

Chandos Street Noise Wall Installation

Submission report

Roads and Maritime Services | April 2019



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Prepared by Arup and Roads and Maritime Services

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Approval and authorisation

Title	Chandos Street Noise Wall Installation Submissions Report
Accepted on behalf of NSW Roads and Maritime Services by:	Adam Price Project Manager
Signed:	
Dated:	

Executive summary

The proposal

Roads and Maritime Services (Roads and Maritime) proposes to install a noise wall along the western side of the Warringah Freeway between St. Thomas' Rest Park and Brook Lane (the proposal). The installation would provide both community benefit and reduce noise exposure at key affected properties.

The key features of the proposal include:

- Installing a 4.5-metre-high noise wall for about 180 metres on the western side of the Warringah Freeway between St. Thomas' Rest Park and an existing brick property boundary wall at the end of Jenkins Lane
- Installing a three-metre-high noise wall about 17 metres long out from the existing brick property boundary wall at the end of Jenkins Lane
- Relocating existing roadside infrastructure such as light poles and utilities
- Introducing landscape planting and urban design measures.

Construction of the proposal is expected to start in mid-2019 and site work is expected to last for about ten months.

Review of Environmental Factors display

The Review of Environmental Factors (REF) was placed on public display to seek feedback on the proposal from the community, government agencies and other stakeholders.

The REF was publicly displayed for 22 days between 23 November and 14 December 2018. The REF was available in hard copy at North Sydney Council, 200 Miller Street, Sydney and placed on the Roads and Maritime project website where it was made available for download. The display location and website link were announced by issuing a community update to residents, businesses and key community facilities locally.

A total of seven submissions were received in response to the display of the REF. This included one submission from North Sydney Council, and six submissions from individual community members.

This submissions report considers all submissions received during display of the REF.

Summary of submissions and responses

The main issues raised in submissions from community members were regarding the placement/location of the noise wall, the removal of existing vegetation at the end of Chandos Street, concern about construction noise of installing the noise wall and concern that the installation of the noise wall may promote anti-social behaviour in areas with poor lighting.

In addition to submissions raised from community members, North Sydney Council's submission provided support for the proposal and requested that the panel finish of the noise wall be a surface texture similar to that of the Sexton Place Noise Wall and that lighting be installed to the appropriate level in the local streets.

The main issues raised in submissions relating to the proposal are summarised under the following headings:

- Design extent
- Construction noise and operational noise reflection
- Vegetation
- Public land.

Design extent

Issue: Concern regarding the proposed location of the noise wall, with requests that an additional noise wall be constructed on the western side of the Warringah Freeway, between the freeway and the Brook Street off-ramp, and over Brook Street.

Response: While a noise wall on the western side of the Warringah Freeway, between the freeway and the Brook Street off-ramp is not part of this proposal, Roads and Maritime is separately completing further investigations to determine if a wall in this location is reasonable and feasible in accordance with Roads and Maritime's Noise Mitigation Guideline (NMG).

Issue: Concern that the noise wall will not have the height required to serve multi-storey residential dwellings, and suggestion that a consistent wall type to the existing brick property boundary wall at Jenkins Lane be used along the 17-metre-long wall near Brook Lane.

Response: The material of the noise wall has been selected for durability, weatherability and constructability, and therefore it is not proposed to change the wall type due to constructability constraints. It is instead proposed to colour match the wall to the existing brick property boundary wall to provide visual consistency. Where the proposal does not reduce noise levels to within the Noise Abatement Program criteria, at-property treatments would also be used. Roads and Maritime would engage with affected property owners to discuss options for at-property treatment where necessary.

Issue: Concern that the area at the end of Chandos Street will be accessed by unauthorised people without fencing being reinstated, posing a security threat to properties, and request that more lighting options be considered in this area to deter antisocial behaviour.

Response: Appropriate fencing would be reinstated at the end of Chandos Street upon completion of the proposal to prevent unauthorised access to private land. No lighting is required for the noise wall and therefore additional lighting is not proposed. A designated lit access path is provided approximately 50 metres south off Matthew Lane via other streets, therefore access to St. Thomas' Rest Park would not be restricted by the proposal where the public choose not to use the informal access path.

Construction noise and operational noise reflection

Issue: Request for information regarding noise mitigation strategies proposed for residents on the Cammeray side of the Warringah Freeway during construction and concern regarding the potential for operational noise to be reflected from the Chandos Street Noise Wall.

Response: The REF provides a number of noise mitigation strategies for each identified Noise Catchment Area (NCA). These include letterbox drop notifications, increasing nightworks to reduce the overall duration of the proposal (duration respite) and the potential arrangement of alternate accommodation for residents in NCA 1. Appropriate safeguards have also been identified to minimise noise impacts as far as practicable.

A noise wall reflection analysis has been completed that demonstrates there is no increase in operation noise on the Cammeray side of the freeway due to the construction of the Chandos Street Noise Wall.

Vegetation

Issue: Concern regarding the loss of vegetation required to facilitate construction of the noise wall and concern that the land at the end of Chandos Street and near the Brook Street off ramp will not be maintained to a sufficient standard.

Response: An arboricultural assessment was undertaken in developing the REF which identified the vegetation to be removed as part of the proposal. Replanting and landscaping would be undertaken in areas in which vegetation would be removed, outlined in the Landscape Plan in the REF. The length of the

noise wall near Brook Street was reduced slightly as part of the final design, maintaining five existing well-established trees including two high amenity value trees.

Public land

Issue: Sought clarification regarding the ownership of the land at the end of Chandos Street and concern that exclusive access to this land will be lost.

Response: Roads and Maritime have identified that the land at the end of Chandos Street falls under North Sydney Council ownership. It is proposed that this land would be returned to North Sydney Council to maintain at the completion of the proposal.

Changes to the REF proposal

Due to constructability issues, the alignment of the noise wall between the end of Chandos Street and Jenkins Lane has moved up to two metres closer to the Warringah Freeway. This design change would reduce overshadowing impacts marginally at properties on Chandos Street however there is the potential for minor changes to noise levels reported in the REF for properties closest to the noise wall. Following further consultation with North Sydney Council the Landscape Plan for the proposal has also been updated to include additional planting.

The design change has been described in chapter 3 of this submissions report.

Additional studies/assessment

Operational noise

An amendment to the noise and vibration assessment was prepared to reassess operational noise impacts of the proposal following changes to the design. The assessment specifically focused on the noise impacts associated with the realignment of the noise wall between Jenkins Lane and Matthew Lane.

The modelling shows that the results for operational noise impacts presented in the REF remain unchanged. The requirement for further at-property treatment to be considered at the 23 properties eligible under the Noise Abatement Program (NAP) identified in the REF would remain. Roads and Maritime would engage with affected property owners to discuss options for at-property treatment.

Biodiversity

An amendment to the arboricultural and biodiversity assessment was also prepared. This was carried out as a result of further site investigation which identified additional trees that could potentially be impacted by the proposal. Additional assessment identified a further 16 trees within the construction footprint which were all identified to be of low to medium retention value and varying levels of health and structure from good to poor.

The revised assessment shows that the proposal would result in the loss of localised vegetation (miscellaneous ecosystem) from the Warringah Freeway road margin and surrounding areas. This includes the loss of 39 (81 per cent) of the recorded trees (an additional 20 trees to those assessed in the REF).

There have been no changes to the proposal that are of a nature deemed so great as to result in a fundamentally different proposal to that displayed in the REF.

Contents

Executive summary	i
Contents	iv
1. Introduction and background	1
1.1 The proposal.....	1
1.2 REF display	4
1.3 Purpose of the report	4
2. Response to issues	5
2.1 Overview of issues raised	5
2.2 Submissions from North Sydney Council	6
2.3 Support for the proposal.....	6
2.4 Design extent.....	7
2.5 Construction noise and operational noise reflection	9
2.6 Vegetation.....	10
2.7 Public land	10
3. Changes to the proposal	12
3.1 Alignment of the noise wall between Jenkins Lane and Matthew Lane	12
3.2 Urban design	13
4. Environmental assessment	14
4.1 Operational noise.....	14
4.2 Biodiversity	14
5. Environmental management	21
5.1 Environmental management plans (or system)	21
5.2 Summary of safeguards and management measures	21
5.3 Licensing and approvals	38
6. References	39

Tables

Table 2-1: Respondents	5
Table 4-1: Additional environmental safeguards for biodiversity	20
Table 5-1: Summary of environmental safeguards and management measures.....	22
Table 5-2: Summary of licensing and approval required	38

Figures

Figure 1-1: Location of the proposal	2
Figure 1-2: Key features of the proposal.....	3
Figure 2-1: Ownership of land at the end of Chandos Street	11
Figure 3-1: Revised proposal.....	12
Figure 3-2: Landscape plan	13
Figure 4-1: Retention value of trees within the construction footprint	16
Figure 4-2: Trees to be removed	17
Figure 4-3: Trees to be removed at the end of Chandos Street	18
Figure 4-4: Trees to be removed at St. Thomas' Rest Park	19

Appendices

Appendix A	Community notification
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1. Introduction and background

1.1 The proposal

The Warringah Freeway is a three-kilometre section of road located on Sydney's lower north shore, linking the Sydney Harbour Tunnel with the Lane Cove Tunnel. The road is heavily trafficked and generates noise for nearby communities.

Residences located on Matthew Lane, Chandos Street, Jenkins Lane and part of Brook Street were identified as being affected by road traffic noise from the Warringah Freeway at levels above the NSW Noise Abatement Program (NAP) eligibility criteria.

The NAP is funded by the NSW Government and is delivered by Roads and Maritime Services (Roads and Maritime). Its purpose is to mitigate impacts for noise-sensitive land-uses that are exposed to high levels of road traffic noise from State and Commonwealth roads.

Roads and Maritime proposes to install a noise wall along the western side of the Warringah Freeway between St. Thomas' Rest Park and Brook Lane.

While providing a community benefit, the wall would also reduce noise exposure at key properties affected at levels that exceed criteria set under the NAP. These criteria define eligibility for the consideration of treatment measures where people are affected by existing road traffic noise levels.

The key features of the proposal include:

- Installing a 4.5-metre-high noise wall for about 180 metres on the western side of the Warringah Freeway between St. Thomas' Rest Park and an existing brick property boundary wall at the end of Jenkins Lane
- Installing a three-metre-high noise wall about 17 metres long out from the existing brick property boundary wall at the end of Jenkins Lane to Brook Lane
- Relocating existing roadside infrastructure such as light poles and utilities
- Introducing landscape planting and urban design measures.

The noise wall would be built from solid panels, except in one location where transparent panels would be used along the top two metres to reduce overshadowing. Each solid panel would be painted, and landscape planting would be provided in key locations to improve its urban design and visual setting.

The location of the proposal is shown in Figure 1-1 and the key features of the proposal is provided in Figure 1-2.

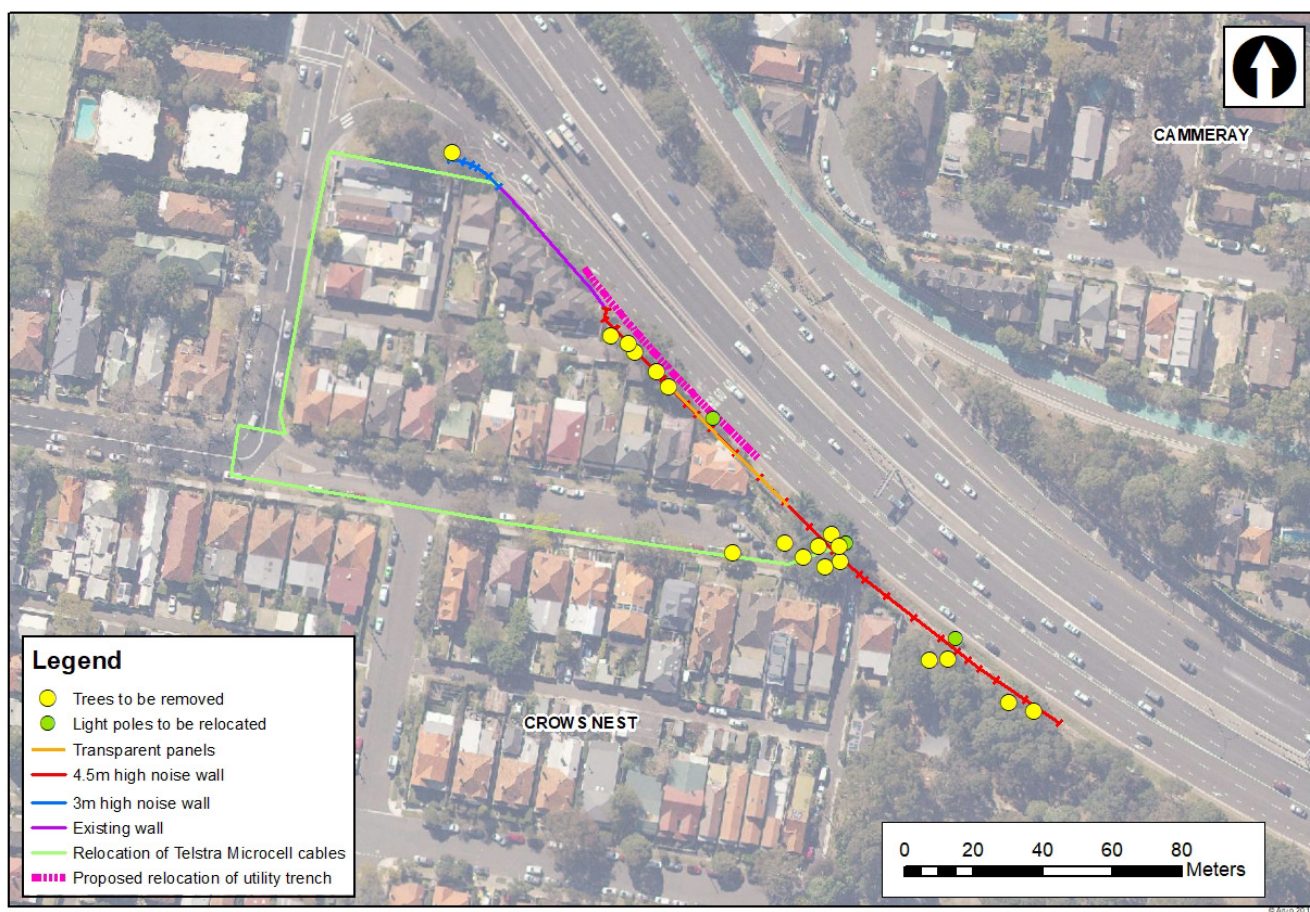
Construction of the proposal is expected to start in mid-2019 and site work is expected to last for about ten months.

A more detailed description of the Chandos Street Noise Wall Installation is found in the Chandos Street Noise Wall Installation Review of Environmental Factors (REF) prepared by Roads and Maritime in November 2018.



Source: Arup

Figure 1-1: Location of the proposal



Source: Arup

Figure 1-2: Key features of the proposal

1.2 REF display

Roads and Maritime prepared an REF to assess the potential environmental impacts of the proposed work. The REF was publicly displayed for 22 days between 23 November and 14 December 2018 at North Sydney Council, 200 Miller Street, Sydney. The REF was also placed on the Roads and Maritime website and made available for download. The display location and website link were announced by issuing a community update to residents, businesses and key community facilities locally. A community notification of the REF display and community feedback session (refer to Appendix A) was sent to residents, communicated by 29 letter box drops and 91 door knocks. The REF was also sent to North Sydney Council for comment as a key stakeholder for the proposal.

A community session was also held on 29 November 2018 at the Crows Nest Centre during display of the REF to discuss the outcomes of the REF and to give residents an opportunity to ask questions and provide feedback. Approximately 25 local residents attended the community session.

1.3 Purpose of the report

This submissions report relates to the REF prepared for the Chandos Street Noise Wall Installation 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 Roads and Maritime. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). It details changes to the proposal since finalisation of the REF (Chapter 3), describes and assesses the environmental impact of changes to the proposal (Chapter 4) and identifies new or revised safeguards and management measures (Chapter 5).

2. Response to issues

Roads and Maritime received seven submissions, accepted up until the 20 December 2018. 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 Chapter 2 of this report.

Table 2-1: Respondents

Respondent	Submission No.	Section number where issues are addressed
Individual submission	1	2.3, 2.4.1
Individual submission	2	2.3, 2.4.1
Individual submission	3	2.3, 2.4.3
Individual submission	4	2.5
Individual submission	5	2.3, 2.4.1, 2.4.2, 2.6
Individual submission	6	2.3, 2.4.1, 2.4.2, 2.4.3, 2.6, 2.7
Council submission	7	2.2, 2.3

2.1 Overview of issues raised

A total of seven submissions were received in response to the display of the REF. This included one submission from the North Sydney Council, and six submissions from individual community members.

Each submission has been examined individually to understand the issue(s) being raised. The issue(s) 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 Roads and Maritime response to these issues forms the basis of this chapter.

Five out of the seven submissions indicated conditional support for the proposal, one submission was in full support of the proposal and one submission did not offer a position of support nor objection.

The main issues raised in submissions from community members were:

- Concern regarding the placement/location of the noise wall
- Concern that the specified height and length of the noise wall is not sufficient enough
- Concern that the vegetation at the end of the Brook Street off ramp is poorly maintained
- Concern that the existing vegetation at the end of Chandos Street will be removed during construction while others are supportive of the new landscaping
- Concern that construction and operational noise affecting residents on the eastern side of the freeway has not been fully considered
- Concern that installation of the noise wall may create anti-social environments for pedestrians due to poor lighting.

No form letters were received as submissions.

2.2 Submissions from North Sydney Council

The North Sydney Council offered its support for the proposal however it identified the following items of concern (broadly aesthetics and lighting) for Roads and Maritime to consider:

- Request that the panel finish be a surface texture similar to that of the Sexton Place noise wall
- Request that lighting be installed to the appropriate level.

Response

Roads and Maritime thanks North Sydney Council for supporting the proposal.

During the concept design phase of the proposal, environmental, social and cultural issues were considered and used to inform the final design. This process assisted in reducing the potential environmental impact to the lowest possible extent. In developing the REF, Roads and Maritime undertook technical studies to inform the options assessment, detailed design and environmental management recommendations for the proposal.

The topography and site constraints for the Chandos Street noise wall are very different to the existing Sexton Place and Metcalf Street noise walls nearby. These both comprise solid panels with textured pattern. As the proposal is located on the northern boundary of properties on Chandos Street, a full height solid barrier is not appropriate at all locations as this would cast shadows on existing dwellings. The proposal includes transparent panels for the top two metres at those locations worst affected to minimise overshadowing impacts. Therefore, the Chandos Street Noise Wall would have a different aesthetic to the Sexton Place and Metcalfe Street noise walls.

As discussed in Appendix D in the REF, the material of the noise wall has been selected for durability, weatherability and constructability. The Chandos Street Noise Wall has minimal access at the top of the rock cutting for construction and a significant change in level over the length of the wall. A complex textured pattern on this slope is impractical for casting and successful installation on site. Based on these constraints, it was determined that a light weight panel with sections of transparent panels was the most appropriate option as assessed in the REF.

No lighting is required for the noise wall and none is proposed as part of this proposal.

Roads and Maritime has, and will continue to engage with North Sydney Council regarding the proposal and environmental management measures to be implemented, including future landscaping.

2.3 Support for the proposal

Submission number(s)

1, 2, 3, 5, 6, 7

Issue description

Numerous submissions stating support for the proposal were received. These ranged from comments stating full support, to comments stating support for the proposal with conditions, or comments supporting specific elements of the proposal and included:

- Support for all elements of the proposal in mitigating operational noise in the local area, including aesthetics and concept design (3)

- Support specifically for the installation of the noise wall to mitigate operational noise in the local area (1, 2, 3, 5, 6, 7)
- Support specifically for the removal and replacement of vegetation. (3)

Response

Roads and Maritime thank everyone for taking the time to consider the proposal and for their feedback and will continue to keep the community and stakeholders informed as the proposal progresses.

2.4 Design extent

2.4.1 Viaduct noise wall

Submission number(s)

1, 2, 5, 6

Issue description

Submissions were received regarding the proposed location of the noise wall and requesting that the noise wall be constructed on the western side of the Warringah Freeway, between the freeway and the Brook Street off-ramp including the Brook Street Overpass. (1, 2, 5)

Response

The proposal's objective was to respond to NAP exceedances at properties at the end of Chandos Street and was developed through an iterative design process taking into account constructability, environmental, social and cultural issues. While a noise wall on the western side of the Warringah Freeway, between the freeway and the Brook Street off-ramp is not part of this proposal, Roads and Maritime are completing further investigations to determine if a wall in this location is reasonable and feasible in accordance with Roads and Maritime's Noise Mitigation Guideline (NMG).

2.4.2 Wall height and type

Submission number(s)

5, 6

Issue description

Submissions were received requesting that the height of the noise wall be extended and that the type of the noise wall be reconsidered, including:

- Suggestion that the 17-metre-long wall near Brook Lane be of a similar wall type to the existing brick property boundary wall at Jenkins Lane (5)
- Concern that the noise barrier will not have the height required to serve multi-storey residential dwellings. (6)

Response

As discussed in Section 2.2, the material of the noise wall has been selected for durability, weatherability and constructability. While it is not proposed to change the wall type due to constructability constraints, it is proposed to colour match the 17-metre section of the wall to the existing brick property boundary wall to provide visual continuity. The height of this proposed section of the wall was also selected to match the height of the existing brick property boundary wall, maximising visual continuity.

Section 2.4.1 of the REF provides the method used to select the preferred noise wall height and extent. Roads and Maritime's NMG provides a process for determining the design barrier height. The height of the proposal also considers visual amenity and overshadowing impacts at locations next to the noise wall. The noise wall modelling shows the 4.5m high noise wall already provides a slight noise reduction for the first floor of the properties at the end of Chandos Street.

As stated in section 6.1.3 of the REF, where the proposal does not reduce noise levels to within the NAP criteria, at-property measures will also be used. Figure 6-6 of the REF shows those properties eligible for at-property treatment for ground and/or first floor. Roads and Maritime will engage with affected property owners to discuss options for at-property treatment measures where necessary.

2.4.3 Lighting and security

Submission number(s)

3, 6

Issue description

Concerns were raised regarding the safety and security of the proposal with regards to lighting and unauthorised access. These included:

- Concern that the area at the end of Chandos Street will be accessed by unauthorised people without fencing being reinstated, and that it should be similar to the current fencing for the landscaped area (3)
- Concern that removal of fencing at the end of Chandos Street poses a security threat to property (6)
- Request that more lighting options be considered near the noise wall to assist with pedestrian safety and to minimise the potential for anti-social behaviour post-construction. (3)

Response

Appropriate fencing would be reinstated at the end of Chandos Street on completion of the proposal. This would prevent unauthorised access to private property.

Section 6.5.3 of the REF considers local access in the vicinity of the noise wall, including informal access paths used by the community. The REF concluded that the installation of the noise wall would overshadow these areas and potentially make these less attractive options for the public.

The Chandos Street Noise Wall has been developed to reduce road traffic noise. Perceived security issues associated with the noise wall creating enclosed spaces were assessed in the REF. It was acknowledged that some informal access paths used by the community would be affected but that alternative lit routes exist via Atchison Street and Matthew Lane which would continue to provide appropriate levels of access into St Thomas' Rest Park. Therefore, there are no requirements to provide lighting as part of this proposal.

2.5 Construction noise and operational noise reflection

Submission number(s)

4

Issue description

One submission was received regarding the potential for noise impacts at the Cammeray side of the Warringah Freeway associated with the installation of the noise wall, specifically:

- Request for information regarding noise mitigation strategies during construction proposed for residents on the Cammeray side of the Warringah Freeway (4)
- Concern regarding the potential for operational noise to be reflected from the Chandos Street Noise Wall after completion of the project. (4)

Response

Appendix C of the REF includes a noise and vibration assessment for the installation of the Chandos Street Noise Wall that outlines proposed construction noise mitigation strategies based on the outcome of a construction noise assessment. Safeguards include management measures, source controls (e.g. construction hours and scheduling, equipment selection, plant noise levels, etc.) and path controls (e.g. shield stationary noise sources such as pumps, compressors, fans, etc. and shield sensitive receivers from noisy activities) aimed to minimise noise impacts as far as practicable.

Chapter 6 of the REF outlines the Noise Catchment Area (NCA) zoning and additional management measures for each NCA (refer to Table 6-7 of the REF). This includes letterbox drop notifications for all NCAs and increasing nightworks to shorten the overall construction programme (duration respite). Alternate accommodation may also be offered to residents in NCA 1 (the red area shown in Figures 6-2 to 6-5 of the REF) and would be reviewed after receiving a complaint. Additional noise mitigation measures are also specified for each of the assessed noise catchment areas, which include areas to the east of the Warringah Freeway. These safeguards would be included in the noise and vibration management plan.

Construction is anticipated to start mid 2019 (duration of about 10 months). Construction hours were adopted in accordance with Roads and Maritime's *Construction Noise and Vibration Guidelines* and are presented in Section 8.3, Appendix C of the REF. Roads and Maritime carried out consultation with the community in relation to construction hours via a 'Have your say' letter (refer to Appendix E of the REF) that was distributed to 4381 residents. The preferred option was identified to work up to 5 nights a week to reduce the overall duration of the proposal (duration respite).

Appendix C of the REF also includes a barrier reflection analysis which predicts noise levels at receivers of the Cammeray side of the Warringah Freeway after the Chandos Street Noise Wall has been completed. A maximum increase of 0.1 dB(A) is predicted for receivers on the opposite side of the Freeway. This small increase is not significant and would not be noticeable for residents of these properties.

2.6 Vegetation

Submission number(s)

5, 6

Issue description

Submissions were received regarding the proposed Landscaping Plan to be implemented to compensate for the loss of vegetation due to the proposal, including:

- Concern regarding the loss of vegetation required to facilitate construction (5, 6)
- View that the Roads and Maritime land at the end of the Brook Street off ramp between Brook Lane and Brook Street, Crows Nest is not maintained to a sufficient standard (5)
- Concern that the land at the end of Chandos Street will not be maintained. (6)

Response

In developing the REF, Roads and Maritime undertook technical studies to inform the options assessment, detailed design and environmental management recommendations for the proposal. Appendix F of the REF contains an arboricultural assessment which identified vegetation that requires removal as part of the proposal. Appendix D of the REF includes the urban design elements of the proposal such as replanting and landscaping of those areas where vegetation would be removed. Figure 3-4 of the REF shows the Landscape Plan for the proposal.

The land at the end of Chandos Street would be landscaped following installation of the noise wall and the maintenance strategy and landscaping would be developed in consultation with the council.

The installation of the 17-metre section of noise wall would remove existing vegetation in this area for construction purposes. However, the landscaping design proposes that two trees be planted in this area.

Any maintenance requirements of the noise wall post-construction would be passed on to the Roads and Maritime corridor asset team at the completion of construction.

2.7 Public land

Submission number(s)

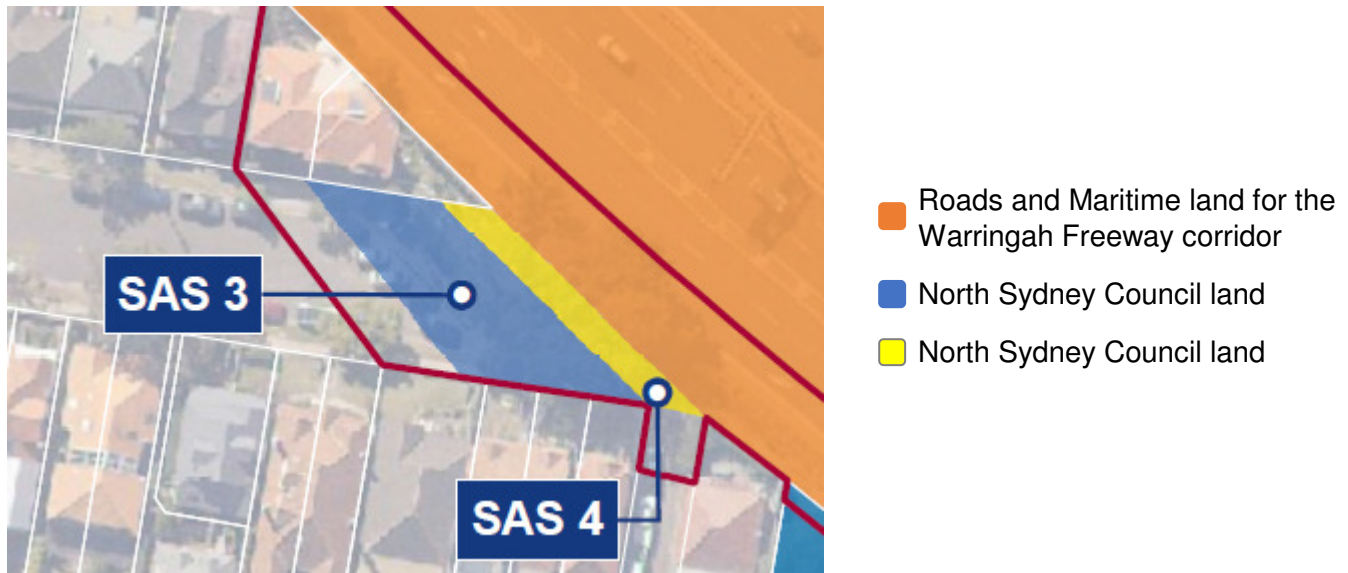
6

Issue description

One submission was received regarding the ownership of land at the end of Chandos Street and concern that exclusive access to the land at the end of Chandos Street will be lost. (6)

Response

Roads and Maritime have identified that the land at the end of Chandos Street falls under North Sydney Council ownership (see Figure 2-1)



Source: Roads and Maritime Services

Figure 2-1: Ownership of land at the end of Chandos Street

Fencing would be reinstated to prevent unauthorised access to North Sydney Council land at the end of Chandos Street. It is proposed that this land would be returned to North Sydney Council to maintain.

3. Changes to the proposal

3.1 Alignment of the noise wall between Jenkins Lane and Matthew Lane

3.1.1 Description

Due to constructability issues, the alignment of the noise wall between the end of Chandos Street and Jenkins Lane has moved up to two metres closer to the Warringah Freeway. The angle of the proposed alignment at the end of Jenkins Lane has also changed, improving the continuity aesthetic where the noise wall meets the existing brick property boundary wall. The revised alignment of the proposal is shown in Figure 3-1. This design change would reduce overshadowing impacts marginally at properties on Chandos Street however there is the potential for changes to noise levels reported in the REF for properties closest to the noise wall. The operational noise assessment has been updated and is discussed further in chapter 4.



Source: Arup

Figure 3-1: Revised proposal

3.2 Urban design

3.2.1 Description

Following further site investigation, an additional 16 trees were identified within the construction footprint with the potential to be impacted. The urban design strategy and landscape plan have therefore been revised to take account of further impacts and additional consultation carried out with North Sydney Council. Figure 3-2 shows the revised landscape plan for the project. It includes vegetation and tree preservation where feasible and reasonable, new groundcover planting and low-level tolerant dense native shrubs along the rear side of the noise wall to integrate it into the setting and context of the surrounding landscape and reduce its overall visually mass and scale.



Figure 3-2: Landscape plan

4. Environmental assessment

The noise and biodiversity assessments presented in the REF have been revised to account for the change in noise wall alignment and identification of additional trees within the construction footprint. The outcome of this further assessment is discussed below. For all other topics assessed in the REF, the change to the proposal does not fundamentally change the impacts assessed in the REF.

4.1 Operational noise

4.1.1 Methodology

The methodology and criteria for the assessment of noise impacts associated with the proposal remains as set out in the REF (see sections 6.1.1 and 6.1.3). The modelling has considered changes to the design alignment between Jenkins Lane and Matthew Lane.

4.1.2 Description of existing environment

The existing noise environment remains as set out in the REF (see section 6.1.2) and is characterised mainly by road traffic noise. The sensitive receivers near to the proposal remain as set out in section 6.1.2 of the REF.

4.1.3 Potential impacts

The modelling shows that the results for operational noise impacts presented in the REF remain unchanged. The requirement for further at-property treatment to be considered at the 23 properties eligible under the NAP (identified in Figure 6-6 of the REF) would remain. Roads and Maritime would engage with affected property owners to discuss options for at-property treatment measures during the detailed design process.

4.1.4 Revised safeguards and management measures

No additional safeguards or management measures to those outlined in the REF are required. A summary of the measures for noise and vibration is provided in Table 5-1.

4.2 Biodiversity

The assessment carried out as part of the biodiversity section of the REF (section 6.4 of the REF) has been updated to reflect the additional trees identified within the construction footprint which have the potential to be impacted.

4.2.1 Methodology

The methodology and criteria for the assessment of biodiversity impacts associated with the proposal remains as set out in the REF (section 6.4.1).

It should be noted that the accuracy of tree locations shown in Figure 4-1 is within three to five metres due to the tolerance of the GPS equipment used.

4.2.2 Description of existing environment

The existing biodiversity environment remains as set out in the REF (see section 6.4.2), however upon further site investigation, an additional 16 trees have been identified within the construction footprint which require assessment. As detailed in the REF, the existing environment, including the additional trees, comprises various mixes of native and exotic species introduced to provide amenity value within St. Thomas' Rest Park and the urban environment of Crows Nest.

Trees within the vicinity of the construction footprint include:

- One willow bottle brush *Callistemon salignus*
- Three Sydney blue gum *Eucalyptus saligna*
- One wattle *Acacia* sp.
- Two nettle tree *Celtis sinensis*
- One European nettle tree *Celtis australis*
- 12 black she-oaks *Allocasuarina littoralis*
- Two she-oaks *Casuarina cunninghamiana*
- Three Chinese banyan *Ficus macrocarpa*
- Five grey gums *Eucalyptus Punctata*
- 12 tallowwood *Eucalyptus microcorys*
- One eucalyptus gum tree *Eucalyptus* sp.
- Four spotted gum *Corymbia maculata*
- One jacaranda *Jacaranda mimosifolia*.

The majority of trees were assessed to be in fair to good health and condition, however five trees were identified to be in poor health, these are spread across the construction footprint at the end of Jenkins Lane, Chandos Street and the western section of St. Thomas' Rest Park. Two trees were identified as being of high retention value for amenity purposes, as shown in Figure 4-1, with the remaining trees of either medium to low retention value. None are protected under the BC Act or EPBC Act. It is likely that all these trees were planted when the Warringah Freeway was built to form part of the roadside amenity planting. While none of the trees hold specific floral or biodiversity value, four species (Sydney blue gum, grey gums, tallowwood, and spotted gum) can potentially contain tree hollows that provide habitat for birds and bats. All trees provide limited ecological or habitat value other than to hardy and tolerant endemic species as outlined in section 6.4.2 of the REF.



Source: Arup

Figure 4-1: Retention value of trees within the construction footprint

4.2.3 Potential impacts

Construction

Vegetation loss

The revised assessment shows that the proposal would result in the loss of localised vegetation (miscellaneous ecosystem) from the Warringah Freeway road margin and surrounding areas. This includes the loss of 39 (81 per cent) of the recorded trees (an additional 20 trees to those assessed in the REF). Some of these trees have been assessed, as a worst case, as needing removal however those close to the construction footprint may be able to be retained through on-site assessment and management techniques.

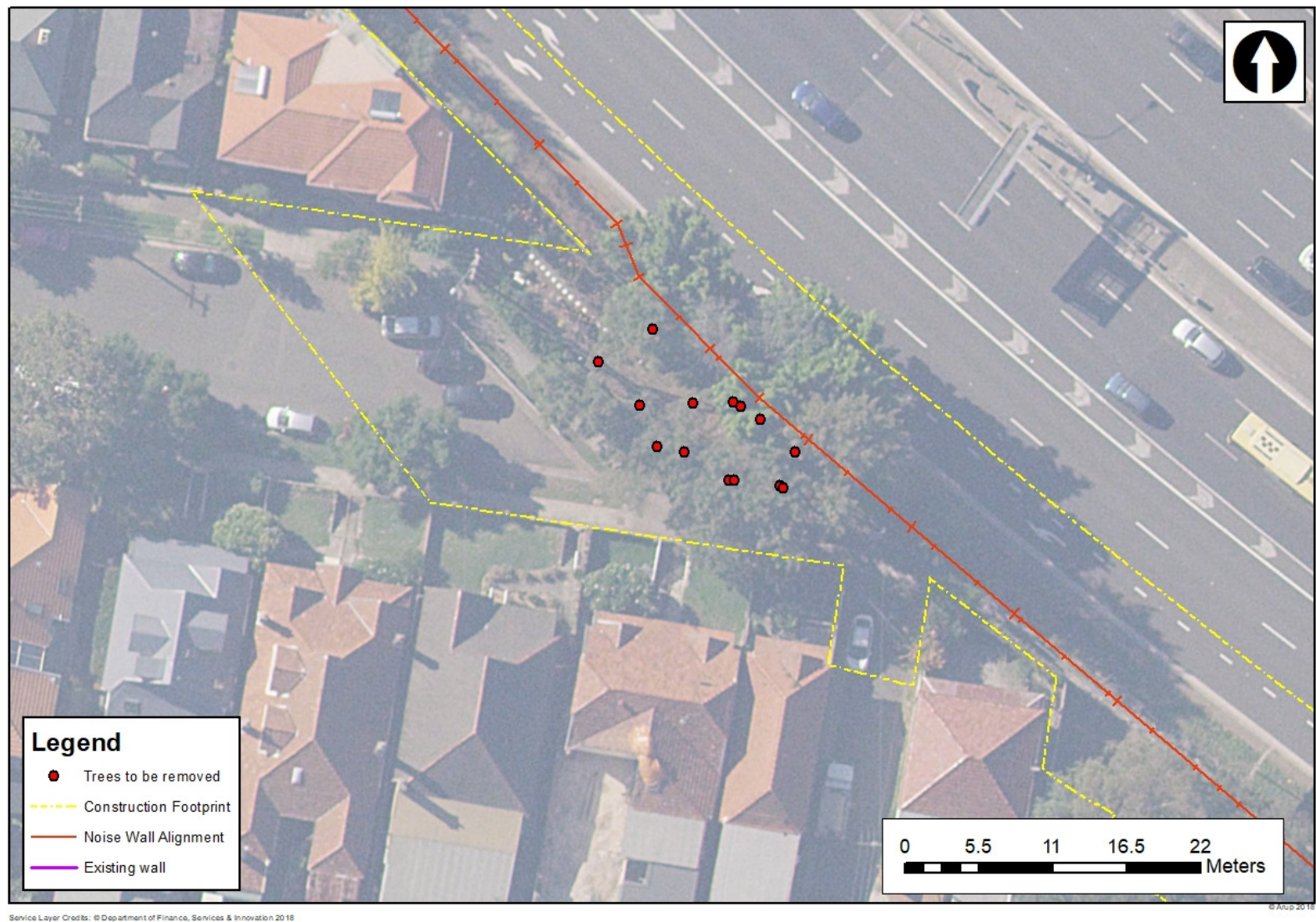
Tree value loss

All trees to be removed (shown in Figure 4-2) to deliver the proposal are identified as having a low-to-medium amenity value. As such, the arboricultural and amenity impact of their loss is limited and could be easily mitigated through replanting. Two trees at the Brook Street junction were identified as being of high amenity value and will not be impacted by the proposal. Figure 4-3 and Figure 4-4 show those trees assessed as needing removal at the end of Chandos Street and in St. Thomas' Rest Park, these are the locations where the majority of vegetation will be lost.



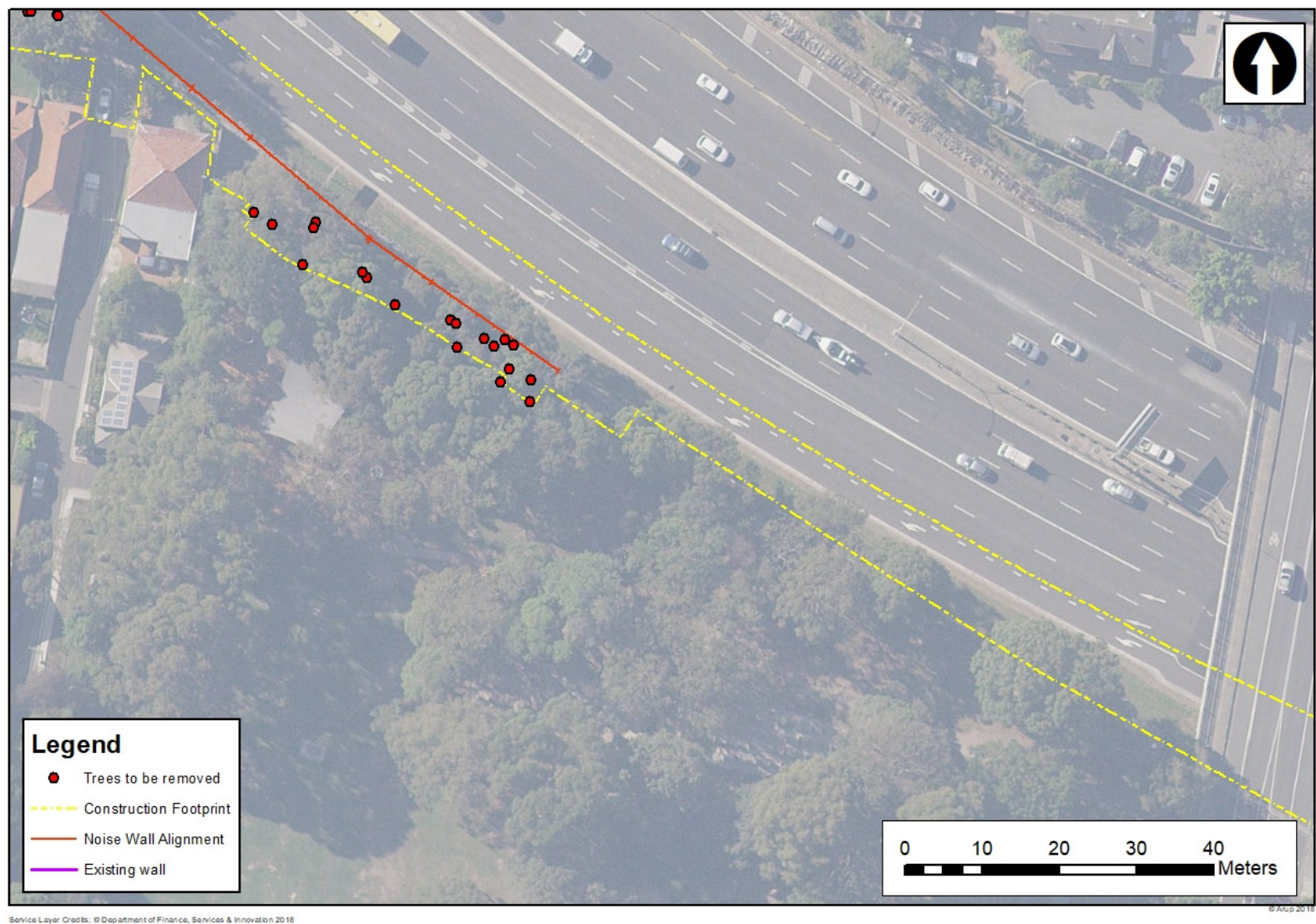
Source: Arup

Figure 4-2: Trees to be removed



Source: Arup

Figure 4-3: Trees to be removed at the end of Chandos Street



Source: Arup

Figure 4-4: Trees to be removed at St. Thomas' Rest Park

Key threatening processes and other impacts

The key threatening processes and other impacts associated with the proposal remains as set out in the REF (section 6.4.3).

Operation

The potential operational impacts associated with the proposal remains as set out in the REF (section 6.4.3).

Conclusion on significance of impacts

While more trees are likely to be impacted, the potential impacts associated with the proposal remains as set out in the REF (section 6.4.3) in that all trees to be removed are of low to medium amenity value.

4.2.4 Revised safeguards and management measures

Due to the accuracy of the survey information, an additional safeguard has been included to undertake further on-site assessment for the potential to retain those trees identified as having a medium impact in this assessment as shown in Table 4-1. A summary of all measures for biodiversity is provided in Table 5-1.

Table 4-1: Additional environmental safeguards for biodiversity

Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
Tree loss	Where trees close to the construction footprint have been identified for removal, an assessment of the potential for these trees to remain viable should be carried out on-site during construction.	Contractor	Construction	B8

5. Environmental management

The REF for the Chandos Street Noise Wall Installation identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Chapter 7 of the REF).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures included in the REF remain valid and no additional safeguards are required.

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

5.1 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 the Roads and Maritime Environment Officer/staff, 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 CEMP would be developed in accordance with the specifications set out in the: QA Specification G36 – Environmental Protection (Management System), QA Specification G40 – Clearing and Grubbing, QA Specification G10 – Traffic Management, QA Specification R178 – Vegetation, QA Specification R179 – Landscaping Planting, and QA Specification R271 – Design and Construction of Noise Walls.

5.2 Summary of safeguards and management measures

The REF for the Chandos Street Noise Wall Installation identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

Should the proposal proceed, the environmental management measures in Table 5-1 will guide the subsequent phases of the proposal. Additional safeguards not identified as part of the REF are shown as underlined font.

Table 5-1: Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Roads and Maritime 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. The endorsed CEMP will be implemented during the undertaking of the activity. 	Contractor / Roads and Maritime project manager	Pre-construction / detailed design	-
GEN2	General - notification	<ul style="list-style-type: none"> 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 / Roads and Maritime project manager	Pre-construction	-
GEN3	General – environmental awareness	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	Contractor	Pre-construction / detailed design	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<p>induction and regular "toolbox" style briefings.</p> <ul style="list-style-type: none"> Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include adjoining residential areas requiring particular noise and vibration management measures. 			
Noise and vibration					
NV1	Noise and vibration	<p>A Noise and Vibration Management Plan (NVMP) would be prepared and implemented as part of the CEMP. The NVMP would generally follow the approach in the Interim Construction Noise Guideline (ICNG, DECC, 2009) and identify:</p> <ul style="list-style-type: none"> All potential significant noise and vibration generating activities associated with the activity Feasible and reasonable mitigation measures to be implemented A monitoring program to assess performance against relevant noise and vibration criteria Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. 	Contractor	Detailed design/pre-construction	Section 4.6 of QA G36 <i>Environment Protection</i>
NV2	Noise	<p>Where reasonable and feasible, work would be carried out during standard work hours:</p> <ul style="list-style-type: none"> 7am to 6pm Monday to Friday 8am to 1pm Saturdays No construction on Sundays or Public Holidays. 	Contractor	Detailed design/pre-construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<p>To minimise disruption to traffic and potential safety risks to construction personnel and road users it would be necessary to carry out some work outside these daytime hours. Proposed night work construction hours would be:</p> <ul style="list-style-type: none"> 8pm to 5am Sunday to Friday 			
NV3	Noise	<ul style="list-style-type: none"> Any variations to the standard construction hours would follow the approach in CNVG including consultation with the affected local community. 	Contractor	Pre-construction/ construction	-
NV4	Noise	<p>All sensitive receivers likely to be affected would be notified at least five days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification would provide details of:</p> <ul style="list-style-type: none"> The proposal The construction period and construction hours Contact information for project community staff Complaint and incident reporting How to obtain further information. 	Contractor	Pre-construction	-
NV5	Noise and vibration	<ul style="list-style-type: none"> All personnel working on site would receive training to ensure awareness of requirements of the NVMP. Site-specific training will be given to personnel when working near sensitive receivers. 	Contractor	Pre-construction	-
NV6	Vibration	<ul style="list-style-type: none"> Attended vibration monitoring or vibration trials would be carried out when the proposed work is within safe work distances to ensure that the levels remain below corresponding criteria. 	Contractor	Pre-construction/ construction	-
NV7	Vibration	<ul style="list-style-type: none"> Building condition surveys would be carried out before 	Contractor	Pre-construction/	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		starting the work. The exact buildings to be surveyed would be identified once detailed construction planning has occurred and during the preparation of the NVMP.		construction	
NV8	Noise	<p>The following controls would be included in the NVMP:</p> <ul style="list-style-type: none"> • Where practical, the layout and positioning of noise-producing plant and activities at each work site would be optimised to minimise noise emission levels • Where practical, equipment would be selected to minimise noise emissions. Equipment would be fitted with appropriate noise control equipment and be in good working order. • Where possible, non-beeper reversing movement alarms would be used such as broadband (non-tonal) alarms or ambient noise-sensing alarms. Work sites would also be designed to reduce the need for reversing, potentially minimising the use of reversing beepers. • Vehicles, plant and equipment would be regularly inspected and maintained to avoid increased noise levels from rattling hatches, loose fittings etc • All vehicles, plant and equipment would be shut off when not in use. • Resilient damping material would be fitted on bin trucks to minimise noise impacts from loading materials. • Where feasible and reasonable, localised temporary acoustic hoardings/screens would be installed near high noise-generating activities. Hoardings/screens would be located as close to the noise source as possible, and would be an appropriate height as structurally feasible to minimise noise emissions 	Contractor	Construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NV9	Noise	<ul style="list-style-type: none"> Consistent with any specific requirements of the approved NVMP a noise monitoring program would be implemented during construction to assess effective implementation of noise and vibration safeguards, identify any unexpected or inadvertent impacts, and identify recommended revisions or improvements. 	Contractor	Construction	-
NV10	Noise	<ul style="list-style-type: none"> After considering the outcomes and recommendations arising from the noise monitoring program, and any other relevant information that becomes available during construction, appropriate measures would be implemented to address identified deficiencies or undertake actions needed to address noise and vibration impacts. If necessary, the NVMP would be reviewed and updated to include any additional measures. 	Contractor	Construction	-
NV11	Vibration	<ul style="list-style-type: none"> The required locations for using vibration generating equipment would be reviewed during construction planning when more-specific information is available. 	Contractor	Construction	-

Landscape character and visual amenity

LV1	Landscape character and visual impact	<p>An Urban Design Plan (UDP) would be prepared to support the final detailed project design and implemented as part of the CEMP. The UDP would present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan would include design treatments for:</p> <ul style="list-style-type: none"> Location and identification of existing vegetation and proposed landscaped areas, including species to be used 	Roads and Maritime project manager / Contractor	Detailed design/ pre-construction	-
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No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> Relocated and introduced fixtures such as lighting, fencing and signs Details of the staging of landscape work taking account of related environmental controls such as erosion and sedimentation controls and drainage Procedures for monitoring and maintaining landscaped or rehabilitated areas. <p>The UDP would be prepared in accordance with relevant guidelines, including:</p> <ul style="list-style-type: none"> Noise Wall Design Guidelines (RTA, 2006) Landscape Guideline (RTA, 2008) Beyond the Pavement (Roads and Maritime, 2014). 			
LV2	Landscape character and visual impact	<p>The CEMP shall include measures and procedures to minimise visual impacts, including:</p> <ul style="list-style-type: none"> The worksite is to be kept clean and tidy at all times Appropriate storage of equipment, arrangements for the storage and removal of rubbish and waste material On completion of work, all vehicles, material and refuse relating to the work would be removed 	Contractor	Pre-construction	-
LV3	Landscape character and visual impact	<ul style="list-style-type: none"> Detailed design solutions to minimise the visual impacts of noise wall would be developed in consultation with property owners, residents and North Sydney Council. 	Roads and Maritime project manager	Detailed design	-
LV4	Landscape character and visual impact	<ul style="list-style-type: none"> The Landscape Management Plan would be refined to ensure cost effective and consistent management of landscape works will be developed in consultation with property owners and residents. The plan will be prepared in accordance with the Landscape Guideline. 	Roads and Maritime project manager	Detailed design	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
LV5	Landscape character and visual impact	<ul style="list-style-type: none"> Landscaping is to be completed in accordance with the Landscaping and Urban Design Plan 	Contractor	Construction	-
LV6	Lighting impacts	<ul style="list-style-type: none"> Temporary site lighting will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting. 	Contractor	Pre-construction/ construction	
Non-Aboriginal heritage					
NAH1	Non-Aboriginal heritage	<ul style="list-style-type: none"> The Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime, 2015) would be followed if any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered. Work would only recommence once the requirements of that procedure have been satisfied. 	Contractor	Detailed design/ pre-construction	Section 4.10 of QA <i>G36 Environment Protection</i>
NAH2	Conservation Area	<ul style="list-style-type: none"> The at-property treatment measures would be designed to be consistent with the specific development control objectives for Conservation Area outlined in the North Sydney Council LEP. 	Roads and Maritime project manager	Detailed design	-
NAH3	Conservation Area	<ul style="list-style-type: none"> The UDP and LMP would be developed to minimise the visual impact of the inside of the noise wall along the common boundary of the Holtermann Estate Conservation Area and the St. Thomas' Rest Park. 	Roads and Maritime project manager	Detailed design	-
NAH4	St. Thomas' Rest Park	<ul style="list-style-type: none"> The tracking of vehicles would be carefully monitored to avoid any structural collision to the form and fabric of Sexton's Cottage, the gravestones and the cemetery fence Vehicle access in St. Thomas' Rest Park would follow the route shown in Figure 3-5 of the REF and a spotter 	Contractor	Pre-Construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<p>would be used to monitor progress.</p> <ul style="list-style-type: none"> This indicative access route would be confirmed and refined (where required) onsite before moving equipment through the park to avoid any impact on the form and fabric of the heritage value. 			
NAH5	St. Thomas' Rest Park	<ul style="list-style-type: none"> Before tracking vehicles and equipment through St. Thomas' Rest Park, heavy duty track mats would be laid down along the access path. 	Contractor	Construction	-
Biodiversity					
B1	Biodiversity	<p>A Flora and Fauna Management Plan (FFMP) would be prepared in accordance with Roads and Maritime's Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas Requirements set out in the Landscape Guideline (RTA, 2008) Pre-clearing survey requirements Procedures for unexpected threatened species finds and fauna handling Protocols to manage weeds and pathogens. 	Contractor	Detailed design/ pre-construction	Section 4.8 of QA G36 <i>Environment Protection</i>
B2	Biodiversity	<ul style="list-style-type: none"> All personnel working on site would receive training to ensure awareness of the requirements of the FFMP and relevant statutory responsibilities. Site-specific training would be given to personnel when working near areas of 	Contractor	Pre-construction/ construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		identified biodiversity value that are to be protected.			
B3	Tree loss	<ul style="list-style-type: none"> An arborist would carry out a pre-construction check of the site to confirm that all preserved trees are clearly and effectively marked and suitable protection zones are in place to prevent any impact on the canopy or root zones. 	Contractor	Pre-construction/ construction	-
B4	Hollow-bearing trees	<ul style="list-style-type: none"> Pre-clearance checks would be carried out for those tree species identified as potentially hollow-bearing that would be removed as part of the proposal to ensure these are not being used as habitat for bats and birds. If bat and bird species are discovered then they would be relocated in accordance with Guide 9: fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Roads and Traffic Authority, 2011). If needed nest boxes would be installed to replace the lost tree hollows as per Guide 8 of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Roads and Traffic Authority, 2011). 	Contractor	Pre-construction/ construction	-
B5	Tree loss	<ul style="list-style-type: none"> Tree removal or pruning would be carried out by a qualified specialist in accordance with AS4970: 2009: Protection of Trees on Development Sites (Standards Australia, 2009) and AS4373:2007: Pruning of Amenity Trees and WorkCover Amenity Tree Industry Code of Practice 1998. 	Contractor	Construction	-
B6	Biodiversity	<ul style="list-style-type: none"> Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved FFMP, an unexpected finds procedure would be implemented if a threatened species or ecological community that had not 	Contractor	Construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		been identified and assessed by the REF are unexpectedly encountered during the construction process.			
B7	Weeds and pathogens	<p>Declared noxious weeds and potential pests and pathogens would be managed according to requirements under the <i>Biosecurity Act 2015</i> and Guide 6 (Weed Management) of the Roads and Maritime Services Biodiversity Guidelines 2011 and Guide 7: pathogen management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Roads and Traffic Authority, 2011). Topsoil from the site that contains or potentially contains weed species or propagules would:</p> <ul style="list-style-type: none"> • Not be reused for future rehabilitation or revegetation works • Be removed from the construction site and disposed of at an appropriately licensed facility. • Until removal occurs, topsoil would be stockpiled in cleared or disturbed areas and managed in accordance with the RTA Stockpile Site Management Guideline. 	Contractor	Construction	-
<u>B8</u>	<u>Tree loss</u>	<u>Where trees close to the construction footprint have been identified for removal, an assessment of the potential for these trees to remain viable should be carried out on-site during construction.</u>	<u>Contractor</u>	<u>Construction</u>	<u>B8</u>
Traffic and transport					
TT1	Traffic and Access	A Traffic Management Plan (TMP) would be prepared and implemented as part of the CEMP. The TMP would be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA	Contractor	Detailed design/ pre-construction	Section 4.8 of QA <i>G36 Environment Protection</i>

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<p>Specification G10 Control of Traffic (RTA, 2008). The TMP would include:</p> <ul style="list-style-type: none"> • Confirmed haulage routes • Confirmed temporary traffic management provisions • Measures to maintain access to local roads and properties • Site-specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms • Work zones required in Chandos Street and Jenkins Lane • Stipulated parking restrictions. 			
TT2	Traffic and transport	<ul style="list-style-type: none"> • Consultation would be carried out with potentially affected residences before starting and during work in accordance with the Community Involvement and Communications Resource Manual (RTA, 2008). Consultation would include but not limited to door 	Roads and Maritime project manager	Detailed design/pre-construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		knocks, newsletters or letter box drops providing information on the proposed work, the need to park on local roads, working hours and a contact name and number for more information or to register complaints.			
TT3	Access	<ul style="list-style-type: none"> Requirements for any changes to local access arrangements would be confirmed during detailed design in consultation with the local road authority and any affected landowners. 	Roads and Maritime project manager	Detailed design	-
TT4	Access	<ul style="list-style-type: none"> Disruptions to property access and traffic would be notified to landowners at least five days in accordance with the relevant community consultation processes outlined in the TMP. 	Contractor	Construction	-
TT5	Pedestrian and cyclists	<ul style="list-style-type: none"> Pedestrian and cyclist access would be maintained throughout construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the local road authority. 	Contractor	Construction	-
Socio-economic					
SE1	Socio-economic	<ul style="list-style-type: none"> The community would be kept informed about the proposal through the measures outlined in the Communications Strategy for the proposal (as discussed in chapter 5 of the REF). 	Project Manager and consultation team	Pre-construction/ construction	-
SE2	Socio-economic	<ul style="list-style-type: none"> All acquisition of private property would be carried out in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and the Land Acquisition Information Guide (Roads and Maritime, 2014). 	Project Manager	Pre-construction/ construction	-
SE3	Socio-	<ul style="list-style-type: none"> Acquisition of a small parcel of land at the end of 	Project Manager	Pre-construction/	

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
	economic	Chandos Street owned by North Sydney Council would be made under powers afforded to Roads and Maritime under the <i>Roads Act 1993</i> following the processes in the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .		construction	
SE4	Socio-economic	<ul style="list-style-type: none"> Roads and Maritime would enter into an agreement with North Sydney Council to facilitate construction of the noise wall footing in the corner of the St Thomas' Rest Park, adjacent to Matthew Lane. On completion of the work, the park would be reinstated to the boundary of the lot, and landscaping would be agreed with North Sydney Council. 	Project Manager	Pre-construction/ construction	
Other impacts					
AQ1	Air quality	<p>The Construction Environmental Management Plan (CEMP) would include measures and procedures to minimise air pollution and odours, including:</p> <ul style="list-style-type: none"> Care during loading and unloading of materials to avoid spills and windblown dust Turn off machinery rather than left to idle when they are not in use Maintain vehicles to manufacturer's standards Employ measures such as watering or covering exposed areas to minimise or prevent air pollution and dust Vehicles transporting waste or other materials are to be covered during transportation. Ensuring sewer diversion is a closed system and back up pumps are available 	Contractor	Pre-construction	-
GH1	Greenhouse gas and	Specific measures would be outlined in the CEMP to ensure that construction minimises any potential impacts on or from	Contractor	Pre-construction/ construction	-

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
	climate change	<p>climate change including:</p> <ul style="list-style-type: none"> • Energy efficiency and related carbon emissions would be considered during the development of construction methodologies, procurement of low carbon alternatives and the selection of efficient plant vehicles, and equipment. • Plant, vehicles and machinery must be operated efficiently in accordance with the manufacturers guidelines to ensure optimal performance and be switched off when not in use. • Procedures would be set out for the management of extreme events including flooding, heatwaves and bushfires. 			
AH1	Aboriginal Heritage	<ul style="list-style-type: none"> • The Standard Management Procedure - Unexpected Heritage Items will be followed if a known or potential Aboriginal object(s), including skeletal remains, is found during construction. This applies where Roads and Maritime 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 place. Work would only recommence once the requirements of that Procedure have been satisfied. 	Contractor	Construction	-
SW1	Soil and water	<ul style="list-style-type: none"> • A Soil and Water Management Plan (SWMP) would be prepared and implemented as part of the CEMP. The SWMP would identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks would be addressed during construction. 	Contractor	Detailed design/pre-construction	Section 2.1 of QA G38 Soil and Water Management
SW2	Soil and water	<ul style="list-style-type: none"> • A site-specific Erosion and Sediment Control Plan (ESCP) would be prepared and implemented as part of 	Contractor	Detailed design/pre-construction	Section 2.2 of QA G38 Soil and Water

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		the SWMP. The Plan would include arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.			Management
SW3	Contaminated land	<p>If contaminated areas are encountered during construction, appropriate control measures would be implemented to manage the immediate risks of contamination. This may include but not be limited to:</p> <ul style="list-style-type: none"> • Diversion of surface runoff • Capture of any contaminated runoff • Temporary capping. • all other works that may impact on the contaminated area would 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 Roads and Maritime Environment Manager and/or EPA. 	Contractor	Detailed design/pre-construction	Section 4.2 of QA G36 Environment Protection
SW4	Soil and water	<ul style="list-style-type: none"> • A Spill Management Plan will be prepared and implemented as part of the CEMP to minimise the risk of pollution arising from spillage or contamination on the site and adjoining areas. The Spill Management Plan will address, but not necessarily be limited to: management of chemicals and potentially polluting materials; any bunding requirements; maintenance of plant and equipment; and emergency management, including notification, response and clean-up procedures. 	Contractor	Pre-construction/construction	-
W1	Waste	The CEMP will include specific guidance on measures and controls to be implemented to support minimising the amount	Contractor	Pre-construction	Section 4.2 of QA G36 Environment

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		<p>of waste produced and appropriate handle and dispose of unavoidable waste. This will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> Measures to avoid and minimise waste associated with the project Classification of wastes and management options (re-use, recycle, stockpile, disposal) Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions Procedures for storage, transport and disposal Monitoring, record keeping and reporting. <p>The measures will be prepared taking in to account <i>Environmental Procedure – Management of Wastes on Roads and Maritime Services Land</i> and relevant <i>Roads and Maritime Waste Fact Sheets</i>.</p>			<i>Protection</i>
Cumulative impacts					
CI1	Cumulative impacts	<ul style="list-style-type: none"> Consultation would be carried out with other project teams within Roads and Maritime for the other developments discussed to coordinate traffic management in the wider area, especially during peak periods. 	Roads and Maritime	Pre-construction/construction	-
CI2	Cumulative impacts	<ul style="list-style-type: none"> All environmental management plans would be prepared to consider other developments in the area. 	Contractor	Pre-construction	-

5.3 Licensing and approvals

Table 5-2 lists the licences and approvals needed before starting construction onsite.

Table 5-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Roads Act 1993</i>	A Road Occupancy Licence would be required from the relevant roads authority by the Contractor for road works and any temporary road closures.	Prior to the start of the activity.

6. References

NSW Government 1993, Roads Act, Sydney

Roads and Maritime 2018, Chandos Street Noise Wall Installation Review of Environmental Factors

Roads and Maritime 2015, Noise Mitigation Guideline, Sydney

Appendix A

Community notification

Review of Environmental Factors (REF)

Roads and Maritime has prepared a Review of Environmental Factors (REF) to assess the environmental impacts of the proposed Chandos Street Noise Wall. The REF covers the following:

- noise wall details including design specifics
- environmental impacts including proposed tree removal
- impacts during construction including proposed noisy work and night work
- noise benefits once completed.

The REF will be on display from 23 November until 14 December. You can review the REF by:

1. visiting rms.nsw.gov.au/nap
2. visiting North Sydney Council Chambers from 23 November until 14 December. The REF will be on display at the service desk.

Next steps

Roads and Maritime will consider community feedback and determine the Review of Environmental Factors for the Chandos Street Noise Wall. If approved, construction will begin mid 2019.

We will notify residents of the outcome.



Chandos Street Vegetation 10 years after planting



Warringah Freeway




St Thomas' Rest Park Vegetation 10 years after planting




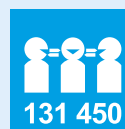
You can contact us at any time to learn more about the project or to provide your feedback.

 www.rms.nsw.gov.au/nap

 1800 312 772

 chandos@rms.nsw.gov.au

 Customer feedback
Roads and Maritime Services
Locked Bag 928, North Sydney NSW 2059



This document contains important information about transport projects in your area. If you need an interpreter, please call the Translating and Interpreting Service on **131 450** and ask them to call the project team on **1800 312 772**. The interpreter will then help you with translation.

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Chandos Street Noise Wall

The NSW Government is proposing to install a noise wall to reduce noise levels for nearby residents along the Warringah Freeway between St Thomas' Rest Park and Brook Street, Crows Nest



Chandos Street Noise Wall

For the past four months, Roads and Maritime Services has engaged with residents and stakeholders about the proposed Chandos Street Noise Wall at Crows Nest.

After consideration of community and stakeholder feedback, Roads and Maritime has decided to proceed with the Chandos Street Noise Wall.

We will be holding a community feedback session on **Thursday 29 November** to present the final design details.

Community feedback

The sentiment from the community was generally supportive of the noise wall. The main concerns raised were:

- 1. loss of trees
- 2. overshadowing
- 3. safety concerns
- 4. construction impacts to properties.

This feedback has been an integral part of informing the proposed final design for the Chandos Street Noise Wall.

We thank the community for its input.

Final design details

The new proposed noise wall will be constructed from:

1. St Thomas' Rest Park to the existing brick wall at the end of Jenkins Lane. We will not be removing the existing brick wall.

The noise wall will measure about four and a half metres high and 180 metres long. Part of the wall will be built using clear plexiglass to allow natural light through for properties. An artist impression has been attached for your information.
2. Brook Lane to the end of the existing brick wall at Jenkins Lane. The noise wall will measure about three metres high and about 17 metres long. By reducing the length of the wall, we have considered safety concerns and may reduce impacts to trees in the vegetated area.



Chandos Street Noise Wall elevation—artist's impression

Proposed Chandos Street Noise Wall



IMAGE SOURCED FROM NEARMAPS

Community feedback session

We will be holding a community feedback session for you to meet our project team and see the final design details for the Chandos Street Noise Wall.

We invite you to drop in anytime between **3pm** and **7pm**.

Venue: Crows Nest Centre
2 Ernest Place,
Crows Nest

Date: Thursday
29 November

Time: 3pm to 7pm

Contact

If you have any questions, please contact the project team on 1800 312 772 between 8.30am and 5.00pm, Monday to Friday or email chandos@rms.nsw.gov.au

We look forward to seeing you at the community feedback session.



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