNSW, 2020).

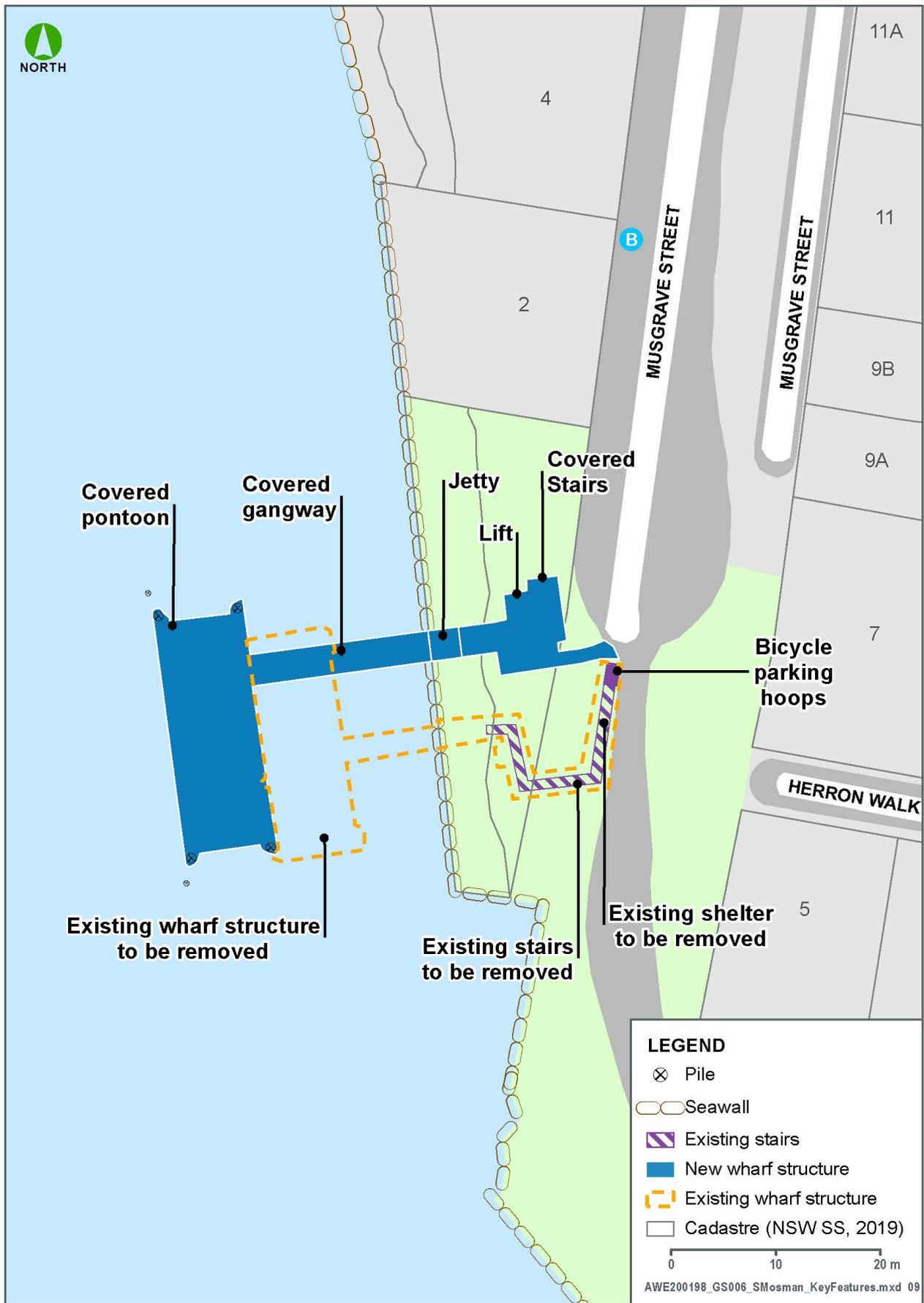


Figure 1-1: Overview of the proposal

1.2 REF display

Transport for NSW prepared a review of environmental factors (REF) to assess the potential environmental impacts of the proposed works. The REF was publicly displayed for 47 days between 30 November 2020 and 15 January 2021. The consultation period was longer than the normal four weeks to account for the holiday period.

The REF was available online in digital format only with printed copies available on request. Due to COVID-19, general public meetings were not held to safeguard the health and safety of the community and Transport for NSW staff.

The REF was placed on the Transport for NSW project website and made available for download. A range of community consultation activities were undertaken for the public display which included:

- Installation of posters at the wharf with quick response (QR) codes taking passengers to an online survey
- Distribution of around 1800 community updates letterbox dropped within the suburbs of Mosman, and Cremorne Point at the start of the public display period
- Distribution of around 1800 postcards as a reminder halfway through the public display period as a reminder for the community to have their say
- A targeted social media campaign during the public display period that reached 16,065 people
- An opportunity for the community to set up a phone or video meeting with the project team
- Emails sent to 184 people on the project database
- Meetings with local residents.

1.3 Purpose of the report

This Submissions report relates to the REF prepared for the South Mosman wharf upgrade and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Transport for NSW. This Submissions report summarises the issues raised and provides responses to each issue (Chapter 2), describes new environmental assessments (Chapter 3) and identifies new or revised environmental management measures for the proposal (Chapter 4).

No proposal changes are proposed that would require the preparation of a preferred infrastructure report.

2. Response to issues

Transport for NSW received 34 submissions, accepted up until the 11 February 2021. Table 2-1 lists the respondents and each respondent's allocated submission number. The table also indicates where the issues from each submission have been addressed in this Submissions report.

Table 2-1: Respondents

Respondent	Submission No.	Section number where issues are addressed
Friends of Sydney Harbour	1	2.7
Individual	2	Supportive of proposal
Individual	3	2.11.1
Individual	4	2.2.1, 2.2.3
Individual	5	2.2.2, 2.4, 2.6.1, 2.6.2, 2.6.3, 2.6.4, 2.8.1, 2.8.2, 2.9.1, 2.9.2, 2.11.2, 2.11.3
Individual	6	2.8.2, 2.11.1
Individual	7	2.2.1, 2.9.3
Individual	8	2.9.3
Individual	9	2.2.2, 2.8.3
Individual	10	2.3, 2.7, 2.10
Individual	11	2.3
Individual	12	2.3
Individual	13	2.4, 2.6.5, 2.8.3, 2.9.1, 2.11.2, 2.11.3
Individual	14	2.2.3, 2.4, 2.6.1, 2.7, 2.9.1, 2.9.2, 2.9.3
Individual	15	2.8.3
Individual	16	Supportive of proposal
Individual	17	Supportive of proposal
Individual	18	2.8.1
Individual	19	Supportive of proposal
Individual	20	2.2.1
Individual	21	Supportive of proposal
Individual	22	2.2.1
Individual	23	2.3
Individual	24	Supportive of proposal
Individual	25	2.8.4

Respondent	Submission No.	Section number where issues are addressed
Individual	26	2.2.1, 2.8.1
Individual	27	2.6.2
Individual	28	Not supportive of proposal
Individual	29	Supportive of proposal
Individual	30	Supportive of proposal
Individual	31	2.7
Individual	32	Not supportive of proposal
Mosman Council	33	2.7, 2.8.2, 2.10
Department of Primary Industries (DPI) Fisheries	34	2.5

2.1 Overview of issues raised

A total of 34 submissions were received in response to the display of the REF. This included submissions from two government agencies, one local community group and 31 individual submissions from the community.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided. The issues raised and Transport for NSW response to these issues forms the basis of this chapter.

The issues raised in the submissions from the community and agencies can be categorised into ten main areas as follows:

- Proposal design
- Proposal justification
- Consultation
- Biodiversity
- Noise and vibration
- Landscape character and visual impacts
- Transport, traffic and access
- Social impacts including privacy
- Non-Aboriginal heritage
- Other impacts.

2.2 Proposal design

2.2.1 Weather Protection

Submission number(s)

4, 7, 20, 22, 26

Issue description

Respondents raised concerns that the proposed wharf design does not provide adequate shelter from the wind and rain. One respondent suggested the covered upper platform of the lift be extended to the footpath, while another respondent suggested a shelter be provided at the bus stop on Musgrave Street.

Response

The proposal includes shelter for customer with overhead cover provided on the pontoon, gangway, stairs and the upper and lower platforms of the lift.

Cover to the gangway, stairs and lift platforms was incorporated into the design following community feedback received during the public exhibition of the concept design. This additional cover would offer improved weather protection for customers. Additional weather protection will be investigated during detailed design.

Glass screens would be provided at the northern and southern ends of the covered pontoon, providing weather protection for the centrally located seating area.

As owners of the footpath, Mosman Council is responsible for considering weather protection options between the entrance to the lift and stairs and the existing bus stop on Musgrave Street. Following detailed design, this request will be passed on to Mosman Council for consideration if required.

2.2.2 Lighting

Submission number(s)

5, 9

Issue description

One respondent raised concerns about increased light spill into neighbouring properties from the proposed design noting the use of clear glass panels. One respondent requested that adequate lighting and security cameras be installed at the stairs and lift to address personal safety and security concerns.

Response

Lighting options would be explored during detailed design and would be designed and installed in accordance with relevant guidelines and standards. The design would aim to limit potential impacts of light spill to surrounding properties.

A range of safety and security facilities would also be installed at the new wharf, including lighting and closed circuit television (CCTV) cameras. The final arrangement would be determined during detailed

design. Consideration of frosted glass or alternative designs to clear panels would be undertaken during detailed design.

2.2.3 Other

Submission number(s)

4, 14

Issue description

One respondent was unresponsive of the wharf design as it is similar to the design at Cremorne Point. One respondent requested for the lift and stairs to move closer to the bus drop off point.

Response

The Ferry Wharf Upgrade Program has been designed to create a recognisable theme and continuity for Sydney Harbour. The design aims to identify the harbour wharves and the ferry commuter transport system, as such the proposed design at South Mosman is similar to the design at Cremorne Point.

The location of the stairs and lift was chosen as it best strikes a balance between minimising impacts to vegetation and nearby residents while providing compliant access.

2.3 Proposal justification

Submission number(s)

10, 11, 12, 23

Issue description

A number of respondents questioned the justification for the proposal given the low patronage, the lack of accessible access from the steep topography in the local area, the proximity to Mosman Bay wharf and the belief that the existing wharf is structurally sound. The respondents questioned whether the benefits of the proposal outweighed the adverse impacts of loss of visual amenity, heritage impacts and the six month closure of the wharf. Two respondents suggested that the 'do nothing option' was not adequately considered.

Response

The South Mosman wharf has been identified for an accessibility upgrade as it does not currently meet key requirements of the DSAPT or the DDA.

DSAPT and *Disability (Access to Premises – Buildings) Standards 2010* made under the DDA, require all public transport infrastructure, including wharves, to be fully compliant by December 2022.

Customers with mobility needs are currently unable to access Musgrave Street from South Mosman wharf. The existing wharf is a pontoon, with a non-compliant connecting gangway and stairs leading up to the cul-de-sac at the end of Musgrave Street.

The proposal would ensure that South Mosman wharf would meet legislative requirements under the DDA and the DSAPT. Upgrading the wharf would also improve the efficiency and safety of the wharf and the public transport experience for customers.

A number of options were considered during concept design including the 'do-nothing' option. Although having the lowest capital cost and least environmental impacts, the 'do nothing option' was discounted as it would not meet the objectives of the proposal to improve accessibility by meeting the requirements of the DDA or DSAPT, nor improve passenger safety and comfort for future patronage.

Whilst the proposal presented in the REF best meets the project objectives, Transport for NSW acknowledges the proposal would still result in some environmental impacts such as loss of visual amenity and temporary impacts to transport. However, on balance the project is considered justified as the proposal would provide better commuter experience through improvements to passenger amenity, safety, access for people with a disability and overall user experience.

2.4 Consultation

Submission number(s)

5, 13, 14

Issue description

Three respondents requested meetings with Transport for NSW during public exhibition of the REF to discuss concerns about the proposal. In addition, two respondents requested they be consulted in the next stage of the design process, with one respondent requesting a copy of the final determination of the REF, including the conditions of approval.

Response

Following these requests, a number of individual meetings were held with Transport for NSW to discuss feedback on the proposal. Items raised during the meetings have been addressed in this Submissions report.

A final copy of the Submissions report, including a revised list of safeguards and management measures, will be made publicly available on the Transport for NSW website. Further consultation will be undertaken with properties adjacent to the proposal during detailed design.

Should the proposal proceed to construction, consultation with the community and stakeholders would continue throughout the construction phase.

2.5 Biodiversity

Submission number(s)

34

Issue description

DPI Fisheries has no objections to the proposal, and noted the following:

- A part 7 permit under the FM Act is not required for the proposal

- Consultation undertaken during preparation of the REF fulfils notification requirements under section 199 of the *Fisheries Management Act 1994* (FM Act)
- A section 37 permit under the FM Act is required for seahorse relocation works, and pre-clearance surveys for Whites Seahorses must be under during the 24 hours prior to commencing waterside work.

Response

It is noted that DPI Fisheries has no objections to the proposal. DPI Fisheries has also confirmed that a permit to harm to marine vegetation is not required and that section 199 requirements have been fulfilled.

The aquatic ecology assessment carried out to support the REF, indicated there is potential for White's Seahorse within proximity to the works. As such, safeguards in the REF include preparation of a White's Seahorse relocation plan and requirements for a section 37 permit and pre-clearance targeted surveys prior to construction.

2.6 Noise and vibration

2.6.1 Noise impacts (day)

Submission number(s)

5, 14

Issue description

Two respondents raised concerns regarding potential construction noise impacts during the day as they work from home. One respondent suggested that residents receive a schedule of the high-noise generating works earlier than the existing 7-day notification period, to enable residents to schedule alternative working arrangements. Two respondents suggested residents be provided with alternative accommodation during construction.

Response

Transport for NSW acknowledges there would be noise impacts during construction. The noise levels predicted in the REF were for the worst case scenario with all noise sources operating simultaneously within the construction footprint. In practice, noise experienced by nearby receivers is likely to be substantially lower than the noise model predictions.

To minimise potential noise impacts to the local community a Construction Noise and Vibration Management Plan (CNVMP) would be prepared prior to construction and implemented throughout the construction period. Construction works would be undertaken primarily during daytime hours however, for safety reasons calm water may be required during pile installation and for intricate lifts. Calm water in the harbour occurs late at night or very early in the morning therefore some activities may need to be carried out at this time, with a maximum of about 30 night shifts (from 11pm to 7am) proposed across the construction period of up to six months.

The CNVMP would outline mitigation measures in line with the Transport for NSW *Construction Noise and Vibration Guidelines* (RMS, 2016) which, depending on predicted noise levels, may include notifications, phone calls, respite periods, alternate accommodation and noise monitoring. Once in construction, Transport for NSW would work with the community to monitor and manage noise impacts.

Following consideration of submissions, Transport for NSW will provide an indicative schedule of the high-noise generating works, once available, and look to increase the lead time of the high-noise generating works notifications where possible.

2.6.2 Working hours

Submission number(s)

5, 27

Issue description

Two respondents raised concerns about the working hours. One respondent suggested consulting with residents about a condensed timeline for construction, and was concerned about out of hours works and requested alternate accommodation during these periods. The second respondent requested that work hours to be limited to 8am until 3pm.

Response

Transport for NSW is required to undertake construction work during standard working hours where possible. Standard hours are Monday to Friday (7am to 6pm) and Saturday (8am to 1pm). For safety reasons it is noted some works (e.g. piling) would be undertaken at night or in the early morning.

Based on these restrictions, construction is expected to take up to six months to complete. However, a detailed work schedule, to be prepared by the construction Contractor, would investigate options to reduce this timeframe.

Reducing the daily working hours to 8am to 3pm would increase the length of construction and is not considered practical.

As detailed in section 2.6.1 the CNVMP would outline mitigation measures to address potential noise impacts, including night time works. Once in construction, Transport for NSW would work with the community to monitor and manage noise impacts.

2.6.3 Piling

Submission number(s)

5

Issue description

One respondent raised concerns that installation of the piles would take much longer than what was stated in the REF and suggested the timing be verified by geotechnical investigations.

Response

During piling activities, a work schedule similar to the following may be adopted:

- Drilling of piles (preferred method)
 - Setup: 11pm to 12am (approximately)
 - Drilling: 12am to 6am (approximately)

- Pack up: 6am to 7am (approximately)
- Hammering of piles (alternative method)
 - Setup: 4am to 5am (approximately)
 - Hammering: 5am to 7am (approximately)
 - Pack-up: 7am to 8am (approximately).

During hammering, it is anticipated that each pile would be hammered for one minute (about 10 hits with a hammer within one minute). For each pile the activity is likely to occur about five times over a period of one hour.

The geotechnical requirements of the project would be further investigated during detailed design. The specific construction work schedule for piling would be determined by the construction contractor.

2.6.4 Vibration impacts

Submission number(s)

5

Issue description

The respondent requested dilapidation surveys be completed prior to the start of works and at completion of construction activities to monitor any vibration impacts from the works on residential properties (including buildings, seawalls and footpaths).

Response

Transport for NSW acknowledges there may be potential vibration impacts during construction from the use of equipment such as piling rigs and vibratory rollers. A vibration assessment was undertaken during preparation of the REF to assess impacts to both heritage structures and residential buildings in proximity to construction work.

Controls to manage vibration would be implemented for those structures identified within the safe working distance zone. Additionally, dilapidation surveys would be undertaken prior to and after the completion of construction activities. These requirements would be outlined in the CNVMP which is prepared by the construction contractor prior to commencement of work.

2.6.5 Other

Submission number(s)

13

Issue description

The respondent is unclear how construction noise would impact them based on the information provided. Following receipt of this submission the respondent met with Transport for NSW to discuss their feedback on the proposal.

Response

A noise and vibration impact assessment has been carried out as part of the REF to predict construction noise impacts on nearby sensitive receivers. The assessment is provided in section 6.4 and Appendix E of the REF.

The predicted noise levels at the closest residential property to the north of the proposal would vary between being clearly audible (55-65 dB(A)) to highly intrusive noise levels (>75 dB(A)) depending on the stage of construction. It is noted however that these predicted noise levels are for the worst case scenario with all noise sources operating simultaneously within the construction footprint. As such, in practice noise experienced by nearby receivers is likely to be substantially lower than the noise model predictions.

Should the proposal proceed to construction, Transport for NSW would work with the community to manage noise impacts which would include noise monitoring during high noise generating works.

2.7 Landscape character and visual impact

Submission number(s)

1, 10, 14, 31, 33

Issue description

A number of respondents raised concerns about the landscape character and visual impacts of the proposed design, noting that the proposed development should be more sympathetic to the local environment. Respondents indicated the proposed upgrade would have visual impacts on the Harbour foreshore, the natural environment and streetscape, and would also impact on the entry to Mosman Bay.

Respondents raised concerns about the height of the lift in the proposed design and questioned whether it would be feasible to reduce the height of the lift. Mosman Council encouraged the provision of landscaping to soften the appearance of the structure and requests the proposed design be modified so the new structure is more sympathetic to the natural environment, for example, use of a living wall.

Response

Transport for NSW acknowledges the visual amenity concerns raised regarding the proposed design.

The design of the wharf would be consistent with other wharfs in Sydney Harbour. The curved roof is designed to be low profile and minimise the impact on the views to and from the water.

A landscape character and visual impact assessment (LCVIA) was prepared to identify the overall impact of the proposed works on each of the Landscape Character Zones (LCZ) in the area and to identify the visual changes and impacts on the site and its surroundings when viewed from key vantage points. The landscape character assessment concluded that overall the proposal would have a moderate to high potential impact on the surrounding LCZs and overall the visual impact from key vantage points was considered moderate.

The proposed configuration of the new wharf was based on a number of design requirements including the need to minimise movement of the pontoon (thereby maximizing customer comfort and safety), avoiding existing moorings and allowing the wharf to be accessible in all tidal states.

Whilst the current proposal would introduce a new visual element to the existing landscape and would involve loss of some foreshore vegetation and trees, the potential impacts would be further minimised during detailed design through material selection, replanting, landscape treatment and design refinement.

The current design includes a steel framed lift. The overall height of the lift (as seen from water) would be around 15-16 metres, with around 7.5 metres of this structure visible from street level. During detailed design, Transport for NSW will investigate the option of reducing the lift height and the option of adding a green/living wall on the lift.

The area of proposed vegetation and tree removal in the REF is the worst case scenario. During detailed design Transport for NSW will aim to minimise vegetation removal and retain as many existing trees as possible. At completion the area would be replanted and landscaped with native vegetation local to the Sydney region in consultation with Mosman Council to reinstate the green space and minimise visual/privacy impacts. During detailed design Transport for NSW will also investigate the option of adding a green/living wall on the lift.

2.8 Transport, traffic and access

2.8.1 Alternative public transport during construction

Submission number(s)

5, 18, 26

Issue description

One respondent raised concerns that the closure of the wharf for the construction period would result in longer travel times and inconvenience, suggesting that an express bus route from Mosman to the city be implemented. One respondent was concerned that they would not be able to catch a bus to and from the wharf during construction. Two respondents also noted that the local 236 bus route has recently been replaced by bus route 111.

Response

The existing wharf would be closed and all ferry services suspended for up to six months (depending on weather) to allow for the safe construction of the new wharf. During this time commuters would need to use alternate transport. Alternative public transport options that would be available during the wharf closure include using ferry services at Mosman Bay wharf, local bus services including bus route 111 and train services at North Sydney and Milsons Point stations.

Existing bus services would be used to support access to Sydney CBD as bus transport would remain operational during construction, with the exception of when works are occurring near the bus stop at the wharf. Transport for NSW would aim to minimise the impact to the bus service through working out of hours where required, and outside peak patronage.

Transport for NSW acknowledges that bus route 236 is no longer in service and has been replaced by the bus route 111 which travels between South Mosman wharf and Chowder Bay. Bus route 111 connects to bus route 100 (corner of Raglan Road and Military Road) which connects to the CBD. Discussions will be held with the State Transit Authority to determine if bus services need to be increased and operating hours extended to cater for the potential increase in demand during the construction period.

An express bus service to connect South Mosman wharf with the CBD is not feasible given the existing low patronage at the wharf.

Ferry users would be notified ahead of construction and updated whilst the project is being built.

Operation of the proposal would provide benefit to the community through improving accessibility, amenity, safety and overall user experience for all passengers including those with low mobility.

2.8.2 Construction traffic management

Submission number(s)

5, 6, 33

Issue description

Three respondents raised concerns about construction traffic management during construction of the proposal. One respondent requested clarification on how access to private properties would be impacted and was concerned that access could be impacted by the additional bus services on Musgrave Street. The respondent also requested consultation prior to any change in access arrangements and noted the REF incorrectly refers to 2 Musgrave Street as 2A Musgrave Street.

One respondent raised concerns about parking in the vicinity of the works as well as access for emergency vehicles during construction. The respondent suggested that the area below the bus shelter, adjacent to the reserve, be made a no parking zone.

Mosman Council requested that a Traffic Management Plan (TMP) be provided to demonstrate how construction traffic would be managed.

Response

A further review of traffic impacts, including emergency services access and existing bus services and frequencies, would be undertaken during preparation of the detailed design and the TMP.

The TMP would be prepared before the commencement of works and in consultation with Mosman Council and the State Transit Authority (STA). The TMP would outline measures to minimise disruption to residents and the community during construction, and would include details on property and construction site access, parking arrangements and alternate pedestrian and cyclist access and transport.

Access to the surrounding properties would be maintained at all times throughout the construction phase (including for emergency vehicles) and notification of changes to access would be provided in advance. Any change to current parking zones and or restrictions would be discussed with Mosman Council during preparation of the TMP.

Transport for NSW would consult with affected residents prior to commencement of construction works and look to minimise impacts where possible.

It is acknowledged that in parts, the REF incorrectly refers to 2 Musgrave Street as 2A Musgrave Street.

2.8.3 Wharf closure

Submission number(s)

9, 13, 15

Issue description

Respondents raised concerns about the closure length of the existing wharf during construction, with one respondent suggesting a temporary wharf be installed for use during construction of the new wharf. One respondent was unsure about when the wharf would be closed and for how long.

Response

Transport for NSW is required to undertake construction work during standard working hours where possible. Standard hours are Monday to Friday (7am to 6pm) and Saturday (8am to 1pm). For safety reasons it is noted some works (e.g. piling) would be undertaken at night or in the early morning.

Closure of the existing wharf and stopping ferry services would be limited to the time required to safely remove the existing wharf and construct the new wharf. Construction is expected to take up to six months to complete, depending on weather, however, the construction contractor would investigate options to reduce this timeframe when preparing the construction work schedule. Construction is proposed to commence in late 2021.

Transport for NSW considered the possibility of constructing a temporary wharf for customers during the wharf closure period, however it was deemed unfeasible due to cost, low wharf patronage and the availability of nearby alternate transport options in the area.

A Construction Environmental Management Plan (CEMP) would be prepared before the commencement of works and would outline measures to minimise disruption to residents and the community during construction. Ferry users would be notified ahead of construction and updated whilst the proposal is being built.

2.8.4 Other

Submission number(s)

25

Issue description

One respondent was concerned about how far the proposed design extends into Mosman Bay, thereby reducing the amount of space for boats to safely travel up and down the waterway.

Response

The proposed configuration of the new wharf was based on a number of design requirements including the need to minimise movement of the pontoon (thereby maximizing customer comfort and safety), avoiding existing moorings and allowing the wharf to be accessible in all tidal states.

The current design was developed with key maritime stakeholders and allows for safe passage of vessels entering and leaving Mosman Bay, however the final configuration would be determined during detailed design and consideration would be given to moving the pontoon further east towards the shoreline.

2.9 Social

2.9.1 Privacy

Submission number(s)

5, 13, 14

Issue description

Three respondents raised concerns that the current proposal would impact on privacy as the design would allow ferry patrons visibility into their residential properties. Privacy concerns relate to the following aspects of the design which allow greater line of sight to residential properties:

- Position of the current pontoon (located further north and west than the existing pontoon)
- Position of the lift and stairs
- Use of clear glass screens on the pontoon and lift structure
- Removal of established trees on the foreshore, particularly along the boundary of the wharf site and the adjacent residential property (noting the trees also provide shade).

In addition, the respondents suggested a number of design alternatives around position of wharf features and selection of materials.

Response

Transport for NSW acknowledges the concerns raised regarding the privacy of residential properties.

The proposed configuration of the new wharf was based on a number of design requirements including the need to minimise movement of the pontoon (thereby maximizing customer comfort and safety), avoiding existing moorings and allowing the wharf to be accessible in all tidal states.

It is noted that following community consultation on the concept design the lift and stair structures were shifted to the south to reduce impacts on local houses and the entrance to the wharf was moved away from the bus turning circle to improve pedestrian safety. Transport for NSW will investigate opportunities to refine the design to address the privacy issues raised while maintaining accessibility requirements, including:

- Re-positioning the wharf structure further to the south and east and away from residential properties
- Re-positioning the stairwell and lift
- Considering the use of different materials on the pontoon, lift and stair structures (e.g. frosted glass)
- Incorporating a green/living wall on the side of the lift.

During detailed design the Transport for NSW will aim to minimise vegetation removal and retain as many trees as possible, including along the boundary of the compound site and adjacent residential properties.

At completion the area would be replanted and landscaped with native vegetation local to the Sydney region in consultation with Mosman Council to reinstate the green space and minimise visual/privacy impacts.

2.9.2 Boundary fencing

Submission number(s)

5, 14

Issue description

The respondents note there is currently no boundary fence between the Transport for NSW land and the adjacent residential property, however the significant amount of dense bushland currently delineates the boundary. As the proposal would remove some of this vegetation respondents are concerned about community members accessing the residential areas.

Response

During construction Transport for NSW would construct a fence around the site compound and where possible would limit clearing of the surrounding vegetation, particularly along the boundary of the compound site and residential properties.

Transport for NSW has considered this feedback and would install a fence after construction is completed to improve separation between the wharf land and private property. Fence details would be determined during detailed design in consultation with residents.

2.9.3 Recreational fishing

Submission number(s)

7, 8, 14

Issue description

Three respondents expressed their concerns with recreational fishing from the existing wharf. Respondents indicated negative impacts such as mess (fish remains, hooks, rubbish) odour and noise. One respondent suggested the implementation of a wharf cleaning service or to prohibit fishing from the new wharf.

Response

Recreational fishing in Sydney Harbour is regulated by the DPI Fisheries and is currently permissible at the existing South Mosman wharf and will be permissible at the new wharf.

Signage would be installed on the new wharf to inform and remind the fishing community of the requirements of responsible fishing, which includes consideration of nearby residents, other wharf and park users, keeping noise to a minimum and not leaving hooks, bait and fishing lines at the wharf.

2.10 Non-Aboriginal heritage

Submission number(s)

10, 33

Issue description

One respondent raised concerns about the impacts of the proposal on the heritage listed Group of 2 houses, divided into 3 dwellings (LEP no. I183), believing the proposal would impact on the heritage characteristics of the item. Mosman Council did not raise any objection to the proposal on heritage grounds, and encourages the provision of heritage interpretation signage as part of the proposal.

Response

Transport for NSW prepared a Statement of Heritage Impact (SOHI) during preparation of the REF to determine the direct and indirect impacts of the proposal on heritage items in the area (refer Section 6.6 and Appendix G of the REF). The assessment notes that the proposed works are located outside of the curtilage of Group of 2 houses, divided into 3 dwellings (LEP no. I183). As a result, there would be no direct impacts to the heritage item. The heritage item (LEP no. I183) is located within the minimum safe working distance for cosmetic damage, the vibrations associated with the proposed works could result in potential direct impacts. However, as the structure is located further away from the main works it is expected that any potential direct impacts resulting from vibrations would be negligible. Dilapidation surveys would be undertaken for structures located within the safe working distance prior to and at the completion of works. Specialist advice would also be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works would potentially result in impacts to heritage structures. Vibration monitoring would be carried out to confirm vibration levels prior to construction commencement.

As the heritage item (LEP no. I183) is located on the upper level of Musgrave Street, it is anticipated that the houses would have views of the proposal. The construction of the new wharf and associated features would therefore introduce new visually intrusive elements within sight of the heritage item. While the new wharf would be largely obscured by the terrain, the new lift and stairs would be more visible. During detailed design Transport for NSW will investigate opportunities to reduce the visual impacts of the proposal including: considering the use of different materials on the pontoon, lift and stair structures (e.g. frosted glass), incorporating a green/living wall on the side of the lift and reducing the height of the lift.

The new structures would not obstruct views from the houses across Mosman Bay to Cremorne or views towards the heritage item. As a result, the proposal would result in a negligible visual impact to the heritage item (LEP no. I183). Transport for NSW acknowledges the importance of heritage interpretation in the area. Opportunities for implementation of heritage interpretation would be investigated during detailed design. A Heritage Interpretation Strategy (HIS) would be prepared for the proposal outlining various media for heritage interpretation appropriate to the location and heritage significance of the South Mosman wharf. Interpretation may include heritage signs and/or artwork pieces.

The HIS would be consistent with the recommended management for Musgrave Street wharf site (SHI no. 4920109) that is outlined in the SHI sheet for the Roads and Maritime s170 Heritage and Conservation listed item, which states that 'The wharf waiting shelter provides opportunities for interpretation of the history and significance of the wharf, the ferry system and other heritage elements within their visual catchment which should be explored and developed'.

2.11 Other

2.11.1 Wharf name

Submission number(s)

3, 6

Issue description

Two respondents requested for the wharf to revert to the original name, Musgrave Street wharf.

Response

The objective of the project is to make the wharf accessible. As such, we are not considering a name change as part of this project.

2.11.2 General construction impacts

Submission number(s)

5, 13

Issue description

One respondent is concerned about general construction impacts from operation of the compound area such as noise, light and privacy. Concern was also raised over utility work in close proximity to their residence. The second respondent feels that not enough information on construction impacts have been provided. Following receipt of these submissions respondents met with Transport for NSW to discuss their feedback on the proposal.

Response

Transport for NSW acknowledges that construction of the proposal may result in temporary impacts to the local community such as noise, dust, visual amenity and parking impacts. These construction impacts are discussed and assessed in the REF and would be updated during detailed design where required.

Through detailed design Transport for NSW would get a better understanding of the required utilities work for the proposal. At this stage significant utilities work in front of residential properties on Musgrave Street are not anticipated.

All construction related impacts would be appropriately managed prior to and during construction through implementation of a Construction Environmental Management Plan (CEMP). The CEMP would outline monitoring requirements (e.g. noise and air quality) and requirements for the site compound (e.g. fencing, position of plant and equipment). Where possible lighting towers would be directed away from residential properties. Updates would be provided to the community during construction to provide information on the works, such as out of working hours, high noise generating activity, access impacts and utility use. Further detail on privacy issues is provided in section 2.9.1.

Operation of the proposal provides justification over the temporary impacts, as it would benefit the community through improving passenger accessibility, amenity, safety and overall user experience. It is anticipated that the proposal would also have indirect wider community benefits, through ensuring

continuation of the wharf for its expected lifespan (50 years). This extends to the cultural and amenity benefit of continuing to operate a wharf in this location.

2.11.3 Seawall

Submission number(s)

5, 13

Issue description

Respondents are concerned that the seawall located at the residential property adjacent to the proposal may be damaged during construction. One respondent noted that any damage to seawall as a result of proposal must be repaired by Transport for NSW, and that written permission is required should waterside works be undertaken within 4 metres of the seawall, including mooring of barges or equipment.

Response

Transport for NSW understands the concerns raised regarding the private seawall adjacent to the proposal.

The proposed work would be located further south and it is not anticipated there would be a need to impact this part of the seawall. The only works involving the seawall would include minor remediation at the location of the existing wharf, following removal of the existing wharf, if required. In addition, waterside works are not proposed within the vicinity of the private seawall.

3. Environmental assessment

3.1 Biodiversity

The endangered listing of White's Seahorse (*Hippocampus whitei*) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was gazetted on 12 December 2020.

The Biodiversity Assessment Report (BAR) prepared as part of the REF (TfNSW, 2020) considered the White's Seahorse to have a high likelihood of occurrence in the biodiversity study area based on nearby records and the presence of suitable habitat. The BAR included an assessment of impacts on the White's Seahorse in the context of its endangered listing under *the Fisheries Management Act 1994* (FM Act), however at the time was not required to give consideration of its listing as a Matter of National Environmental Significance (MNES) under the EPBC Act.

3.1.1 Methodology

An Assessment of Significance (AoS) for the White's Seahorse under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was completed by Dilys Zhang (BSc Hons.), an ecologist for Cardno. The AoS has been completed in accordance with the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DoE, 2013).

3.1.2 Description of existing environment

White's Seahorse is known to be present in Port Jackson. The study area possesses sub-optimal habitat for the species and it is not known to disperse (either as adults or juveniles) great distances from the birth sites. Potential habitat in the study area occurs as low to medium relief rocky reefs and the submerged sections of the existing artificial structures

3.1.3 Potential impacts

The AoS for the White's Seahorse under the EPBC Act is provided in Appendix B.

The proposal would temporarily remove potential habitat for the species. However, lost potential habitat would be reinstated (twice the area than that lost). The proposal is unlikely to fragment the population of White's Seahorse in the harbour, disrupt the breeding cycle of the species, introduce or spread invasive species or disease that may adversely impact the species or interfere with any recovery objectives. Thus, the proposal is unlikely to significantly impact White's Seahorse and a referral to the Department of Agriculture, Water and the Environment (DAWE) is not required.

3.1.4 Revised safeguards and management measures

Mitigation measure B9 in the REF has been modified as a result of the EPBC Listing of the White's Seahorse (refer Table 4-1).

4. Environmental management

The REF for the South Mosman wharf upgrade identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (section 7.2 of the REF).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures have been revised to mitigate potential impacts. Additional safeguards have been included around extending bus operating hours and outlining aspects to consider during detailed design.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

4.1 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, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, Safety, Environment and Regulation, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The EMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 – Traffic Management.

4.2 Summary of safeguards and management measures

The REF for the South Mosman wharf upgrade identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the proposal (refer to Chapter 7 of the REF) have been revised. Should the proposal proceed, the environmental management measures in Table 4-1 will guide the subsequent phases of the proposal.

Additional and/or modified environmental safeguards and management measures to those presented in the REF have been underlined and italicised and deleted measures, or parts of measures, have been struck out.

Table 4-1: Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity.</p> <p>As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor / Transport for NSW	Pre-construction / Detailed design
GEN2	General - notification	All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor / Transport for NSW	Pre-construction
GEN3	General – environmental and sustainability awareness	<p>All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular ‘toolbox’ style briefings. Sustainability initiatives and targets will also be addressed.</p> <p>Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include:</p> <ul style="list-style-type: none"> • Areas of non-Aboriginal heritage sensitivity • Adjoining residential areas requiring particular noise management measures • Waterside impacts. 	Contractor / Transport for NSW	Pre-construction / Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
LS1	Land surface and hydrology	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion, contamination and water pollution and describe how these risks will be addressed during construction.	Contractor	Pre-construction
LS2	Land surface and hydrology	Any excavated sediments or soil that require disposal will be sampled, tested and classified in accordance with the EPA's <i>Waste Classification Guidelines: Part 1 Classifying Waste</i> (EPA, 2014) prior to being disposed of at a waste facility licensed to accept the relevant class of waste. Any materials classified as Hazardous Waste may require treatment or an immobilisation approach in accordance with Part 10 of the Protection of the Environment Operations (Waste) Regulation 2014 prior to off-site disposal.	Contractor	Construction
LS3	Land surface and hydrology	Clean and suitable topsoil will be stockpiled and reused on site where appropriate.	Contractor	Construction
LS4	Land surface and hydrology	An intrusive soil investigation to the depth of excavation will be undertaken to ensure the safety of construction workers and provide waste classification of the materials to be removed.	Contractor	Construction
LS5	Land surface and hydrology	If unexpected contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA.	Contractor	Construction
LS6	Land surface and hydrology	The piling methodology shall seek to mitigate the risk of sediment dispersal.	Contractor	Construction
LS7	Land surface and hydrology	Site specific Erosion and Sediment Control Plan/s will be prepared and implemented as part of the SWMP. Control measures are to be implemented and maintained (in accordance with the Landcom/Department of <i>Housing Managing Urban Stormwater, Soils and Construction Guidelines</i> , the Blue Book) to: <ul style="list-style-type: none"> • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site 	Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Minimise the amount of material transported from site to surrounding pavement surfaces Divert clean water around the site. 		
LS8	Land surface and hydrology	<p>Prior to commencement of construction activities, sediment control device (such as sediment boom and curtain) will be installed around the construction footprint to contain disturbed sediment from the water surface by allowing suspended sediments to settle back on the bottom of the seabed overtime. The silt boom and curtain will extend from a minimum of 100 millimetres above the water line to a minimum of 2.5 metres below the water line before starting work.</p> <p>Installation should be undertaken during high tide periods from a boat. The device should be designed to rise and fall with the tide to prevent disturbance. Inspection of the device should be undertaken on a daily basis after ebbing tides, with additional inspection be carried following storm events. Monitoring of turbidity inside and outside of the device should also be performed, using a portable turbidity meter/logger. Prior to removing the sediment control device, conditions within the curtain will be assessed visually and with a field instrument to verify that sediment has settled resulting in similar water turbidity to that outside the curtain.</p>	Contractor	Construction
LS9	Land surface and hydrology	<p>Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls.</p> <p>Results of the observations are required to be recorded. Records are required to be kept on the site and to be made available for inspection by persons authorised by Transport for NSW.</p>	Contractor	Construction
LS10	Land surface and hydrology	The number of jack-ups/anchor points will be minimised where possible. The locations will be selected to avoid areas of sensitive habitat.	Contractor	Construction
LS11	Land surface and hydrology	Work associated with positioning barges, drilling and pile driving will occur during calm conditions to prevent excessive scouring and other impacts.	Contractor	Construction
WQ1	Water quality	<ul style="list-style-type: none"> A spill management plan will be developed and communicated to all staff working on site. 	Contractor	Pre-construction / Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Appropriate land and aquatic spill kits are to be maintained on site and on barges. Aquatic spill kits must be specific for working within the marine environment. The spill kit must be appropriately sized for the volume of substances at the work site. All workers will be advised of the location of the spill kit and trained in its use. 		
WQ2	Water quality	If an incident (e.g. spill) occurs, the Transport for NSW <i>Environmental Incident Classification and Reporting Procedure</i> is to be followed and the Transport for NSW Contract Manager notified as soon as practicable.	Contractor	Construction
WQ3	Water quality	In the event of a maritime spill, the incident emergency plan will be implemented in accordance with Port Authority of NSW's response to shipping incidents and emergencies outlined in the <i>NSW State Waters Marine Oil and Chemical Spill Contingency Plan</i> (RMS, 2016c).	Contractor	Construction
WQ4	Water quality	Emergency contacts will be kept in an easily accessible location on vehicles, vessels, plant and site office. All workers will be advised of these contact details and procedures.	Contractor	Pre-construction / Construction
WQ5	Water quality	Vehicles, vessels and plant must be properly maintained and regularly inspected for fluid leaks.	Contractor	Construction
WQ6	Water quality	No vehicle or vessel wash-down or re-fuelling will occur on-site.	Contractor	Construction
WQ7	Water quality	Any chemicals or fuels stored at the site or equipment barges will be stored in a bunded area.	Contractor	Construction
WQ8	Water quality	An environmental work method statement (EWMS) will be developed for the removal of the existing wharf structure to minimise the risk of pollutants and debris entering the waterway. The EWMS must be approved by Transport for NSW prior to the demolition of the existing wharf structure.	Contractor	Pre-construction
WQ9	Water quality	Consideration of water sensitive urban design (WSUD) principles in line with the <i>Water sensitive urban design guideline</i> (RMS, 2017).	Transport for NSW	Detailed design
B1	Biodiversity	Integrate the management of flora and fauna into the construction environmental management plan (either as a standalone flora and fauna management plan or a	Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>subplan). This is to include all terrestrial and marine flora and fauna and include but not be limited to such measures as:</p> <ul style="list-style-type: none"> • Documenting and establishing site clearing limits • Establishment of no go zones • Implementation of tree protection measures • Pre-clearing surveys, vegetation removal, unexpected finds measures in line with the <i>Biodiversity Guidelines</i> (RTA, 2011). 		
B2	Biodiversity	Native vegetation and habitat removal will be minimised through detailed design with focus to retain vegetation along the boundary of the compound site and 2 Musgrave Street	Transport for NSW	Detailed design
B3	Biodiversity	Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011). Any roosting microbats in the vegetation and wharf structures to be removed and the escarpment area to be impacted will be captured and relocated to similar or higher condition habitat. Release will only be done at dusk and roosting individuals should be kept in a secure, dark and warm location until then. Injured individuals or unfurred juveniles are to be transported to a veterinarian.	Contractor	Pre- construction
B4	Biodiversity	Vegetation and habitat removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Contractor	Construction
B5	Biodiversity	Native vegetation will be re-established in accordance with Guide 3: Re-establishment of native vegetation of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011). Replacement plantings (species and number) will be determined in consultation with Mosman Council to reinstate habitat and minimise visual impacts.	Contractor	Detailed design / Post construction
B6	Biodiversity	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the construction footprint.	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
B7	Biodiversity	Considerations during detailed design to promote colonisation of habitat-forming species could include the installation of structures which provide habitat complexity (e.g. designs available as part of the Living Seawalls Project).	Contractor	Detailed design
B8	Biodiversity	Minimise anchoring where possible and avoid anchoring on subtidal rocky reef habitat.	Contractor	Construction
B9	Biodiversity	Complete a targeted survey for Black Rockcod and White's Seahorse within 24 hours prior to the commencement of water-based construction activities. Black Rockcod individuals will be encouraged to move away from the study area and White's Seahorse will be captured and relocated to nearby similar habitat <u>using methods approved by DPI Fisheries</u> . A White's Seahorse relocation plan will be developed in consultation with NSW DPI (Fisheries) to dictate this activity. <u>These activities are to be completed by a qualified marine ecologist</u> .	Transport for NSW	Pre-construction
B10	Biodiversity	A Section 37 permit under the FM Act to relocate Syngnathids collected during the targeted pre-clearance survey will be required as part of the White's Seahorse relocation.	Transport for NSW	Construction
B11	Biodiversity	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011) and Section 3.3.2 Standard precautions and mitigation measures of the <i>Policy and guidelines for fish habitat conservation and management Update 2013</i> (NSW DPI, 2013).	Contractor	Construction
B12	Biodiversity	Piling to stop if marine mammals are observed within 100 metres of the project area and only to recommence once they have moved beyond 100 metres of the project or are not seen for at least 20 minutes.	Contractor	Construction
B13	Biodiversity	The detailed design will aim to avoid/minimise any impact to coastal processes and hydrology.	Transport for NSW	Detailed design
B14	Biodiversity	Fauna will be managed in accordance with Guide 9: Fauna handling of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
B15	Biodiversity	Weed species will be managed in accordance with Guide 6: Weed management of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Contractor	Construction
B16	Biodiversity	Marine pest species will be managed within the construction footprint.	Contractor	Construction
B17	Biodiversity	Pathogens will be managed in accordance with Guide 2: Exclusion zones of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Contractor	Construction
B18	Biodiversity	Water-based equipment and vessels to be sourced from local suppliers. Equipment and vessels must be cleaned and inspected prior to entering the construction footprint.	Contractor	Construction
B19	Biodiversity	Occurrence of any marine pests must be reported to DPI Fisheries.	Contractor	Construction
B20	Biodiversity	Shading and artificial light impacts will be minimised through detailed design.	Transport for NSW	Detailed design
NV1	Noise and vibration	<p>Preparation of a noise and vibration management plan based on recommendations provided within the NSW ICNG and Australian Standard AS 2436-1981: <i>Guide to Noise Control on Construction, Maintenance and Demolition Sites</i>. This is to include, but not be limited to:</p> <ul style="list-style-type: none"> • Plant controls: <ul style="list-style-type: none"> ○ Use of noise attenuating controls at the source, such as mufflers, acoustic screens, etc. ○ Plant and equipment will be in good working order to prevent excess noise generation. ○ Locating static sources of noise such as the generators as remotely as possible from noise sensitive receivers ○ Use of broadband reversing alarms, or “quackers”, on mobile equipment in accordance with the relevant health and safety regulations ○ Use of temporary noise barriers where practical. The height and location of these barriers will be determined during preparation of the construction noise and vibration management plan when more 	Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>information regarding the proposed plant to be used for each construction stage is available.</p> <ul style="list-style-type: none"> ○ Investigate whether “at plant” mitigation or muffled plant is available for plant with high source noise levels such as rock hammers and piling rigs, and plant emitting continuous noise such as generators. ○ Acoustic curtains (generally loaded vinyl based products), attached to wire construction fencing or laid over steel scaffold can also provide practical temporary noise barriers. Acoustic curtains will be investigated for stationery plant within the worksites once a detailed schedule of works and plant is available. <ul style="list-style-type: none"> • Management and behavioural controls: <ul style="list-style-type: none"> ○ Ensure that managers effectively communicate acceptable and unacceptable work practices for the site, through staff site inductions, notice boards, and prestart meetings. ○ Avoid the need for reversing in the construction area by creating a loop road or similar. ○ Avoid dropping materials from height. ○ Workers will avoid shouting, minimise talking loudly, and avoid slamming vehicle doors. • Allowing construction to occur only during approved construction hours, unless otherwise required as a condition of TfNSW safety requirements • Conducting noise monitoring during all construction phases/scenarios considering the potential exceedances for the purposes of assisting in noise mitigation and to verify the findings of this noise assessment. • Implementing a procedure for dealing with complaints to ensure that all complaints are registered and dealt with appropriately. • Conducting additional monitoring if complaints are received or proposed activities and number of plant exceed those assumed in this assessment. • Modifying work activities where noise or vibration is found to cause unacceptable impact. 		

No.	Impact	Environmental safeguards	Responsibility	Timing
		Implementation of additional mitigation measures in accordance with the CNVG including notification, respite periods and alternate accommodation as reasonable and feasible.		
NV2	Noise and vibration	<ul style="list-style-type: none"> Carrying out works within standard daytime hours as follows: <ul style="list-style-type: none"> 7:00 am to 6:00 pm Monday to Friday 8:00 am to 1:00 pm Saturdays, no work on Sundays or public holidays. Do not carry out operations during evening or night-time hours, unless required for safety reasons when the water is calmer during the night period (including early morning) or due to requirements to enable bus access. Should operations be required outside standard hours, an Out of Hours Procedure detailing works schedule, approval process, communications requirements and management measures will be prepared. All reasonable and feasible efforts should be undertaken to ensure noise levels will not exceed the ICNG noise management levels stated in section 6.4.3 <i>of the REF</i> this assessment by carrying out night-works with reduced numbers of plant for example. 	Contractor	Construction
NV3	Noise and vibration	<ul style="list-style-type: none"> Notification of potentially affected receivers detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule <i>for the high-noise generating works</i> and over the night time period, any operational noise benefits from the work (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of work. <i>Look to increase the lead time on notification of high-noise generating works where possible.</i> A contact telephone number and email address will be available for community feedback. 	Transport for NSW / Contractor	Pre-construction
NV4	Noise and vibration	Conduct short term background noise monitoring prior to construction to confirm the ambient noise levels presented in this report, which were carried out during COVID 19 and may not be representative of typical levels.	Transport for / Contractor	Pre-construction
NV5	Noise and vibration	Where works are proposed within the safe working limits for the heritage structures (the original seawall and retaining wall in Musgrave Street wharf site	Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		(SHI no. 4920109 and LEP no. A491), the rock face of the Divided road (LEP no. I411), or the buildings in Group of 2 houses, divided into 3 dwellings (LEP no. I183)), specialist advice will be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works will potentially result in impacts to heritage structures. Vibration monitoring will be carried out to confirm vibration levels prior to construction commencement.		
NV6	Noise and vibration	<p>Regular inspections of the construction activities and work areas will be undertaken by structural engineers and any other required specialist to monitor and review the construction methodology and confirm the integrity of the seawall and retaining wall in Musgrave Street wharf site (SHI no. 4920109 and LEP no. A491), the rock face of the Divided road (LEP no. I411), or the buildings in Group of 2 houses, divided into 3 dwellings (LEP no. I183). Assessment and monitoring of vibration impacts will adhere to:</p> <ul style="list-style-type: none"> • British Standard BS 7385: Part 2: Evaluation and Measurement for Vibrations in Buildings –Part 2 Guide to Damage Levels from Ground-Borne Vibration • German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures. 	Contractor	Construction
NV7	Noise and vibration	Where buildings are located within the safe working distance zone, dilapidation surveys will be carried out prior to construction <u>and at the completion of works</u> .	Contractor	Pre-construction / Construction
NV8	Noise and vibration	Where receivers are located within the safe work distance zones, vibration monitoring will be carried out to ensure compliance with the required criteria. If exceedances are recorded, works will be modified accordingly to reduce vibration levels.	Contractor	Pre-construction / Construction
LV1	Landscape and visual	<p>Urban design principles will be integrated throughout the detailed design and construction of the proposal and include:</p> <ul style="list-style-type: none"> • Similar visual structures (such as jetties, pontoons and wharfs) as those located within Neutral Bay, Neutral Harbour and Careening Cove • A coordinated palette of materials and colours to respond to the existing maritime and foreshore character 	Transport for NSW	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • Low-scale landside and waterside works to improve accessibility, wayfinding and services • The approaches to and surrounds of the wharf designed to maximise amenity and keeping with the existing urban and landscape environment. • Landscape treatment of the wharf to be appropriate and complimentary to the existing landscape. 		
LV2	Landscape and visual	Hoarding will be erected around the construction compound where possible, to reduce visibility.	Contractor	Construction
LV3	Landscape and visual	Where out of hours work is required, lighting will be directionally controlled to limit potential impacts of light spill on surrounding receivers, including residential properties.	Contractor	Construction
LV4	Landscape and visual	All impacted areas and ground surfaces, including grassed surfaces adjacent to the wharf and the road surface of Musgrave Street, must be reinstated as near as possible to their original state following the completion of works.	Contractor	Post-construction
H1	Non-Aboriginal heritage	If archaeological 'works' such as evidence of earlier road constructions are encountered during construction works and will be impacted, archaeological investigation and recording will be undertaken prior to impacts.	Contractor	Construction
H2	Non-Aboriginal heritage	If unexpected 'relics' are encountered during excavation, a section 146 relics notification will be forwarded to Heritage NSW, DPC. 'Relics' cannot be impacted without appropriate approvals under the <i>Heritage Act 1977</i> .	Contractor	Construction
H3	Non-Aboriginal heritage	If significant archaeological remains are encountered during excavation, design options for avoiding impacts to the significant archaeological remains should be considered where practicable and opportunities should be investigated for the implementation of heritage interpretation.	Contractor	Construction
H4	Non-Aboriginal heritage	A heritage induction will be provided to workers prior to construction, informing them of the location and significance of known heritage items and the implementation of the Roads and Maritime <i>Unexpected Heritage Item Procedure</i> (RMS, 2015) if unanticipated heritage items or depositions are located during construction. The heritage induction will include management of expected non-	Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		significant archaeological remains, such as minor artefactual material associated with Phase 2 reclamation fills.		
H5	Non-Aboriginal heritage	The Roads and Maritime <i>Unexpected Heritage Item Procedure</i> (RMS, 2015) will be implemented if unanticipated heritage items or depositions are located during construction.	Contractor	Construction
H6	Non-Aboriginal heritage	If vibration monitors are attached to the retaining wall in Musgrave Street wharf site (SHI no. 4920109 and LEP no. A491), the rock face of the Divided road (LEP no. I411), or the buildings in Group of 2 houses, divided into 3 dwellings (LEP no. I183), they must not be attached with permanent fixings. They should be removable without causing damage. Bees wax may be a suitable attachment method.	Contractor	Construction
H7	Non-Aboriginal heritage	If it is identified that levels of vibration are causing damage to heritage fabric, works must cease, and the construction methodology reviewed by the project engineers in consultation with a Heritage Consultant in order to mitigate further impacts. A temporary protection plan to outline protection measures required for significant fabric during activities causing potential vibration impacts will be prepared prior to commencement of works.	Contractor	Construction
LV4	Non-Aboriginal heritage	All impacted areas and ground surfaces, including grassed surfaces adjacent to the wharf and the road surface of Musgrave Street, must be reinstated as near as possible to their original state following the completion of works.	Contractor	Post-construction
H8	Non-Aboriginal heritage	In accordance with the sustainability requirements for the project, opportunities for implementation of heritage interpretation will be investigated during detailed design. A Heritage Interpretation Strategy will be prepared for the proposal to discuss various media for heritage interpretation appropriate to the location and heritage significance of the South Mosman wharf. Interpretation may include heritage signs and/or artwork pieces. This report will be consistent with the recommended management for Musgrave Street wharf site (SHI no. 4920109) that is outlined in the SHI sheet for the Roads and Maritime s170 Heritage and Conservation listed item, which states that 'The wharf waiting shelter provides opportunities for interpretation of the	Contractor	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		history and significance of the wharf, the ferry system and other heritage elements within their visual catchment which should be explored and developed”.		
H9	Non-Aboriginal heritage	As part of the preparation of the Heritage Interpretation Strategy the area around South Mosman wharf, Musgrave Street wharf site (SHI no. 4920109 and LEP no. A491) and Divided road (LEP no. I411) should be photographed to help document the changes to the area and the development of the South Mosman wharf.	Contractor	Pre-construction
H10	Non-Aboriginal heritage	If feasible, the extant timber beams that are visible in the seawall and are associated with the second Musgrave Street wharf and waiting room should be retained and re-use can be incorporated into the Heritage Interpretation Strategy.	Contractor	Construction
H11	Non-Aboriginal heritage	If design changes result in additional excavations and impacts to significant archaeological remains associated with Musgrave Street wharf site (SHI no. 4920109 and LEP no. A491), further archaeological assessment and management will be required.	Transport for NSW	Detailed design / Pre-construction
H12	Non-Aboriginal heritage	Any project redesign resulting in new ground disturbance, vegetation removal, or new features must be assessed in an addendum to the South Mosman wharf SOHI.	Transport for NSW	Detailed design / Pre-construction
AH1	Aboriginal heritage	Should the scope of the proposed work change, further consultation with Transport for NSW’s Aboriginal Cultural Heritage Officer and regional environmental staff must be undertaken to reassess any potential impacts on Aboriginal cultural heritage.	Transport for NSW	Pre-construction / Construction
AH2	Aboriginal heritage	In accordance with the sustainability requirements for the project, opportunities for implementation of Aboriginal heritage interpretation (such as interpretation signage) should be investigated during detailed design, and incorporated into the overall Heritage Interpretation Strategy for the project.	Contractor	Detailed design
AH3	Aboriginal heritage	The Roads and Maritime <i>Unexpected Heritage Items</i> (RMS, 2015) will be followed in the event that (an) unknown or potential Aboriginal object(s), including skeletal remains, is/are found during construction. This applies where Transport for NSW does not have approval to disturb the object(s) or where a specific safeguard for managing the disturbance (apart from the procedure) is not in	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		place. Work will only restart once the requirements of that procedure have been satisfied.		
T1	Transport, traffic, access	<p>A Traffic Management Plan (TMP) will be prepared and will include the following.</p> <ul style="list-style-type: none"> • Final access and parking arrangements • Alternate pedestrian and cyclist access around the construction area • Measures to ensure light vehicle parking is strictly in accordance with Mosman Council requirements and prevents parking on footpaths and grassed areas adjacent the site. 	Contractor	Pre-construction
T2	Transport, traffic, access	Where possible, the preferred means of transporting equipment and materials to the site will be via boat and barge over land transport so as to limit impacts to the local road network.	Contractor	Construction
T3	Transport, traffic, access	Public transport passengers will be notified of any impacts to transport services and the alternative transport arrangements prior to the commencement of construction. This will include updates to the timetable (online and Opal app) indicating the temporary closure of the South Mosman wharf.	Transport for NSW	Pre-construction / Construction
T4	Transport, traffic, access	<ul style="list-style-type: none"> • A maritime navigation exclusion zone will be established during construction to prevent unauthorised vessels entering the area. • This zone will be clearly defined to communicate access for other water users. 	Contractor	Pre-construction / Construction
T5	Transport, traffic, access	<p>A Maritime TMP will be prepared and implemented during the water based construction work. The Maritime TMP will be prepared in consultation with Transport for NSW and approved by the Harbourmaster. In addition, the project will:</p> <ul style="list-style-type: none"> • Fit all buoys with lights • Prepare Response Plans for emergencies and spills for all construction vessels • Fit at least one vessel with an Automatic Identification System (AIS) • Retrieve any material associated with the construction of the development that enters the water to prevent the obstruction of vessel movements 	Contractor	Pre-construction / Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Prepare a Communications Plan for implementation during the work which must include 24/7 contact details, protocols for enquiries, complaints and emergencies. <p>Any variation to the above will be agreed in advance with the Harbourmaster.</p>		
T6	Transport, traffic, access	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.	Transport for NSW	Pre-construction / Construction
<u>T7</u>	<u>Transport, traffic, access</u>	<u>Discussions will be held with the State Transit Authority to determine if bus services need to be increased and operating hours extended to cater for the potential increase in demand during the construction period.</u>	<u>Transport for NSW</u>	<u>Pre-construction</u>
SE1	Socio-economic	<p>A Communications and Stakeholder Engagement Plan will be developed prior to the commencement of construction and will be implemented during construction to provide timely and accurate information to stakeholders. It will include (as a minimum):</p> <ul style="list-style-type: none"> Mechanisms to provide details and timing of proposed activities to affected residents and local businesses, including changes to traffic, public transport services and access A contact name and telephone number for complaints. 	Transport for NSW	Pre-construction / Construction
SE2	Socio-economic	<ul style="list-style-type: none"> A webpage and free-call number will be established for enquiries regarding the proposal, and will remain active for the duration of construction. Contact details will be clearly displayed at the entrance to the site. All enquiries and complaints will be tracked through a tracking system, and acknowledged within 24 hours of being received. 	Contractor	Pre-construction / Construction
SE3	Socio-economic	Investigate opportunities to improve priorities group employment participation in line with Transport for NSW's Social Procurement Policy.	Contractor	Pre-construction / Construction
SE4	Socio-economic	Investigate opportunities to encourage the construction contractor to purchase goods and services locally.	Transport for NSW	Pre-construction / Construction
SE5	Socio-economic	Investigate opportunities to incorporate community health and well-being initiatives in the design and construction of the proposal.	Transport for NSW	Detailed design / Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
AQ1	Air quality	<p>Air quality during construction will be considered and addressed within the CEMP and will include methods to manage work during strong winds or other adverse weather conditions as required. As a minimum, the following measures will be included:</p> <ul style="list-style-type: none"> • Covering all loaded trucks and vessels • Machinery to be turned off rather than left to idle when 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 legislation • Maintenance of all plant and equipment to ensure good operating conditions and exhaust emissions comply with the <i>Protection of the Environment Operations Act 1997</i> • Maintaining the work site in a condition that minimises fugitive emissions such as minor dust <p>Appropriate sediment and erosion controls for any exposed earth or stockpiled waste.</p>	Contractor	Pre-construction / construction
AQ2	Air quality	<p>During construction, the construction contractor is to monitor performance of their non-road diesel plant and equipment against US EPA, EU or equivalent emissions standards using Transport for NSW <i>Air Emissions Workbook - DMS-FT-439</i>.</p>	Contractor	Construction
WM1	Waste management	<p>A Waste Management Plan (WMP) will be prepared in accordance with the WARR Act. A WMP is to be prepared as part of the CEMP and will include measures to minimise waste, outline methods of disposal, reuse and recycling and monitoring, as appropriate. This is to include the following:</p> <ul style="list-style-type: none"> • Appropriate measures to avoid and minimise waste associated with the proposal should be investigated and implemented where possible. • Waste management, littering and general tidiness will be monitored during routine site inspections. 	Contractor	Pre-construction / Construction
WM2	Waste management	<p>Recycled, durable, and low embodied energy products will be considered to reduce primary resource demand in instances where the materials are cost and</p>	Transport for NSW	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		performance competitive and comparable in environmental performance (e.g. where quality control specifications allow).		
WM3	Waste management	During construction, the construction contractor is to monitor waste and recycling quantities using Transport for NSW Waste Data Collection Workbook – DMS-FT-436 to support compulsory requirement 4 of the Transport for <i>NSW Sustainable Design Guidelines version 4.0</i> .	Contractor	Construction
HR1	Hazards and risk	Appropriate emergency equipment such as flotation devices and first aid kits will be kept within the construction area.	Contractor	Construction
HR2	Hazards and risk	Safe work method statements or similar will be implemented to manage health and safety risks for the works.	Contractor	Pre-construction / Construction
HR3	Hazards and risk	Weather forecasts will be monitored during construction. In the unlikely event of a major flood event or strong marine winds/waves, equipment and materials will be temporarily removed from the site, where possible.	Contractor	Construction
HR4	Hazards and risk	Further assessment of impacts to local utilities will be undertaken including on-site services locating.	Transport for NSW	Detailed design
HR5	Hazards and risk	Dial Before You Dig (DBYD) investigations will be carried out prior to undertaking any excavation or piling works to identify any additional cables not identified during design.	Contractor	Pre-construction
HR6	Hazards and risk	All utilities within and adjacent to the proposal footprint will be located prior to the start of the works.	Contractor	Pre-construction
CC1	Climate change	During detailed design undertake a compliant carbon footprinting exercise in accordance with the Transport for NSW <i>Carbon Estimate and Reporting Tool Manual</i> (TfNSW, 2019). The carbon footprint will be used to inform decision making in design and construction.	Contractor	Detailed design / Construction
CC2	Climate change	During detailed design undertake a compliant climate risk assessment in accordance with the Transport for <i>NSW Climate Risk Assessment Guidelines – DMS-SD-081</i> .	Contractor	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
CC3	Climate change	<p>The detailed design process will consider adaptation measures for climate change, including the following:</p> <ul style="list-style-type: none"> • Design of pontoons, waiting areas and gangways • Integrate coastal erosion control techniques around landside infrastructure • Drainage and storm water infrastructure • Specifications of materials in design • Weather protection features. 	Contractor	Detailed design
S1	Sustainability	<p>The Contractor shall propose a suitably qualified and experienced sustainability officer at a minimum 14 days prior to site establishment to be endorsed by Transport for NSW. The sustainability officer will be responsible for implementing the sustainability objectives for the Project. Details of the sustainability officer, including defined responsibilities, duration and resource allocation throughout the appointment are to be submitted to Transport for NSW prior to the preparation of the Sustainability Management Plan.</p>	Contractor	Detailed design
S2	Sustainability	<p>Prior to commencement of construction, a Sustainability Management Plan shall be endorsed by Transport for NSW. The Plan shall be provided at least 14 days prior to site establishment and include the following minimum components:</p> <ul style="list-style-type: none"> • A completed electronic checklist demonstrating compliance with Transport for NSW's <i>Sustainable Design Guidelines version 4.0</i> (7TP-ST-114) • The Contractors sustainability goals and targets, internal procedures, and implementation strategy. 	Contractor	Detailed design
S3	Sustainability	<p>The Contractor must comply with the Transport for NSW <i>Sustainable Design Guidelines version 4.0</i>.</p>	Transport for NSW / Contractor	Detailed design / Construction
C1	Cumulative impacts	<ul style="list-style-type: none"> • Consultation will include notification prior to the start of the works • Updates on any delays or changes to the construction period will also be communicated. 	Transport for NSW	Pre-construction / construction
<u>D1</u>	<u>Design</u>	<p><u>Investigate opportunities to refine the design while maintaining accessibility requirements, including:</u></p>	<u>Transport for NSW</u>	<u>Detailed design</u>

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • <u>Re-positioning the wharf structure further to the south and east and away from residential properties</u> • <u>Re-positioning the stairwell and lift</u> • <u>Considering the use of different materials on the pontoon, lift and stair structures (e.g. frosted glass)</u> • <u>Incorporating a green/living wall on the side of the lift</u> • <u>Reducing the height of the lift</u> • <u>Providing additional weather protection.</u> 		
<u>D2</u>	<u>Design</u>	<u>Following construction install a boundary fence between Transport for NSW land and 2 Musgrave Street Mosman in consultation with property owners.</u>	<u>Transport for NSW</u>	<u>Detailed design</u>

4.3 Licensing and approvals

A summary of the licences and approvals required for the proposal is provided in Table 5-2.

Table 4-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Fisheries Management Act 1994</i>	Permit (section 37) is required to relocate seahorses, if applicable	Prior to start of the activity.
<i>Roads Act 1993</i>	Consultation with Mosman Council is required for works on Musgrave Street.	Prior to start of the activity.
Ports and Maritime Administration Regulations 2012	Written permission from the Harbour Master is required to disturb sediment in Sydney Harbour.	Prior to start of the activity.
<i>Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</i>	An application is required to Ausgrid to upgrade the existing switchboard to accommodate the new wharf.	Prior to start of the activity.

5. References

DoE (2013) *Matters of National Environmental Significance. Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment.

RMS (2016) *Construction Noise and Vibration Guideline*. Roads and Maritime Services, August 2016.

TfNSW (2020) *South Mosman Wharf Upgrade. Review of Environmental Factors*. Prepared by Cardno (NSW/ACT) Pty Ltd on behalf of Transport for NSW, November 2020.

Appendix A

South Mosman Wharf Upgrade, Review of Environmental Factors,
November 2020

Appendix B

Significant impact assessment (EPBC Act)

Preamble

The Assessment of Significance (AoS) has been completed by Dilys Zhang (BSc Hons.), an ecologist for Cardno, for the White's Seahorse (*Hippocampus whitei*) listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) identified as having high potential to occur within the study area due to the presence of nearby records and the presence of suitable habitat (refer section 6.3 and Appendix D of the REF).

This AoS has been completed in accordance with the Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (Department of the Environment (DoE), 2013). Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts (DoE, 2013). Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50 per cent chance of happening. It is sufficient if a significant impact on the environment is a real or not remote chance or possibility (DoE, 2013).

White's Seahorse (*Hippocampus whitei*)

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:

(a) Lead to a long-term decrease in the size of population

White's Seahorse has limited geographical distribution in Australia and is endemic to nine estuaries, coastal lakes and embayments from Wallis Lake in the north to Lake Illawarra in the south, along approximately 300 kilometres of the NSW coast (Harasti, et al., 2014). White's Seahorse is known to occur at depths of between one and 15 metres and can be found in a wide range of habitat types (both natural and artificial). Natural habitat for White's Seahorse in estuaries includes marine vegetation (ie seagrass, macroalgae on rocky reef and mangroves) as well as sponges and corals (Australian Museum, 2020; Harasti, et al., 2014; Kuitert, 2009). In Sydney, they are often found associated with artificial structures, particularly protective swimming net enclosures and jetty pylons. Their use of artificial habitats appears to be most common in areas where natural habitat (such as seagrass, sponges and soft corals) has been lost (Fisheries Scientific Committee, 2019). The species is found to prefer habitats with dense epibiotic growth and avoids areas devoid of growth, possibly in relation to the greater availability of shelter and prey in these areas (Harasti, et al., 2010). Densities in artificial habitats such as swimming nets can be as much as one per square metre, but estimates in natural habitat have been around an order of magnitude less (Harasti, et al., 2012).

The study area is considered to provide suitable habitat for White's Seahorse in low to medium relief rocky reef (0.10 hectares) and existing piles and pontoon of which <0.01 hectares of rocky reef and 0.01 hectares of macroalgae on piles and the pontoon would be removed as a result of the proposal. The potential loss of individuals from the removal of this habitat could decrease the size of the local population, if individuals were to occur in the proposal area. However, in order to avoid loss of any individuals of this species, targeted surveys will be completed prior to the commencement of water-based construction activities to capture and relocate individuals in the study area (see Section 5 of the Biodiversity Assessment Report). With this measure, the proposal is unlikely to lead to the long-term decrease in the size of the local population of White's Seahorse.

(b) Reduce the area of occupancy of the species

As indicated in (a), White's Seahorse has potential to reside in subtidal rocky reef and artificial structures, which are both present in the study area. However, optimal habitat and known populations are found elsewhere in the harbour (eg Clifton Gardens). It is also likely that the frequent exposure to ferry and other vessel wash may render habitat in the study area suboptimal. The proposal would remove existing piles and the pontoon, considered suitable habitat for the species, with a total surface area of 0.01 ha. The proposal would also remove <0.01 hectares of subtidal rocky reef from the installation of new piles. These are considered small proportions of potential habitat for the species in the study area and the wider harbour and the new piles and pontoon to be installed would form potential habitat for the species once colonised.

by habitat-forming species. The surface area of the newly installed piles and pontoon would amount to twice that to be removed (about 0.02 hectares). Hence, although the proposal will remove an existing area of occupancy of the species, a greater area of replacement habitat would be reinstated. The proposal is unlikely to reduce the area of occupancy of the White's Seahorse.

(c) Fragment an existing population into two or more populations

As indicated in (a) and (b), the White's Seahorse habitat occurs in nearshore areas in the harbour. This species exhibits high site fidelity and does not have a pelagic juvenile stage. Young are known to either disperse short distances from or simply settle at the birth site. Although high abundances of this species have not been recorded in the study area, there are multiple known locations in the harbour where juveniles may disperse from. However, the proposal is not expected to install any structures or alter ferry operations such that potential dispersal corridors along the foreshore would become fragmented or isolated. Thus, the proposal is unlikely to fragment an existing population of White's Seahorse in the harbour into two or more populations.

(d) Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species refers to areas that are necessary for activities such as:

- (a) foraging, breeding, roosting, or dispersal
- (b) for the long-term maintenance of the species including the maintenance of other species essential to the survival of the species, such as pollinators
- (c) to maintain genetic diversity and long-term evolutionary development, or
- (d) for the reintroduction of populations or recovery of the species.

See (a) and (b). The proposal has potential to impact potential, sub-optimal habitat for the species. This sub-optimal habitat would be temporarily lost but then reinstated (twice the area than that lost). Thus, the proposal is unlikely to adversely affect habitat critical to the survival of the White's Seahorse.

(e) Disrupt the breeding cycle of a population

Research found that White's Seahorse displays life-long monogamy, with three pairs observed remaining bonded over three consecutive breeding years (Harasti, et al., 2012). Thus, the loss of any individuals would disrupt the breeding cycle of White's Seahorse. No individuals are expected to be lost as a result of the project (see (a)). Any individuals occurring within the study area would be relocated prior to construction by a qualified marine ecologist using researched methods to avoid disruption to their lifecycle. Habitat would be selected by a marine ecologist and individuals would only be relocated to nearby, like-for-like habitat (as per advice from DPI (Fisheries)). Hence, the proposal is unlikely to disrupt the breeding cycle of a population.

(f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

See (b) and (c). The proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the White's Seahorse is likely to decline.

(g) Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat

Use of equipment and movement of vessels and barges have potential to act as vectors for introduced species. However, there are no known invasive species that could be introduced that could directly cause White's Seahorse to decline. Invasive species that would alter White's Seahorse habitat could be introduced via the aforementioned vectors however, proposal controls would be in place to avoid introducing or spreading invasive species. Thus, the proposal is unlikely to introduce or spread invasive species that are harmful to White's Seahorse.

(h) Introduce disease that may cause the species to decline

As per (g).

(i) Interfere substantially with the recovery of the species

There is currently no recovery plan or recommendations for a recovery plan for the White's Seahorse. When this species was initially nominated for listing under the EPBC Act, the Fisheries Scientific Committee had recommended management actions for the White's Seahorse, including:

- Collate and synthesise data collected to quantify the significance of high and moderate risk threat interactions with *H. whitei* (medium priority)
- Reduce the impact of public and private boat moorings that impact on *H. whitei* habitats (high priority)
- Councils to maintain best practice management of protective swimming nets by using the suggested NSW DPI seahorse friendly cleaning methods (high Priority)
- Consider information on *H. whitei* distribution, abundance and habitat preferences during development and review of Marine Park Zoning Plans (medium priority)
- Negotiate with relevant authorities to encourage the identification, assessment and modification of natural resource management plans and policies to minimise impacts on *H. whitei* habitats (medium priority)
- Continue to monitor the distribution and abundance of *H. whitei* at important sites (Port Stephens and Sydney Harbour) to inform population status and to assist in determining the effectiveness of recovery actions (high priority)
- Develop and trial artificial habitats to promote recovery of *H. whitei* populations (high priority).
- Implement research using eDNA to investigate the occurrence of *H. whitei* in estuaries and embayments across its range (high priority)
- Implement genetics research to investigate population structure of *H. whitei* across its entire range (NSW and Qld) (medium priority)
- Encourage the reporting of sightings of seahorses along the east coast of Australia to iSeahorse and iNaturalist (medium priority).

The proposal would not interfere with any of the above recommendations. Targeted surveys during pre-construction to capture and relocate the species could be completed in consultation with NSW DPI (Fisheries) to align with some of the above management recommendations.

Conclusion

White's Seahorse is known to be present in Port Jackson. The study area possesses sub-optimal habitat for the species and it is not known to disperse (either as adults or juveniles) great distances from the birth sites. Potential habitat in the study area occurs as low to medium relief rocky reefs and the submerged sections of the existing artificial structures. The proposal would temporarily remove potential habitat for the species. However, lost potential habitat would be reinstated (twice the area than that lost). The proposal is unlikely to fragment the population of White's Seahorse in the harbour, disrupt the breeding cycle of the species, introduce or spread invasive species or disease that may adversely impact the species or interfere with any recovery objectives. Thus, the proposal is unlikely to significantly impact White's Seahorse and a referral is not required.

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