Batemans Bay Bridge replacement – former bowling clubhouse demolition

Addendum review of environmental factors

Roads and Maritime Services | September 2018

NSW GOVERNMENT

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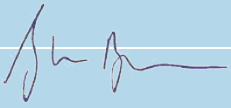
Prepared by Advisian Pty Ltd and Roads and Maritime Services

Document controls

Approval and authorisation

Title	Batemans Bay Bridge replacement – Former bowling clubhouse demolition Addendum review of environmental factors
Accepted on behalf of NSW Roads and Maritime Services by:	Shaun Foster Project Manager / Engineer Regional Project Office
Signed: 	
Dated: 10/9/2018	September 2018

Executive summary

The proposed modification

In 2018, Roads and Maritime Services determined a review of environmental factors (REF) for the Batemans Bay Bridge replacement project (the project REF). It identified an opportunity to modify the former bowling club site at 3 Vesper Street Batemans Bay to establish an ancillary site to support major work of the Batemans Bay Bridge replacement project. An ancillary site is a temporary facility used during construction to accommodate offices and amenities, workshops and areas to store materials.

The proposed modification includes:

- demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site
- levelling of the site to create a surface suitable for use as an ancillary facility during construction of the project
- construction of temporary facilities such as paved areas, offices, sheds, workshops and storage areas.

To address these proposed changes, an addendum REF (AREF) has been prepared to document the potential environmental impacts of the proposed modification.

Background

As identified in the project REF, an ancillary facility is proposed at the former bowling club site. The site currently comprises buildings, bowling greens and associated infrastructure. The site is owned by Eurobodalla Shire Council and has been unused since 2013. The site is leased to Roads and Maritime for the project construction period for use as an ancillary facility. As part of establishing an ancillary site, the project REF identified the need to demolish some structures at the former bowling club site. Roads and Maritime, in consultation with Eurobodalla Shire Council, identified an opportunity to demolish and remove the former clubhouse and bowling greens on the site to provide additional space for the ancillary facility.

Need for the proposed modification

Section 2 of the project REF addresses the strategic need for the project and the benefits it would have in achieving the project objectives. The proposed modification assessed in this AREF is consistent with the strategic need for the project and achieving the project objectives.

The proposed modification is needed to provide additional space for the ancillary facility. It would allow for a safer and more efficient work environment due to a less constrained site with improved access. Improved use of the site layout would also enable higher risk activities, such as storage of fuels, chemicals and liquids, to be carried out in separate areas and away from the adjacent wetlands. Demolition of the former clubhouse building and other infrastructure would provide a clear and level site for Eurobodalla Shire Council with no ongoing maintenance issues and opportunity for the future use of the land. The Council voted in support of the demolition of the former clubhouse building in a council meeting held on 12 June 2018 (refer section 5.2).

Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification.

The proposed modification supports the overall project objective by establishing an ancillary facility that allows for the safe and efficient construction of the Batemans Bay Bridge replacement project with minimal environmental and socio-economic impacts.

Options considered

As the proposed modification is an expansion of the building removal work already included in the project REF, the options considered are:

- Option 1 – Do Nothing. This option would enable the use of the former bowling club site as an ancillary site but would only allow for some of the existing buildings and other infrastructure to be demolished.
- Option 2 – Proposed modification. This option would enable the use of the former bowling club site as an ancillary site to proceed and would also allow for the demolition and complete removal of the former clubhouse building and other infrastructure.

Option 2 was selected as the preferred option as it would provide for additional space for the ancillary facility, allowing for a safer and more efficient work environment due to a less constrained site with improved access. Option 2 would also provide Council with a clear and level site with no ongoing maintenance issues and opportunity for future use of the land. Option 2 would support the overall project objective of delivering the Batemans Bay Bridge replacement project in a safe and efficient manner with minimal environmental and socio-economic impacts.

Statutory and planning framework

The Batemans Bay Bridge replacement project was approved under former Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in April 2018.

Roads and Maritime is the proponent and determining authority for the proposed works. Clause 94 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by, or on behalf of, a public authority without consent. As the proposed modification is for a road and is to be carried out on behalf of Roads and Maritime, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

Community and stakeholder consultation

Consultation was undertaken with Eurobodalla Shire Council and the Department of Primary Industries (Fisheries) to inform this AREF. No additional community consultation was undertaken, although the Council's resolution to support demolition of the former clubhouse building was made publically available following its ordinary meeting of 12 June 2018 (refer section 5.2). Further, Council advised the community in a press release on 19 June 2018 that Roads and Maritime would demolish the former clubhouse building as part of the lease agreement with Council. An auction of furniture and other items from the former bowling club site was also advertised and carried out by Council in June 2018. Roads and Maritime informed the community of its plan to demolish the former clubhouse site and build an ancillary facility in August 2018. Subject to determination, this AREF will be published on the Roads and Maritime website.

Environmental impacts

The main environmental impacts and mitigation measures for the proposed modification include:

- **Noise and Vibration.** A noise assessment has been undertaken as part of the AREF to assess potential noise impacts from the proposed modification. The Roads and Maritime Construction Noise Estimator tool was used and conservative assumptions were made. The results showed that the proposed modification would result in some exceedances of Noise Management Levels (NMLs) at six of

the seven nearby sensitive receivers including one residential receiver, two commercial / retail receivers and three active recreational receivers. The remaining nearby commercial / retail receiver would not experience exceedances of the NMLs. Vibration impacts in relation to human comfort (response) may occur at five sensitive receivers located within 100 metres of the site including one residential receiver, two commercial / retail receivers and two active recreation receivers. However vibration emissions would be short and intermittent in nature for the proposed modification. Potential noise and vibration impacts would be managed through implementation of the safeguards and management measures identified in the project REF submissions report, including measures in the Roads and Maritime Construction Noise and Vibration Guideline (2016).

- **Waste.** The proposed modification would result in a small amount of additional demolition waste being generated for the project. The proposed modification would disturb asbestos containing material that has been identified within the former clubhouse building and other infrastructure. There is potential for other hazardous materials such as paint containing lead or other hazardous metallic pigments, treated timbers and polychlorinated biphenyls to also be present in demolition materials. Potential waste management impacts would be managed with the safeguards and management measures identified in the submissions report, including removal and disposal of asbestos containing material and other hazardous materials by an appropriately licenced contractor.
- **Soil and water quality.** Potential soil and water quality impacts from the proposed modification during construction include erosion and sedimentation, spills and leaks of fuel, oils and other chemicals, acid sulfate soils and contaminated soils. In order to manage site runoff, management measures outlined in the submissions report including erosion and sediment controls (such as bunding) would be implemented at the former bowling club site, including at the boundaries adjacent to wetland area, for the duration of use of the ancillary facility. Phase 1 contamination investigations undertaken for the project REF did not identify potential for contamination at the former bowling club site. However, further investigation would be undertaken to confirm existing site conditions and to determine the presence of contaminated soils or acid sulphate soils at the site. Potential soil and water quality impacts would be minimised through implementation of the safeguards and management measures described in the submissions report.

Justification and conclusion

The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. This AREF has examined and considered to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

Mitigation measures as detailed in this AREF would ameliorate or minimise the expected impacts of the proposed modification. Consistent with the project REF and submissions report, the proposed modification would allow the efficient construction of the Batemans Bay Bridge replacement project. On balance, the proposed modification is considered justified.

The environmental impacts of the proposed modification are not likely to be significant and therefore it is not necessary for an environmental impact statement to be prepared and approval for the proposed modification to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. The proposed modification is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or the *Fisheries Management Act 1994* and therefore Species Impact Statement is not required. The proposed modification is also unlikely to affect Commonwealth land or have a significant impact on any matters of national environmental significance.

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1. Introduction

1.1 Proposed modification overview

Roads and Maritime Services proposes to modify the Batemans Bay Bridge replacement project (the project) by including the demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site at 3 Vesper Street Batemans Bay (Lot 282 and 283 DP 755902) (the proposed modification). The proposed modification is required to further facilitate the establishment and use of a project ancillary facility at this site.

The former bowling club site comprises buildings, bowling greens and associated infrastructure. The site is owned by Eurobodalla Shire Council and has been unused for around five years, since 2013. The site is leased to Roads and Maritime for the project construction period for use as an ancillary facility.

The Batemans Bay Bridge replacement review of environmental factors (REF) (project REF) was placed on public display between 8 November and 8 December 2017 for community and stakeholder comment. The Batemans Bay Bridge replacement REF submissions report (the submissions report) was published in May 2018 to respond to the issues raised during the display period.

An environmental impact statement (EIS) was also published for the project in November 2017, as a small part of the project is located on land to which the State Environmental Planning Policy No 14 – Coastal Wetlands (SEPP 14) (now repealed) applied. Development consent for this part of the project was issued by Eurobodalla Shire Council in May 2018.

Figure 1-1 illustrates the location of the proposed modification in relation to the REF area and EIS area. Although the former bowling club site is located within both the REF area and the EIS area, the proposed modification falls wholly within the REF area and therefore an addendum REF (AREF) is required. A modification to the development consent for the EIS area is not required.

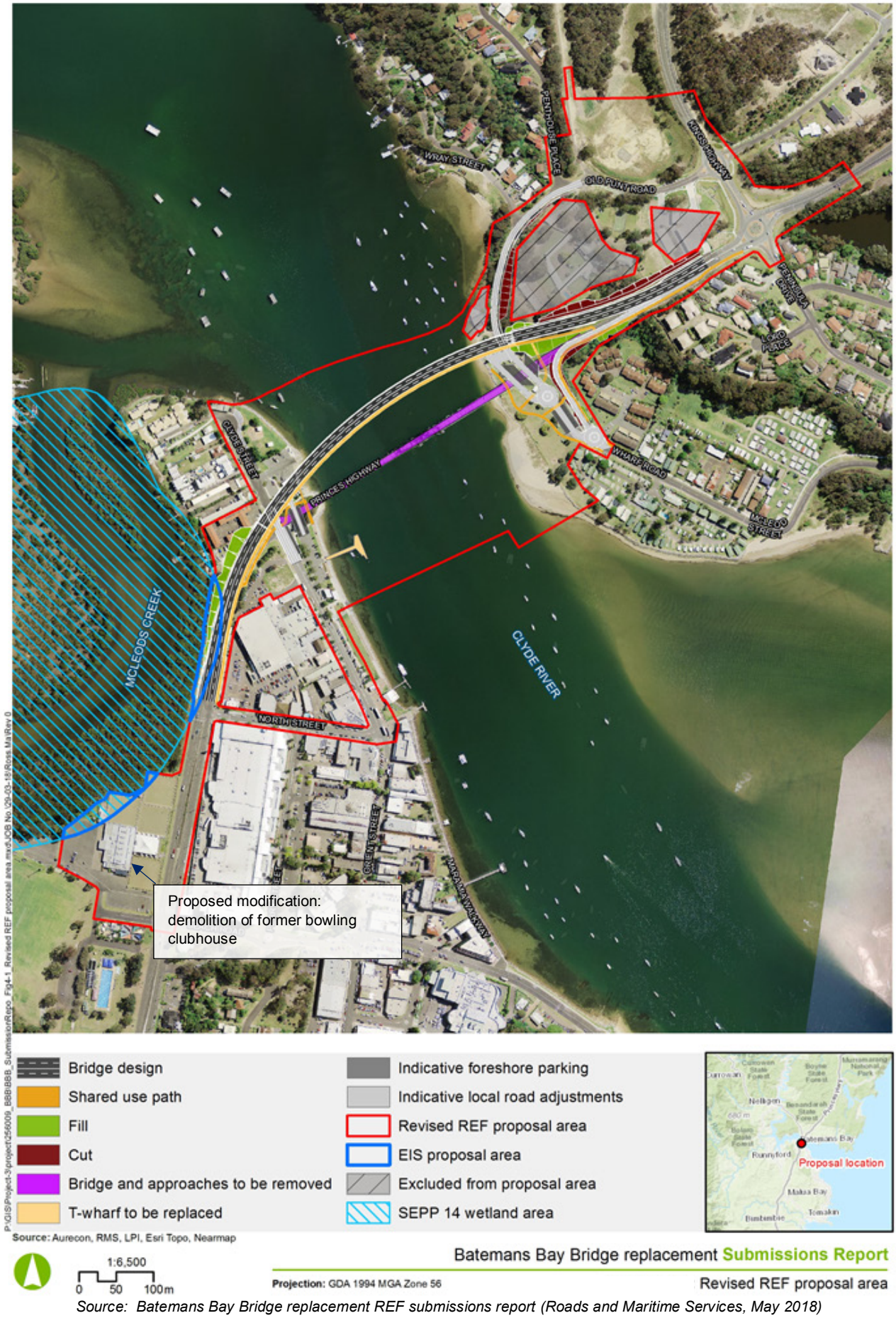
The project REF identified the former bowling club site as a currently unused site that would be leased for use as an ancillary facility to support construction of the project. The project REF also identified that some of the existing structures at the site may be demolished or used during construction (refer Table 3-5 of the project REF). The proposed modification is consistent with the intent of the ancillary facilities strategy outlined in section 3.4 of the project REF, but now seeks to demolish and remove the former clubhouse building and other infrastructure to enable more efficient use of the site for construction of the project. This AREF has therefore been prepared to amend the project REF to fully assess the proposed modification.

Key features of the proposed modification are:

- demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site
- levelling of the site to create a surface suitable for use as an ancillary facility during construction of the project
- installation of additional temporary ancillary facility infrastructure such as hardstand areas, site offices, sheds, workshops and storage areas.

Section 3 describes the proposed modification in more detail.

Section 4 of this AREF discusses the statutory and planning framework for the project, including SEPP 14 which was repealed in April 2018.



Source: Batemans Bay Bridge replacement REF submissions report (Roads and Maritime Services, May 2018)

Figure 1-1: Location of the proposed modification in relation to the REF and EIS areas

1.2 Purpose of the report

This AREF has been prepared by Advisian on behalf of the Roads and Maritime Regional Project Office - Southern. For the purposes of these works, Roads and Maritime is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Although the former bowling club site is located within both the REF area and the EIS area, the proposed modification falls wholly within the REF area and is therefore subject to an AREF.

This AREF is to be read in conjunction with the project REF and submissions report. The purpose of this AREF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment and to detail the mitigation and management measures to be implemented.

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (*Is an EIS Required?* guidelines) (DUAP, 1995/1996), *Roads and Road Related Facilities EIS Guideline* (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the AREF helps to fulfil the requirements of section 5.5 of the EP&A Act, including the requirement that Roads and Maritime examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

The findings of the AREF would be considered when assessing:

- whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- the significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- the potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of the Environment and Energy for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposed modification

Section 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this AREF is consistent with the strategic need for the project.

The proposed modification is required to provide sufficient space to establish and use the former bowling club site ancillary facility to support construction of the project. The proposed modification would also enable a safer and more efficient work environment by providing a less constrained site with opportunities for increased parking and improved access. The former bowling club site is owned by Eurobodalla Shire Council and has been unused for around five years. Eurobodalla Shire Council voted in support of the demolition of the former clubhouse building in the Council meeting held on 12 June 2018 (refer section 5.2). The proposed modification is supported by Council as it would provide a clear and level site at the end of the project construction period with minimal ongoing maintenance issues that would allow flexibility for future land use options.

2.2 Proposal objectives and development criteria

Section 2.3 of the project REF identifies the project objectives. The proposed modification supports the overall project objective through the establishment of an ancillary facility that would enable the safe and efficient construction of the Batemans Bay Bridge replacement project with minimal environmental and socio-economic impacts.

2.3 Alternatives and options considered

Section 3.4 of the project REF discusses the options considered for the ancillary facilities associated with the Batemans Bay Bridge replacement project. The options considered for the modification are reviewed in the sections below.

2.3.1 Methodology for selection of preferred option

Section 3.4 of the project REF outlines the type of ancillary facilities required to support the project and identifies five ancillary facility sites. These sites were located in areas that maximised the use of existing buildings and other infrastructure and / or vacant land and were evaluated against site assessment criteria.

Table 3.5 of the project REF identified that that some of the existing structures at the former bowling club site may be demolished or used during project construction. Further design development has identified limitations associated with the use of the existing structures and access to the remainder of the site. As a result, options were identified and assessed that would optimise use of the site as a project ancillary facility and provide Eurobodalla Shire Council with flexibility for future land use options following project construction.

As the proposed modification is an expansion of the demolition work already included in the project REF, the options considered below only include the ‘do nothing’ or ‘proposed modification’.

2.3.2 Identified options

Option 1 – Do nothing

This option would enable the use of the former bowling club site as an ancillary facility and allow for only some of the existing buildings and other infrastructure to be demolished, as identified in the project REF.

Option 2 – Proposed modification

This option would allow for the demolition and complete removal of the former clubhouse building and other infrastructure to enable more efficient use of the former bowling club site as a project ancillary facility.

2.3.3 Analysis of options

Option 1 – Do nothing

This option would mean that some existing structures would still occupy the site. Vehicle and pedestrian movements during project construction would be constrained, in particular movement of plant and equipment between existing structures. Laydown and storage would be restricted due to the need to offset items safely from existing infrastructure.

Potential loss of parking during the project construction period was identified as an issue in the project REF and submissions report. Section 6.9.3 of the project REF identifies that use of the former bowling club site as an ancillary facility could impact on parking at the adjoining oval (although parking requirements for the oval would be highest during the weekends, whereas construction activities would be highest during the week). Less parking for project staff would be available at the ancillary facility under this option, which could result in increased demand on public parking in nearby areas.

As the former bowling club site has been unused for the past five years, this option also presents ongoing maintenance issues for Eurobodalla Shire Council.

Option 2 – Proposed modification

The demolition of the former clubhouse building and other infrastructure would provide a clear and level site suitable for its temporary use and allow for optimisation of the site layout including:

- opportunities for additional parking within the site for project staff
- facilitation of safer vehicle and pedestrian movements within the site including improved turning paths for heavy vehicles, thus reducing the need for reversing
- efficiencies in vehicle types used to deliver to site, loading/unloading and reducing the risk of queuing on the local road network
- separation of office space and light vehicle parking from laydown areas
- allocation of additional and consolidated space for storage of materials, containers and equipment to enable improved site organisation
- better separation of higher risk activities, such as storage of fuels, chemicals, and liquids, from adjacent wetland areas
- elimination of the need for internal building modifications, repairs and ongoing maintenance
- general facilitation of improved safety and efficiency for project staff.

By making use of the full site potential, advantages to the public would include:

- reduction in the time and space required for construction around the foreshore areas
- reduction in construction vehicle movements around Batemans Bay between various alternative ancillary facilities, improved productivity and separation of construction traffic from local traffic
- reduction in frequency and duration of noise associated with reversing heavy vehicles

- reduction in demand on public parking and the need for project staff and visitors to cross the Princes Highway from nearby parking areas to access the ancillary facility
- provision of a clear and level site to Eurobodalla Shire Council at the end of the project construction period with minimal ongoing maintenance issues allowing flexibility for future land use options.

2.4 Preferred option

The preferred option is Option 2 as it provides a safer and more efficient work environment, with improved access to the ancillary facility. Option 2 would also return to Eurobodalla Shire Council a clear and level site at the end of the project construction period with minimal ongoing maintenance issues which would allow flexibility for future land use options.

3. Description of the proposed modification

3.1 The proposed modification

Roads and Maritime proposes to modify the project REF to include demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site at 3 Vesper Street Batemans Bay. The proposed modification is shown in Figure 1-1.

The former bowling club site has been unused for around five years, since 2013. The former clubhouse building occupies an area of around 3000 square metres and comprises a brick building on a concrete slab with various roofing materials, including steel. A large underground water storage tank is also thought to be present on the site. Asbestos containing material has been identified in areas of the existing building, including in some eaves and the ceiling lining (refer section 6.2.2). Four former bowling greens are present on the site with associated irrigation, drainage, lighting, seating and fencing infrastructure. Asbestos containing material has been identified in irrigation hatch covers and bowling green gutters (refer section **Error! Reference source not found.**).

The former clubhouse building and other infrastructure would be demolished and removed. The footprint of the demolished building and the remainder of the site would be levelled to create a suitable surface for use as an ancillary facility during construction of the project. As identified in the project REF, the site could accommodate a site compound that incorporates site offices, sheds, workshops and storage; areas for the delivery and storage of materials and equipment; and areas for treating water.

As the existing building and other infrastructure are proposed to be removed, installation of additional temporary ancillary facility infrastructure such as hardstand areas, site offices, sheds, workshops and storage facilities would be required to support construction of the project. The proposed modification would enable the layout of this ancillary facility to be optimised to allow for a safer and more efficient work environment due to a less constrained site with improved access. Optimisation of the site layout would also enable better separation of higher risk activities, such as storage of fuels, chemicals and liquids, from adjacent wetland areas.

As identified in the project REF, upon completion of construction, the ancillary facility would be removed and the site rehabilitated in consultation with Eurobodalla Shire Council as the property owner. Council has identified that a clear and level site is preferred at the completion of construction (refer section 5.2).

3.2 Design

3.2.1 Design criteria

The proposed modification has been designed using the same standards and criteria as described in section 3.2 of the project REF.

3.2.2 Engineering constraints

The engineering constraints presented in section 3.2.2 of the project REF apply to the proposed modification and would be managed in the same manner as described in the project REF.

3.2.3 Main features of the modification

The main features of the proposed modification are:

- demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site
- levelling of the site to create a surface suitable for use as an ancillary facility during construction of the project
- installation of additional temporary ancillary facility infrastructure such as hardstand areas, site offices, sheds, workshops and storage areas.

3.3 Construction activities

The proposed modification would be completed as part of the project under the methods and program described in section 3.3 of the REF.

3.3.1 Work methodology

The project REF identified the need for demolition and removal of some buildings to enable construction and operation of the project. The work methodology for building demolition and removal activities is described in section 3.3.2 of the project REF. The methodology for the proposed modification would be consistent with the project REF and would include:

- initial 'soft stripping', comprising manual removal of non-structural elements including any asbestos containing material
- progressive mechanical demolition of the building and other infrastructure using modified excavators
- sorting and temporary storage of demolition material into recyclable and waste components
- loading and transporting recyclable and waste material to an appropriately licenced facility.

As described in the project REF, demolition would be undertaken in compliance with Australian Standard AS2601: The demolition of structures. Any asbestos containing material would be managed and removed by an appropriately licensed contractor.

3.3.2 Construction hours and duration

The works associated with the proposed modification would be anticipated to commence in late 2018 and would take around two months to complete. The demolition would be staged due to the presence of asbestos containing material and requirement for soft stripping prior to heavy machinery being used.

The proposed work would be undertaken during the standard construction hours:

- Monday to Friday: 7 am to 6 pm
- Saturdays: 8 am to 1 pm
- no work on Sundays and public holidays.

In accordance with the Construction Noise and Vibration Guideline (Roads and Maritime, 2016), activities with impulsive or tonal noise emissions would be carried out only within the following hours:

- Monday to Friday: 8 am to 5 pm
- Saturday: 9 am to 1 pm
- no work on Sundays and public holidays.

Work with impulsive or tonal noise emissions would be carried out in continuous blocks not exceeding three hours each with a minimum respite of at least one hour between each block.

No out of hours works are anticipated for the modification works. If required, any works outside of the standard hours would be undertaken in accordance with Roads and Maritime's Construction Noise and Vibration Guideline (2016) consistent with the project REF.

3.3.3 Plant and equipment

Plant and equipment that would be used for the proposed modification include:

- bobcat
- dump truck
- excavator
- pneumatic hammer
- jackhammer
- grader
- roller
- water cart
- cutting tools (including oxy, angle grinders and concrete saws).

The plant and equipment to be used for the modification are generally consistent with those identified in the project REF for establishment works, building removal, minor earthworks and finishing works (refer Table 3-2 of the project REF).

The proposed modification would include use of a crusher bucket excavator attachment (specialist demolition equipment) to crush inert waste material for recycling. Use of a crusher bucket excavator attachment is consistent with the building removal activities described in section 3.3.2 of the project REF, which describes the use of modified excavators and the sorting and storage of demolition material into recyclable and waste components. The crusher bucket excavator attachment is considered necessary for the proposed modification and is also consistent with best management practice of crushing and reuse of inert waste material.

3.3.4 Earthworks

The earthworks for the proposed modification would be minimal, involving the backfilling and levelling of demolition areas to create a suitable surface for use during construction. These activities are consistent with section 3.3.5 of the project REF.

3.3.5 Source and quantity of materials

As described in the project REF, the materials required for the proposed modification would be obtained from local sources where possible. The source and quantity of materials for the project are outlined in section 3.3.6 of the project REF. Table 3-1 identifies the types and quantities of material that would be imported for the proposed modification, which would be consistent with the project REF.

Table 3-1: Types and quantities of imported material for the proposed modification

Imported material	Approximate Quantity
Clean fill or road base (to backfill void from building demolition, if required) As described in section 2.3.8 of the submissions report, all fill material to be imported to the site would be certified as being clean fill through visual inspections and testing. Any fill won from other parts of the project area would be verified as suitable material.	600 m^3
Site sheds	1000 m^2
Perimeter fencing (to be removed at the end of the project construction period)	270 m
Sprayed seal / grass / compacted gravel (to be imported towards the end of the project construction period for rehabilitation of the site, as described in section 3.2.3)	10,000 m^2

3.3.6 Traffic management and access

The traffic management and access requirements outlined in section 3.3.8 of the project REF would be applicable to the proposed modification.

3.4 Ancillary facilities

The five ancillary facilities required for the project are described in section 3.4 of the project REF with indicative land uses detailed in Table 3.5. The proposed modification only affects the former bowling club site within the project REF area. No changes to the other ancillary facilities are proposed as part of this AREF.

Existing available areas of the former bowling club site would be utilised to support the proposed demolition and establishment activities at the site. Once established, the ancillary facility would be used to support construction of the project, as described in the project REF.

3.5 Public utility adjustment

Utility adjustments are discussed in section 3.5 of the project REF and would be consistent for the proposed modification. Service disconnections and removal or capping of utility infrastructure within the former bowling club site would be undertaken prior to commencement of demolition works. All utility adjustments required for the proposed modification would be finalised in consultation with utility providers.

3.6 Property acquisition

There are no changes to the property acquisition requirements outlined in section 3.6 of the project REF.

4. Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for road infrastructure facilities and is to be carried out on behalf of Roads and Maritime, it can be assessed under Division 5.1 of the EP&A Act. Development consent from the Eurobodalla Shire Council is not required.

The proposed modification is not located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act) and does not affect land or development regulated by State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (Major Development) 2005.

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

State Environmental Planning Policy No. 14 – Coastal Wetlands (repealed)

A summary of the State Environmental Planning Policy No. 14 – Coastal Wetlands (SEPP 14) is included in section 4.2.2 of the project REF. Since determination of the project REF, coastal management legislation in NSW has been amended. SEPP 14 was repealed by State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP) on 3 April 2018.

As a small part of the project is located on land to which SEPP 14 (now repealed) applied, designated development under Part 4 of the EP&A Act was triggered requiring the preparation of an EIS for this part of the project. Development consent for this part of the project was issued by Eurobodalla Shire Council in May 2018. The remainder of the project was assessed in an REF and determined under former Part 5 of the EP&A Act in April 2018.

As the proposed modification falls wholly within the REF area, a modification to the development consent for the EIS area is not required.

State Environmental Planning Policy No. 71 – Coastal Protection (repealed)

State Environmental Planning Policy No. 71 – Coastal Protection (SEPP 71) was not applicable to the project REF as discussed in section 4.2.3. SEPP 71 was repealed by the Coastal Management SEPP 2018 on 3 April 2018.

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP) commenced on 3 April 2018. The Coastal Management SEPP consolidated and repealed SEPP 14, State Environmental Planning Policy No. 26 - Littoral Rainforests and SEPP 71. The Coastal Management SEPP gives effect to the objectives of the *Coastal Management Act 2016* (CM Act) from a land use planning perspective.

Under the Coastal Management SEPP, coastal wetland mapping has been refined and no longer includes part of the former bowling club site that was previously mapped as SEPP 14 wetlands. However, the proximity area for coastal wetlands under the Coastal Management SEPP extends over a larger area of the former bowling club site (shown hatched on Figure 4-1). The Coastal Management SEPP also maps the former bowling club site as being within the coastal environment area and the coastal use area.

The project REF was prepared prior to the Coastal Management SEPP commencing. As such, the project and the proposed modification are subject to clause 21(2) 'Savings and transitional provisions' of the Coastal Management SEPP. While the Coastal Management SEPP does not apply to the proposed modification, as best practice, the provisions of the Coastal Management SEPP have been considered.

Clause 11(1) the Coastal Management SEPP states that the consent authority is to be satisfied that development on land identified as proximity area for coastal wetlands will not significantly impact on:

(a) 'the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or

(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.'

Clauses 13 and 14 of the Coastal Management SEPP require the consent authority to consider for land that is within a coastal environment area and coastal use area whether the proposed development is likely to cause an adverse impact on:

(a) 'the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,

(b) coastal environmental values and natural coastal processes,

(c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,

(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,

(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,

(f) Aboriginal cultural heritage, practices and places,

(g) the use of the surf zone.'

The proposed modification would not cause a significant or adverse impact on the matters identified in clauses 11(1), 13 and 14, including the adjacent coastal wetland. Through implementation of the proposed methodologies and mitigation measures outlined in the project REF, submissions report and this AREF, potential impacts would be avoided or minimised. Potential soil and water quality and biodiversity impacts and mitigation measures for the proposed modification are described in sections 6.3 and 6.4.

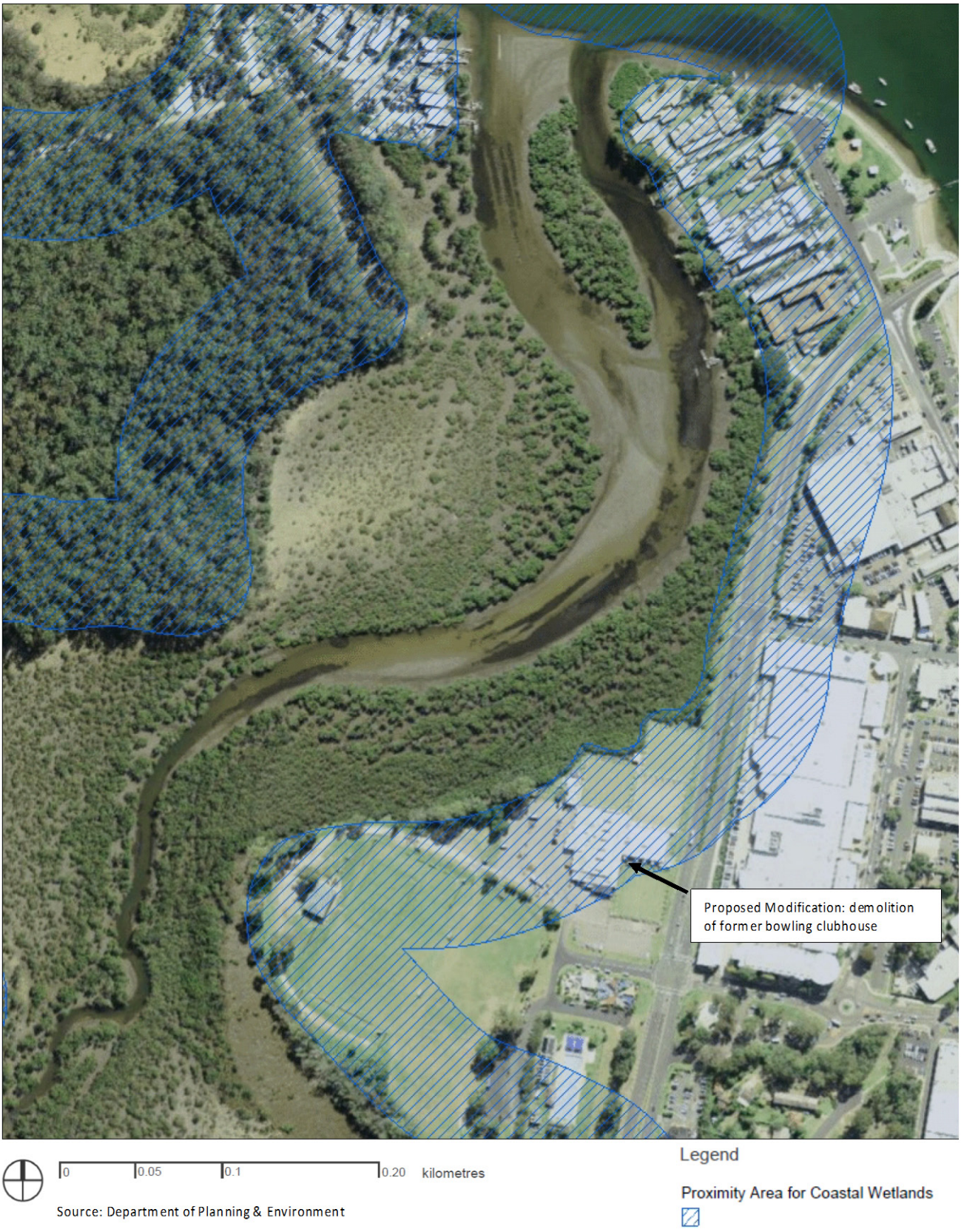


Figure 4-1: The proposed modification in relation to the proximity area for coastal wetlands

4.1.2 Local Environmental Plans

The proposed modification is located within land zoned RE2 Private Recreation under the Eurobodalla Local Environmental Plan 2012 (Eurobodalla LEP).

The objectives of the RE2 Private Recreation zone are:

- *'To enable land to be used for private open space or recreational purposes.*
- *To provide a range of recreational settings and activities and compatible land uses.*
- *To protect and enhance the natural environment for recreational purposes.*
- *To conserve the scenic and environmental resources of the land including the protection of environmental assets such as remnant vegetation, waterways and wetlands, and habitats for threatened species, populations and communities.'*

The proposed modification is consistent with the objectives of the RE2 Private Recreation zone as it would provide for a safe work environment and improved access to the ancillary facility and would also provide Eurobodalla Shire Council with a clear and level site at the end of the project construction with minimal ongoing maintenance issues.

As the proposed modification is permitted without consent under the ISEPP (refer section 4.1.1), the consent requirements of the Eurobodalla LEP do not apply.

4.2 Other relevant NSW legislation

4.2.1 Coastal Protection Act 1979

A summary of the *Coastal Protection Act 1979* (CP Act) is included in section 4.3.1 of the project REF. Since determination of the project REF, coastal management legislation in NSW has been amended. The CP Act was repealed by section 35 of the *Coastal Management Act 2016* on 3 April 2018.

The proposed modification is consistent with the intent of the CP Act as outlined in the project REF.

4.2.2 Coastal Management Act 2016

The CM Act replaced the CP Act and establishes a new strategic framework and objectives for managing coastal issues in NSW. The CM Act defines the coastal zone as comprising four coastal management areas: coastal wetlands and littoral rainforests area; coastal vulnerability area; coastal environment area; and coastal use area.

The proposed modification is situated within land identified by the Coastal Management SEPP as a coastal environment area and coastal use area.

Under section 8(2) of the CM Act, the management objectives for the coastal environment area are:

(a) 'to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons, and enhance natural character, scenic value, biological diversity and ecosystem integrity,

(b) to reduce threats to and improve the resilience of coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change,

(c) to maintain and improve water quality and estuary health,

(d) to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons,

(e) to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place,

(f) to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms.'

Under section 9(2) of the CM Act, the management objectives for the coastal use area are:

(a) 'to protect and enhance the scenic, social and cultural values of the coast by ensuring that:

(i) the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast, and

(ii) adverse impacts of development on cultural and built environment heritage are avoided or mitigated, and

(iii) urban design, including water sensitive urban design, is supported and incorporated into development activities, and

(iv) adequate public open space is provided, including for recreational activities and associated infrastructure, and

(v) the use of the surf zone is considered,

(b) to accommodate both urbanised and natural stretches of coastline.'

The proposed modification is consistent with the objectives for the coastal environment and coastal use areas as it would not have any adverse impacts on the coastal environment and is an appropriate development in the location.

4.2.3 Marine Estate Management Act 2014

A summary of the *Marine Estate Management Act 2014* is included in section 4.3.2 of the project REF. The proposed modification is consistent with the intent of the *Marine Estate Management Act 2014* as outlined in the project REF.

As the proposed modification is adjacent to a marine park declared under the *Marine Estate Management Act 2014* (Batemans Bay Marine Park), consultation with the Department of Primary Industries (DPI) (Fisheries) is required under the ISEPP (refer section 5.2).

4.2.4 Protection of the Environment Operations Act 1997

A summary of the *Protection of the Environment Operations Act 1997* (POEO Act) is included in section 4.3.3 of the project REF. The proposed modification does not require a separate environment protection licence (EPL) for scheduled activities or scheduled development work outlined in Schedule 1 of the POEO Act. However the modification would be carried out under the project EPL, if required (refer section 7.3).

4.2.5 National Parks and Wildlife Act 1979

A summary of the *National Parks and Wildlife Act 1979* is included in section 4.3.4 and section 6.5 of the project REF. The proposed modification remains consistent with the requirements of the Act.

4.2.6 Heritage Act 1977

A summary of the *Heritage Act 1977* is included in section 4.3.5 of the project REF. The proposed modification remains consistent with the requirements of the Act.

4.2.7 Water Management Act 2000

A summary of the *Water Management Act 2000* is included in section 4.3.6 of the project REF. The proposed modification remains consistent with the requirements of the Act.

4.2.8 Fisheries Management Act 1994

A summary of the *Fisheries Management Act 1994* is included in section 4.3.9 of the project REF. The proposed modification remains consistent with the requirements of the Act.

4.2.9 Biodiversity Conservation Act 2016

A summary of the *Biodiversity Conservation Act 2016* is included in section 4.3.11 of the project REF. The proposed modification remains consistent with the requirements of the Act.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These matters are considered in Appendix B and section 6 of the project REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a Strategic Assessment approval granted under the EPBC Act by the Australian Government in September 2015. Potential impacts to these biodiversity matters are also considered as part of section 6 and Appendix B of the project REF. As part of the submissions report, a supplementary impact assessment for the Illawarra and South Coast Lowland Forest and Woodland listed as Critically Endangered under the EPBC Act was conducted and concluded that the proposal is unlikely to result in a significant impact. The impacts to the narrow area of Illawarra and South Coast Lowland Forest and Woodland therefore did not require assessment in accordance with the Strategic Assessment under the EPBC Act.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the impact of the proposed modification on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of the Environment and Energy is not required.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road infrastructure facilities and is being carried out on behalf of a public authority. Under clause 94 of the ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

5. Consultation

5.1 Consultation strategy

The consultation strategy for the proposed modification is consistent with the strategy outlined in section 5.1 of the project REF.

5.2 Consultation outcomes

Consultation with the community on the preferred option for the project was undertaken during August and September 2017 as part of the preparation of the project REF. The project REF was placed on public display in November and December 2017 for community and stakeholder comment. A submissions report was prepared in May 2018 to respond to issues raised. Roads and Maritime consulted with the Aboriginal community for the project as outlined in section 5.3 of the project REF.

Consultation for the project was also undertaken with the following key stakeholders, as outlined in section 5.3 of the project REF:

- DPI (Fisheries)
- DPI (Crown Land)
- Office of Environment and Heritage
- Environment Protection Authority
- Eurobodalla Recreational Fishing Club
- oyster lease operators
- Sailability (not-for-profit sailing organisation for people with restricted mobility)
- Batemans Bay Chamber of Commerce
- Priors Bus Service
- utility service providers.

Roads and Maritime undertook consultation with Eurobodalla Shire Council for the project and has undertaken further consultation with Council regarding the proposed modification. The report to the ordinary meeting of the Eurobodalla Shire Council held on 12 June 2018 states:

> *"Whilst there has been community interest in the use of the building as is, the reasons to demolish the existing structure include:*
>
> - *It is the RMS preferred option allowing it to deliver the new bridge in the most efficient and least impactful way for Batemans Bay*
> - *the valuation assesses the site as being worth more with the building demolished*
> - *it is more cost effective for council, if RMS demolish the building, than it is for council to demolish it at the end of the lease*
> - *Council will be left with a clean and level site which is more attractive to potential responders to the Expression of Interest for the northern site*
> - *Council will not incur any cost to ongoing maintenance liabilities".*

At the meeting held on 12 June 2018 Eurobodalla Shire Council resolved to support the demolition of the bowling club. Council also resolved that the demolition should be undertaken in a manner that makes all reasonable attempts to reuse and recycle materials (refer section 6.2 for assessment of waste management).

Eurobodalla Shire Council notified the community via a press release on 19 June 2018 of its intention to lease the former bowling club site to Roads and Maritime, with demolition of the former clubhouse building forming part of the lease agreement. Council advertised an auction of furniture and other items from the former clubhouse building in the local on-line newspaper (the Beagle) on 23 July 2018.

In August 2018, a draft copy of this AREF was provided to Eurobodalla Shire Council for review. Council's comments have been incorporated into this AREF.

Roads and Maritime informed the community of its plan to demolish the former clubhouse site and build an ancillary facility in August 2018.

As the proposed modification works are adjacent to a marine park declared under the Marine Estate Management Act 2014 (Batemans Bay Marine Park), consultation with the Department of Primary Industries (DPI) (Fisheries) is required under the ISEPP. A consultation letter and a draft copy of this AREF were issued to DPI (Fisheries) on 24 August 2018.

The proposed modification does not require further consultation with other stakeholders as there are no additional relevant impacts as a result of the modification.

5.3 Ongoing or future consultation

Consultation with Council and the wider community will be ongoing during the design and delivery of the project, including the proposed modification. Subject to determination, this AREF will be put published on the Roads and Maritime website.

6. Environmental assessment

This section of the AREF provides a description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Batemans Bay Bridge replacement project. All aspects of the environment potentially impacted upon by the proposed modification have been considered. This includes consideration of the factors specified in the guidelines Roads and Related Facilities EIS Guideline (DUAP, 1996) and Is an EIS required? (DUAP, 1999) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix C.

Section 6 of the project REF provides information about the existing environment, potential impacts from the project and site-specific safeguards and management measures to be implemented to ameliorate the identified potential impacts. After consideration of the issues raised in the submissions (refer section 5 above), the environmental management measures for the project were revised and included in the submissions report.

Potential impacts and safeguards and mitigations measures for the proposed modification are identified in the following sections. The AREF provides information on the key issues associated with the modification which are noise and vibration, waste management, soil and water quality, landscape character and visual amenity, biodiversity, traffic and transport, socio-economic and air quality.

Detailed assessments of hydrology and coastal processes, Aboriginal heritage, property and land use, non-Aboriginal heritage, climate change and sustainability and cumulative impacts have not been included in this AREF as the potential impacts are consistent with the project REF. Notwithstanding, these aspects have been considered in the Clause 228 Checklist (Appendix B).

6.1 Noise and vibration

6.1.1 Existing environment

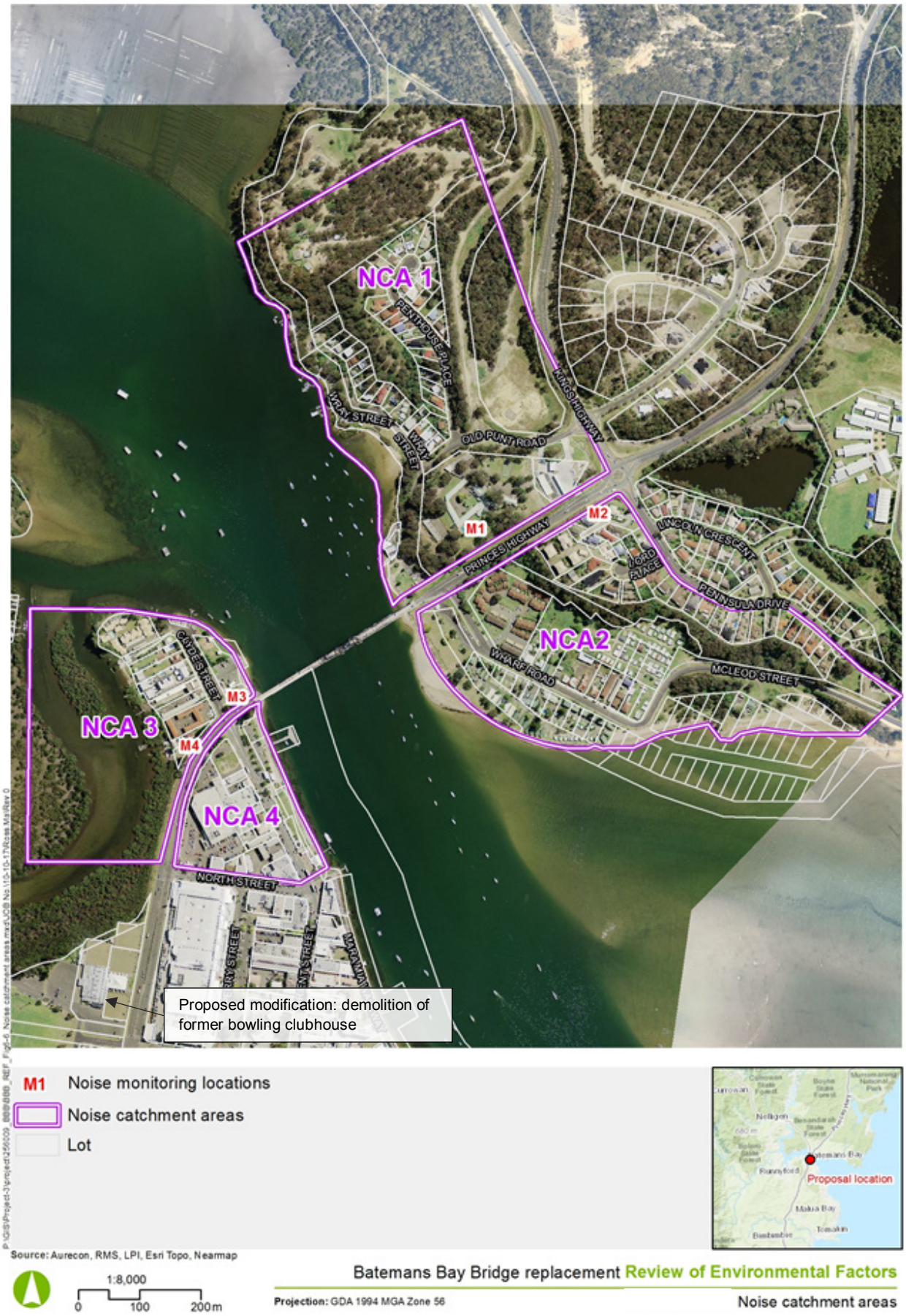
A Noise and Vibration Assessment (NVA) was undertaken by Renzo Tonin & Associates (2017) for the project REF (Appendix I to the project REF). A further NVA was undertaken by Renzo Tonin & Associates (2018) as part of the submissions report to address design changes (Appendix E to the submissions report). Four Noise Catchment Areas (NCAs) and monitoring locations were identified in the NVAs as shown on Figure 6-1 below.

There are seven potentially impacted receivers located within 165 metres of the proposed modification as shown on Figure 6-2 and also listed in Table 6-4. These include one residential receiver (IRT the Clyde retirement village), three commercial / retail receivers (Anytime Fitness, Village Centre and Batemans Bay Visitors Centre), and three active recreation receivers (Mackay Park, Batemans Bay mini golf and Batemans Bay swimming centre).

The closest background noise monitoring location to the proposed modification is location M3 at 23 Clyde Street, approximately 460 metres from the proposed modification site (Figure 6-1). The background noise levels recorded at this location are shown in Table 6-1 and have been adopted as they are considered to be representative of background noise levels in the vicinity of the proposed modification.

Table 6-1: Background noise levels at M3 (L_{A90}) (dBA))

Day	Evening	Night
57	46	42



Source: Batemans Bay Bridge replacement Review of environmental factors (Roads and Maritime Services, November 2017)

Figure 6-1: Project REF noise catchment areas

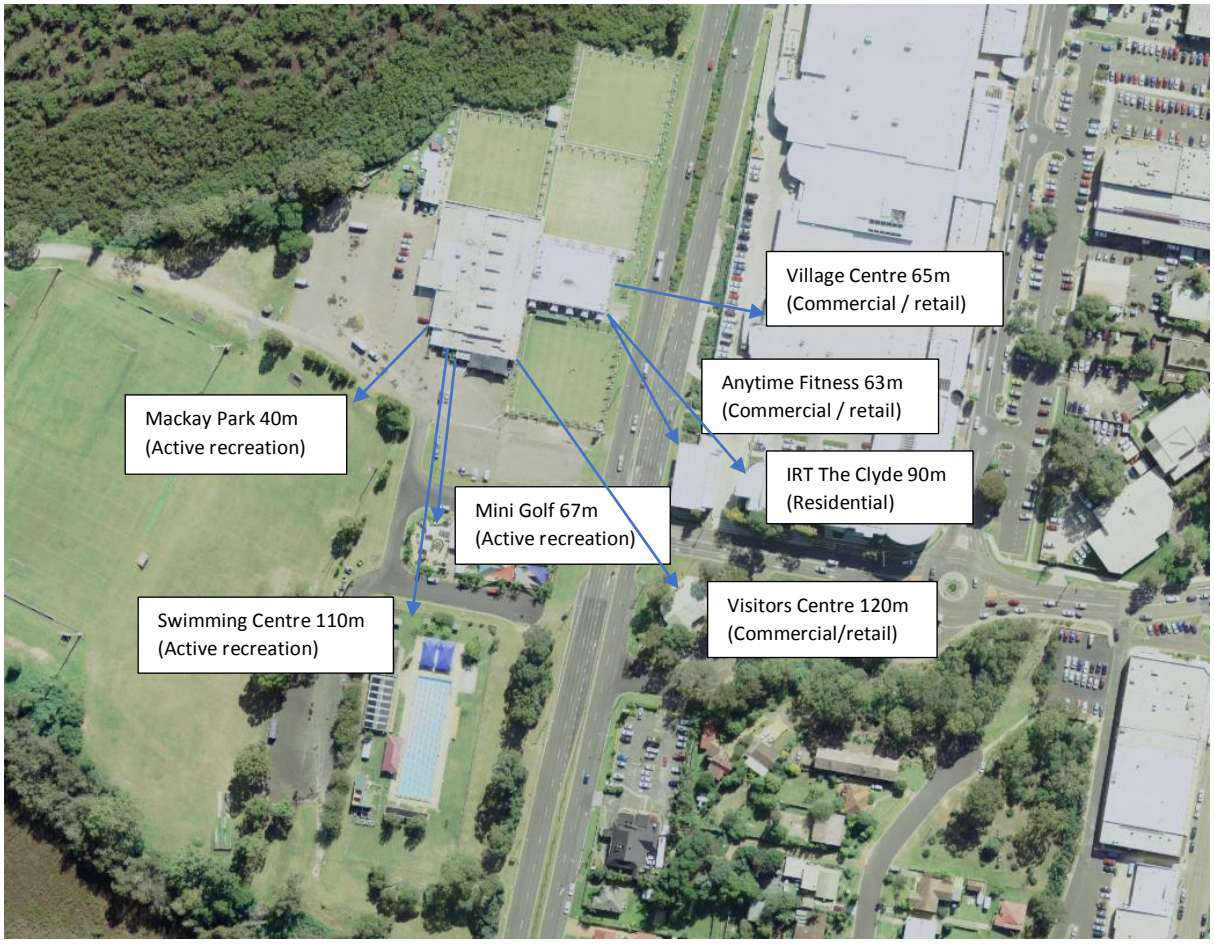


Figure 6-2: Potentially impacted receivers and distances to receivers from former clubhouse building

The noise management levels (NMLs) for residential receivers, based on the background levels at M3, adopted for the project REF are provided in Table 6-2. These NMLs have been adopted for the proposed modification.

Table 6-2: Noise management levels at residences ($L_{Aeq(15min)}$ (dBA))

Day	Evening	Night
67	51	47

The NMLs for passive recreation and commercial premises identified in the NVA are provided in Table 6-3 below. The NML for active recreation areas identified in the Interim Construction Noise Guideline (ICNG) (Department of Environment and Climate Change, 2009) is also shown in Table 6-3. These NMLs are similarly considered to be appropriate for the proposed modification and have been adopted.

Table 6-3: Noise management levels for recreation and commercial land uses

Land use	NML $L_{Aeq(15min)}$ (dBA)
Commercial	70
Passive recreation	60
Active recreation	65

6.1.2 Potential impacts

Construction

A noise assessment has been undertaken as part of the AREF to assess the potential noise impacts from the proposed modification. The Roads and Maritime Construction Noise Estimator has been used for the assessment and has been applied in accordance with the Construction Noise and Vibration Guideline (CNVG) (Roads and Maritime, 2016). The noise assessment is documented in the summary report in Appendix D.

Background noise levels at 23 Clyde Street (refer Table 6-1) were adopted in the assessment to represent the background noise levels in the vicinity of the proposed modification. The adopted NMLs for the modification are provided in Table 6-2 and Table 6-3.

The Construction Noise Estimator was used to calculate the predicted noise levels for standard construction hours for the structural demolition scenario. This scenario represents a conservative 'worst case scenario' with an sound power level of L_{Aeq} 122 dB(A).

The assessment predicted noise levels at potentially impacted receivers and compared these to the adopted NMLs. Results of the assessment are shown in Table 6-4.

Table 6-4: Predicted noise levels during standard construction hours

Sensitive receiver	Type of receiver	Shortest distance from site (m)	NML dB(A)	Predicted Noise Level $L_{Aeq\ (15\ min)}$ dB(A)	Level above NML dB(A)
Mackay Park	Active recreation	40	65	78	13
Commercial premises on corner of Princes Highway and Beach Road	Commercial / retail	63	70	75	5
Village Centre (shopping centre)	Commercial / retail	65	70	74	4
Batemans Bay Mini Golf	Active recreation	67	65	74	9
IRT The Clyde (retirement village) at 3 Beach Road	Residential	90	67	72	5
Batemans Bay Swimming Centre	Active recreation	110	65	70	5
Batemans Bay Visitors Centre	Commercial / retail	120	70	69	-

Mackay Park, the closest sensitive receiver, is identified as highly noise affected at the closest boundary to the demolition works. However it should be noted that this park extends over a large area and is not in constant use. Eurobodalla Shire Council has advised that Mackay Park is mainly used during the football season (March to September) two nights per week for training and every second Sunday for games. This usage would generally be outside of the standard construction hours outlined in section 3.3.2. Therefore, it is anticipated that impacts on receivers using the park would be minimal and receivers would not generally be exposed to the noise level conservatively predicted at the boundary of the park closest to the demolition works.

The construction impacts presented in Table 6-4 are based on the worst-case noise construction scenario for demolition works assuming all equipment operates concurrently, that there are minimal offset distances between equipment and receivers and no barriers or site hoardings to mitigate noise measures. The proposed modification is expected to produce noise levels less than those provided in Table 6-4. The Construction Contractor would re-assess the construction noise impacts in accordance with the ICNG and CNVG based on actual construction scenarios, timings, offset distances and equipment developed as part of a construction noise and vibration impact statement (CNVIS). The CNVIS would describe the construction impacts and the necessary noise management and mitigation measures to be implemented in line with the Contractor's Construction Noise and Vibration Management Plan (CNVMP).

The Construction Noise Estimator makes recommendations for mitigation measures based on the results of the noise assessment. The recommended measures for the users of Mackay Park and the Commercial premises on the corner of Princes Highway and Beach Road include notifications (letterbox drop or equivalent), phone calls and verification of predicted noise levels if required. The required measures would be confirmed in the CNVIS prior to commencement of works.

These mitigation measures are consistent with the noise and vibration safeguards and management measures outlined in the submissions report. The measures will be included in the Contractor's NVMP to be prepared and implemented as part of the Construction Environmental Management Plan (CEMP).

No specific mitigation measures are required for the other sensitive receivers near the proposed modification, as identified in Table 6-4.

Construction traffic noise

The nature and scale of construction traffic noise impacts is consistent with the project REF.

Construction vibration

Vibration generated by construction plant for the project is discussed in section 6.6.4 of the project REF and section 5 of the NVA.

The CNVG recommends minimum working distances for vibration intensive plant from sensitive receivers, which are consistent with those listed in Appendix I of the project REF. Table 6-5 shows the plant items relevant to the proposed modification and their recommended working distances.

Table 6-5: Recommended minimum working distances for vibration intensive plant from sensitive receiver

Plant item	Rating / Description	Minimum working distance (m)	
		Cosmetic damage (BS 7385[1])	Human response (OEH Vibration guideline[2])
Vibratory Roller	< 300 kN (Typically 13-18 tonnes)	20	100
Medium Hydraulic Hammer	(900 kg – 12 to 18 t excavator)	7	23
Jackhammer	Hand held	1 (nominal)	2

[1] *BS 7385 British Standard (1993). Evaluation and measurement for vibration in buildings Part 2*
[2] *Office of Environment and Heritage (2006) Assessing Vibration - a technical guideline.*

For the proposed modification, there are no vibration sensitive receivers or structures located within the minimum working distances for cosmetic damage. In relation to human comfort (response), the minimum working distances in Table 6-5 relate to continuous vibration. Vibration emissions would be short and intermittent in nature for the proposed modification.

Vibration impacts for the proposed modification would be managed in accordance with the noise and vibration management safeguards and mitigation measures outlined in the project REF. This would include notification of residences potentially affected by vibration by letterbox drop for all occupied buildings within 100 metres of the former bowling club site.

Operation

No impacts would occur during operation.

6.1.3 Safeguards and management measures

The impacts of the proposed modification would be adequately managed through implementation of the safeguards and management measures for noise and vibration included in the submissions report.

6.2 Waste management

6.2.1 Potential Impacts

A description of waste management for the project is included in section 6.11 of the project REF.

Construction

The project REF identified the need for demolition of some of the existing structures on the former bowling club site. The proposed modification includes demolition and removal of the former clubhouse building and other infrastructure on the site. The proposed modification would result in the generation of an additional small amount of demolition waste material. The following potential waste streams would be generated from demolition of the former clubhouse building and other infrastructure at the former bowling club site:

- packaging and general waste from staff (eg lunch packaging, portable toilets)
- waste water from bunded areas
- redundant erosion and sediment controls
- demolition waste such as concrete, steel, asphalt and electrical material from the removal of the existing bridge and sections of highway
- building demolition waste including concrete, bricks, steel, treated timber and asbestos containing material , from the demolition of the motel, private residence and other smaller structures
- topsoil and grass from stripping of the bowling greens, which would be re-used on the project if possible.

The proposed modification would remove asbestos containing material within the former clubhouse building and other infrastructure. An asbestos audit and risk assessment report, including an asbestos register, has been undertaken for the former clubhouse building (South Coast Asbestos Consulting, 2017). Asbestos containing material has been identified in areas of the existing building, irrigation hatch covers and bowling green gutters. Given the past use of asbestos containing material at the site, there is also a risk that such material occurs in fill historically used at the site.

There is also potential for other hazardous materials (such paint containing lead or other hazardous metallic pigments, treated timbers and polychlorinated biphenyls) to be present, which may restrict opportunities for reuse or disposal.

Further investigations would be carried out to assess the risk of asbestos in soils and other hazardous chemicals and materials at the site.

The general approach to the hierarchy of waste management for the project is in accordance with the NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA, 2014). All waste materials generated for the proposed modification would be classified in accordance with the NSW EPA Waste Classification Guidelines (2014) and disposed of at an appropriately licenced facility.

As identified in Section 3.3.2 of the project REF, demolition works for the project would be undertaken in compliance with Australian Standard AS2601: The Demolition of Structures and that any asbestos containing material would be managed and removed by an appropriately licenced contractor before disposal at a licenced facility. Demolition for the proposed modification would similarly be undertaken in compliance with AS2601.

Demolition that would involve disturbance of asbestos containing material would be undertaken by a licenced asbestos removal contractor in accordance with the *Work Health and Safety Act 2011* and associated regulations. Asbestos containing material would be disposed of at a facility appropriately licenced for this waste.

At its meeting on 12 June 2018, Eurobodalla Shire Council resolved that the demolition of the former clubhouse building be undertaken in a manner that makes all reasonable attempts to reuse and recycle materials (refer section 5.2). Where possible, all reasonable attempts would be made to reuse and recycle materials as identified by Council and in accordance with the hierarchy of waste management.

The nature and scale of waste management impacts are consistent with the project REF and would be managed in accordance with appropriate waste management safeguards and mitigation measures.

Operation

No impacts would occur during operation.

6.2.2 Safeguards and management measures

The impacts of the proposed modification would be managed through the implementation of the waste safeguards and management measures identified in the submissions report.

6.3 Soil and water quality

6.3.1 Existing environment

A summary of the existing soil and water quality environment is included in section 6.4.2 of the project REF.

The former bowling club site is located adjacent to coastal wetlands comprising mangrove forest and is about 100 metres from Mcleods Creek. The site is located within a high risk area for acid sulfate soils.

6.3.2 Potential impacts

Construction

Potential water quality impacts are identified in section 6.4.3 of the project REF and section 4.8.4 of the submissions report. Potential impacts from the proposed modification during construction include erosion and sedimentation, spills and leaks of fuel, oils and other chemicals, acid sulfate soils and contaminated soils.

As described in section 2.3.8 of the submissions report, in order to manage runoff from the site, management measures including erosion and sediment controls (such as bunding) would be implemented at the former bowling club site, including at the boundaries adjacent to wetland areas. The controls at the boundaries adjacent to wetland areas would be implemented and maintained for the duration of use of the ancillary facility during construction. Erosion and sediment controls would be developed following the guidelines of Managing Urban Stormwater: Soils & Construction – Volume 1 (Landcom, 2004) and Volumes 2A - 2E (DECC, 2008) (the 'Blue Book 1 and 2').

As the proposed modification would involve work near wetland areas, there would be potential for water pollution due to hydrocarbon leaks or spills from vehicles or equipment used in the construction phase. The incorrect storage of fuel, oils and other chemicals could also result in impacts on water quality. The proposed modification would enable the layout of the ancillary facility to be optimised to allow for a safer work environment due to a less constrained site with improved access. Optimisation of the site layout would also enable better separation of higher risk activities, such as storage of fuels, chemicals and liquids, from adjacent wetland areas.

As identified in the project REF (refer Figure 6-5), the former bowling club site is mapped as having a high probability of the presence of acid sulfate soils. Further soil sampling would be carried out to determine the presence, extent and strength of acid sulfate soils. Surface excavation required for the proposed modification could expose acid sulfate soils, with potential for acidification. If encountered, extracted material containing acid sulfate soils would be stored and treated (as required) in fully bunded stockpiles to prevent surface water run-off, consistent with the submissions report.

Phase 1 contamination investigations undertaken for the project REF (section 6.4.2) did not identify potential for contamination at the former bowling club site. However, further investigation would be undertaken to confirm site conditions and determine the presence of any contaminated soils. Should any contaminated soil or be encountered prior to or during demolition, potential impacts would be minimised through the implementation of the measures outlined in the submissions report.

Operation

No impacts would occur during operation.

6.3.3 Safeguards and mitigation measures

The impacts of the proposed modification would be managed through the implementation of the soil and water quality safeguards and management measures identified in the submissions report.

6.4 Other impacts

6.4.1 Existing environment and potential impacts

A description of other impacts relevant to the proposed modification is included below.

Environmental factor	Existing environment	Potential impacts
Landscape character and visual impact	A summary of the existing landscape character and visual impact environment is included in section 6.1.2 of the project REF. The former bowling club site is located within landscape character zone I. The project REF assessed the level of sensitivity of this zone as moderate due to its introverted natures that makes its less susceptible to change.	Potential impacts on landscape character and visual are included in section 6.1.3 of the project REF and section 4.8.1 of the submissions report. Visual impacts during construction of the proposed modification would be experienced due to the demolition of the existing building and other infrastructure, the presence of plant and equipment and use as an ancillary facility during construction of the overall proposal. These impacts would be present and visible throughout construction but would be temporary in nature. Safeguards and management measures consistent with the submissions report would be implemented to minimise any visual impacts during construction. During operation the former bowling club site would be returned to Eurobodalla Shire Council as a clear and level site with minimal ongoing maintenance to allow for flexibility for future land use options. This would potentially provide a positive visual impact from the proposed modification.
Biodiversity	A summary of the existing environment is included in section 6.2.2 of the project REF. A supplementary biodiversity assessment was carried out for the northern part of the study area and presented in the submissions report. The proposed modification is located within the proximity area for coastal wetlands mapped under the Coastal Management SEPP (refer section 4.1.1). The coastal wetlands are part of the lower reaches of Mcleods Creek and features estuarine mangrove forests, saltmarsh, seagrass meadows and intertidal mudflats. The coastal wetlands provide suitable habitat for some threatened species including microbats and shorebirds.	Potential impacts on biodiversity are included in section 6.2.3 of the project REF and section 4.8.2 of the submissions report. No vegetation occurs on the former bowling club site and no clearing is required for the proposed modification. The proposed modification would involve land-based works in areas adjacent to aquatic environments during construction. There would therefore be potential for water pollution, for example due to erosion, sedimentation and hydrocarbon leaks or spills from vehicles or equipment used in the construction phase. As described in section 2.3.8 of the submissions report, management measures including erosion and sediment controls (such as bunding) would be implemented at the former bowling club site, including at the boundaries adjacent to wetland areas to manage runoff from the site. The controls at the boundaries adjacent to wetland areas would be implemented and maintained for the duration of use of the ancillary facility.

Environmental factor	Existing environment	Potential impacts
		Surface excavation required for the proposed modification could expose acid sulfate soils, with potential for acidification. If encountered, extracted material containing acid sulfate soils would be stored and treated (as required) in fully bunded stockpiles to prevent surface water run-off, consistent with the submissions report. The proposed modification would result in a minor increase in noise and vibration through plant and machinery operation and increased movements of vehicles, machinery and people. However, the demolition period would be for approximately two months so these impacts would be temporary in nature. The increase may cause some fauna species to temporarily or permanently vacate the study area. All potential construction impacts would be minimised through implementation of mitigation measures outlined in the submissions report. No impacts would occur during operation. The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required. The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.
Traffic and transport	A summary of the existing traffic and transport environment is included in section 6.7.2 of the project REF.	Potential traffic and transport impacts are included in section 6.7.3 of the project REF. During the construction period the proposed modification would have a reduced impact on public parking and local traffic. The proposed modification would provide additional space at the ancillary facility and would allow for additional parking within the site for project staff. This would reduce the need for staff use of public parking. No impacts would occur during operation.
Socio-economic	A summary of the existing socio-economic environment is included in section 6.9.2 of the project REF.	The former bowling club site has been disused for approximately five years. At the end of the construction period a clear and level site would be returned to Eurobodalla Shire Council with minimal ongoing maintenance issues and flexibility for future land use options. The proposed modification would also provide benefits in terms of parking. Parking was identified as an issue in section 6.9.3 of the project REF and the proposed modification would put less demand on public parking through the provision of additional on-site parking. During operation the former bowling club site would be returned to Council as a clear and level site with minimal ongoing maintenance issues and flexibility for future land use options.

Environmental factor	Existing environment	Potential impacts
Air quality	A summary of the existing air quality environment is included in section 6.12.2 of the project REF. The proposed modification remains consistent with the project REF.	Potential impacts of the project on air quality are included in section 6.12.3 of the project REF. The proposed modification includes demolition of the former clubhouse building and other infrastructure, as opposed to only some of the existing structures. This would result in a slightly longer demolition period and an increase in the period of potential dust emissions works. However such impacts would be short term and would be managed with the implementation of standard dust control measures that are consistent with the safeguards and mitigation measures outlined in the submissions report. No impacts would occur during operation.

6.4.2 Safeguards and management measures

Safeguards and management measures for other impacts would be consistent with the submissions report.

7. Environmental management

7.1 Environmental management plans

Safeguards and management measures to minimise adverse environmental impacts from the Batemans Bay Bridge replacement project were identified in the submissions report. These safeguards and management measures are adequate to manage the risks and potential impacts identified for the proposed modification. Therefore no additional safeguards or management measures are required to minimise potential adverse environmental impacts which could arise as a result of the proposed modification.

Should the proposed modification proceed, the management measures outlined in the submissions report would be incorporated into the Project Environmental Management Plan (PEMP) and CEMP and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Safeguards and management measures that would be required to avoid or reduce environmental impacts from the Batemans Bay Bridge replacement project were identified in section 6.2 of the submissions report and are summarised in Table 7-1 below. These safeguards and management measures are adequate to manage the risks and potential impacts identified for the proposed modification. These safeguards and management measures would be incorporated into the detailed design phase of the proposed modification, the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. The safeguards and management measures would minimise any potential adverse impacts on the surrounding environment arising from the proposed modification.

Table 7-1: Summary of environmental safeguards and management measures

Impact	ID	Environmental safeguards	Responsibility	Timing
General - minimise environmental impacts during construction	GEN1	A CEMP would be prepared in consultation with relevant government agencies and submitted for review and endorsement of the Roads and Maritime Representative prior to commencement of the activity. As a minimum, the CEMP would address the following: • any requirements associated with statutory approvals • details of how the project would implement the identified safeguards outlined in the REF and EIS • 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 • a Demolition Management Plan for the existing bridge removal to address sequencing, contamination and safety issues. The endorsed CEMP would be implemented during the undertaking of the activity.	Contractor / Roads and Maritime	Detailed design Pre-construction Construction
General - notification	GEN2	All businesses, residents and other key stakeholders (eg schools, local councils) affected by the activity would be notified at least five days prior to commencement of the activity.	Contractor	Pre-construction Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
General – environmental awareness	GEN3	All personnel working on site would receive training to ensure awareness of environment protection requirements to be implemented during the project. This would include up-front site induction and regular "toolbox" style briefings. Site-specific training would be provided to personnel engaged in activities or areas of higher risk. These include: • working in and near waterways • construction noise management • areas of Aboriginal heritage sensitivity • threatened species habitat • threatened ecological communities • SEPP 14 wetlands	Contractor	Pre-construction Construction
Landscape character and visual impact				

General	LC1	An Urban Design and Landscape Plan (UDLP) will be prepared to support the final detailed project design and implemented as part of the CEMP. The UDLP will 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 UDLP will include:
		• proposed revegetation plan that will include:
		  • species to be used
		  • screening of infrastructure where required and practical
		  • minimising the impacts of headlight glare on surrounding residents
		  • planting of foreshore areas to be to be determined in consultation with Council.
		  • procedures for monitoring and maintaining landscaped or rehabilitated areas.
		• design treatments for:
		  • built elements including retaining walls and the bridge and consider application of crime prevention through environmental design strategies
		  • pedestrian and cyclist elements including shared use path locations, paving types and pedestrian crossings
		  • fixtures such as seating, lighting, fencing and signs
		  • details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage.
		The UDLP will be prepared in accordance with relevant guidelines, including:
		• Beyond the Pavement urban design policy, process and principles (Roads and Maritime 2014c)
		• Landscape Guideline (RTA 2008)
			Contractor	Detailed design
				Pre-construction
				Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
		• Bridge Aesthetics (Roads and Maritime 2012c) • Shotcrete Design Guideline (RTA 2005c).		
Integration of earthworks design with existing landform	LC2	The potential visual impact of the earthworks will be minimised by careful design that integrates with adjoining landforms. This could be achieved through rounding of the top of cut batters, tailing off of cut batters and a gradual flattening of grades at ends of fill embankments in order to avoid sharp transitions at ends.	Contractor	Detailed design Construction
Integration of earthworks design with existing landform	LC3	Retaining walls will be constructed to minimise the construction footprint and removal of existing vegetation, where possible. Consideration will be given to screen planting below walls and the use of visually recessive materials in order to minimise the visual dominance of retaining walls.	Contractor	Construction
Retention of existing vegetation	LC4	The proposal will be designed to avoid impact to prominent trees and vegetation communities where possible. Water quality structures and drainage lines will be designed to avoid existing vegetation where possible.	Contractor	Detailed design
Biodiversity				
Biodiversity – general	B1	A Biodiversity Management Plan will be prepared as part of the CEMP and implemented throughout construction.	Contractor	Pre-construction Construction
Biodiversity – general	B2	Roads and Maritime will determine and implement a suitable offset for impacts to key fish habitat and Illawarra and south coast lowland forest and woodland critically endangered ecological community in accordance with the Guideline for Biodiversity Offsets (Roads and Maritime 2016) and the DPI's Policy and guidelines for fish habitat conservation and management (DPI 2013), in consultation with DPI (Fisheries) and OEH.	Roads and Maritime	Detailed design
Removal of native vegetation	B3	Measures to minimise clearing of native vegetation within the proposal area, including marine vegetation, will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design Construction
Flora and flora management guidelines	B4	Biodiversity management and mitigation will be undertaken in accordance with the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and the associated guides and procedures.	Contractor	Pre-construction Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Loss of potential microbat roosts on existing bridge	B5	The whole of the existing bridge will be inspected for signs of roosting microbats by an ecologist prior to its demolition. Should any roosting microbats, or signs of them, be identified, a Microbat Management Plan will be prepared and implemented.	Contractor	Construction
Changes to hydrological regimes	B6	The new bridge piers and drainage structures associated with the new road alignment will be located and designed to maintain or improve existing hydrological regimes as far as possible. Particular care should be taken to avoid or minimise additional scour of the extensive sandbar downstream of the existing bridge.	Contractor	Detailed design
Turbidity, sedimentation and erosion	B7	The extent of instream works will be kept to the minimum necessary for the proposal, and all instream works will be undertaken in a manner that reduces potential for increased turbidity (ie that minimises disturbance to and mobilisation of instream substrates, including potential acid sulfate soils).	Contractor	Construction
Turbidity, sedimentation and erosion	B8	Bridge piles will be constructed using a system that minimises mobilisation of sediments, including acid sulfate soils.	Contractor	Construction
Increased light	B9	Measures to minimise light spill into the waterway and vegetated areas from the new bridge and approaches will be considered during detailed design.	Contractor	Detailed design
Ancillary facilities	B10	The Korners Park ancillary facility boundary would be screened to reduce visual disturbance to threatened shorebirds from movements of vehicles, machinery and people.	Contractor	Construction
Disturbance to aquatic habitats	B11	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and section 3.3.2 Standard precautions and management measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (DPI (Fisheries NSW) 2013).	Contractor	Construction
Aquatic pests and diseases	B12	All machinery and vessels used during construction are to be verified as clean and free of potential weeds, pests and pathogens prior to arrival to site. Procedures to prevent the introduction or spread of aquatic pests, diseases and saltwater weeds will be developed in consultation with DPI Aquatic Biosecurity and implemented during construction.	Contractor	Construction
Impacts to fish	B13	Fisheries NSW is to be immediately notified of any fish kills in the vicinity of the works.	Contractor	Construction
Hydrology and coastal processes				

Impact	ID	Environmental safeguards	Responsibility	Timing
General construction impacts	H1	Temporary drainage structures will be constructed in accordance with the Technical Guideline – Temporary Stormwater Drainage for Road Construction (Roads and Maritime 2011c).	Contractor	Construction
Stormwater	H2	Additional or alternative ancillary facilities sites will meet the following site assessment criteria, where possible: • operational during a flood event and avoid or minimise impacts to surrounding properties • more than 40 metres from a watercourse • more than 50 metres from residential dwellings • in previously disturbed areas that do not require the clearing of native vegetation • in plain view of the public to deter theft and illegal dumping • outside the drip line of trees • on relatively level ground • away from areas of heritage conservation value. Where additional or alternative ancillary facilities do not meet all of the above criteria, additional relevant controls and assessment (where relevant) will be identified and implemented in consultation with the Roads and Maritime Senior Environment Officer.	Contractor	Construction
Flooding	H3	Further operational flood modelling will be undertaken during detailed design to confirm that afflux, flood extent and scour are equivalent to or better than assessed in the REF.	Contractor	Detailed design
Flooding	H4	As part of the CEMP, a Flood Risk Management Plan will be prepared that details the processes for monitoring and mitigating flood risk. The plan will specify the steps to be taken in the event of a flood warning, including removal or securing of loose material, equipment, fuels and chemicals.	Contractor	Pre-construction Construction
Flooding	H5	Further modelling of the one per cent AEP flood event will be carried out for the construction phase of the proposal. This is to consider the cumulative impact of the existing and new bridges and temporary jetties in the Clyde River. Where required, appropriate mitigation will be implemented to avoid any newly flooded properties, buildings or additional flooding to flood evacuation routes.	Contractor	Detailed design
Scour	H6	A bathymetric survey will be undertaken one to two years after removal of the existing bridge, during normal weather conditions. Survey data will be provided to DPI (Fisheries) for information.	Roads and Maritime	Operation
Soil and water quality				
Water quality	SW1	A water quality monitoring program would be developed in consultation with relevant government	Contractor	Pre-construction

Impact	ID	Environmental safeguards	Responsibility	Timing
monitoring		agencies and implemented during construction in accordance with Roads and Maritime Guideline for Construction Water Quality Monitoring (Roads and Maritime, 2003).		Construction
Contaminated land	SW2	A Contamination Management Plan will be prepared in accordance with the Guideline for the Management of Contamination (Roads and Maritime, 2013) and implemented during construction. The plan would include, but not be limited to: • capture and management of any contaminated surface runoff • further investigations required to determine the extent, concentration and type of contamination relevant to the proposal, including asbestos, lead and treated timber • remediation and subsequent validation of identified contaminated land, including any certification required • a procedure for the management of unexpected contamination identified during construction • measures to ensure the safety of site personnel, local communities and the environment during construction • Identification of licenced contractor engaged to remove any asbestos containing materials.	Contractor	Pre-construction Construction
Contamination of surface water	SW3	All fuels, chemicals, and liquids stored on land will be stored at least 40 metres away from waterways (including existing stormwater drainage system) and will be stored in a sealed bunded area within the ancillary facility. On barges and jetties, fuels, chemicals and liquids will be stored within a bunded area.	Contractor	Construction
Contamination of surface water	SW4	The refuelling and maintenance of land-based plant and equipment will be undertaken in a designated sealed bunded area at ancillary facilities, where possible. Refuelling of marine based plant and vessels will be undertaken in a suitably bunded area (through use of silt curtain or booms) to minimise risk of spills.	Contractor	Construction
Contamination of surface water	SW5	Vehicle wash downs and concrete washouts will be carried out within designated sealed bunded areas at ancillary facilities, or carried out off-site. All construction water will either be treated to appropriate levels for reuse or discharge or be removed from site to an appropriately licenced facility.	Contractor	Construction
Contamination of surface water	SW6	Regular visual water quality checks (include for turbid plumes and hydrocarbon spills or slicks) will be carried out when working in or near the waterway.	Contractor	Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Accidental spill	SW7	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Roads and Maritime Code of Practice for Water Management (RTA, 1999) and relevant Environment Protection Authority (EPA) guidelines. The plan would address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA).	Contractor	Pre-construction Construction
Accidental spill	SW8	Emergency spill kit would be kept on site at all times. Spill kits will be located at all ancillary facilities and main construction work areas, including barges and temporary jetties. All staff would be made aware of the location of the spill kit and trained in its use	Contractor	Construction
Acid sulfate soils	SW9	An Acid Sulfate Soils Management Plan will be developed as part of the CEMP and implemented during construction. This plan will be prepared in accordance with the Roads and Maritime Guidance for the Management of Acid Sulphate Materials 2005 (RTA 2005a).	Contractor	Pre-construction Construction
Soil and water - general	SW10	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 and water pollution and describe how these risks would be addressed during construction. The SWMP will be reviewed by a soil conservationist on the Roads and Maritime list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy Services.	Contractor	Pre-construction Construction
Construction surface water	SW11	A site specific Erosion and Sediment Control Plan/s will be prepared and implemented as part of the Soil and Water Management Plan. This plan will develop further on the Conceptual Erosion and Sedimentation Management Report located in Appendix F of the REF. Erosion and sediment controls would be developed following the guidelines of the 'Blue Book' (Landcom, 2004 and DECC 2008). The Plan will include: • rock armouring of construction sediment basin outlets • preferential reuse of water in construction sediment basins • a basin dewatering procedure in accordance with Roads and Maritime's Technical Guideline Environmental Management of Construction Site Dewatering (2011) including use of floating siphon devices for dewatering where possible • 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.	Contractor	Pre-construction Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Construction surface water	SW12	Surface water diversions will be installed in accordance with the erosion and sedimentation control plan (ESCP) prior to construction commencing.	Contractor	Pre-construction Construction
Soil and water - general	SW13	A soil conservationist on the Roads and Maritime list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy Services will be engaged and consulted throughout the construction of the overall proposal.	Contractor	Construction
Stormwater runoff	SW14	Operational water quality treatment and quantity will be identified during detailed design in consideration of the Roads and Maritime Water Sensitive Urban Design Guidelines (2017), impacts to SEPP 14 wetlands and the capacity of Council's stormwater systems.	Contractor	Detailed design
Spill containment	SW15	Operational spill containment of a minimum of 20,000 litres will be provided at either end of the bridge to ensure that spills on the new bridge and approaches can be captured before reaching sensitive environments.	Contractor	Detailed design
Rehabilitation	SW16	Progressive rehabilitation will be carried out during construction, whereby rehabilitation will commence as soon as practicable after works are completed in any area.	Contractor	Construction
Groundwater	SW17	Further investigations will be undertaken during detailed design to confirm the depth of groundwater near the overall proposal and any potential impacts. If groundwater impacts are likely, a Groundwater Management Plan will be developed and form part of the CEMP. If required, an approval under the *Water Management Act 2000* will also be obtained following consultation with the DPI Water.	Contractor	Detailed design
Aboriginal heritage				
Aboriginal heritage - general	AH1	An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the Procedure for Aboriginal cultural heritage consultation and investigation (Roads and Maritime, 2012) and implemented as part of the CEMP. The AHMP will include the Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime, 2015). It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP will be prepared in consultation with all registered Aboriginal parties.	Contactor	Pre-construction Construction
AHIP	AH2	An Aboriginal heritage impact permit (AHIP) will be sought for the overall proposal area, including archaeological salvage excavation at sites B Bay Shell 1 and B Bay Shell 2. Salvage excavations will be completed prior to any activities (including pre-construction activities) which may harm Aboriginal objects at these site locations.	Contractor	Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Unexpected finds	AH3	The Unexpected Heritage Items - Heritage Procedure 02 (Roads and Maritime, 2015) will be followed in the event that a potential heritage item is found during construction.	Contactor	Construction
Noise and vibration				
Construction noise and vibration	NV1	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will be prepared in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime 2016) and identify: • all potential significant noise and vibration generating activities associated with the activity • a monitoring program to assess performance against the 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.	Contactor	Pre-construction Construction
Out of hours work	NV2	Out of hours works will be undertaken in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime 2016).	Contractor	Construction
Construction vibration	NV3	Attended vibration monitoring should be undertaken to determine site-specific minimum working distances for structural damage and human response. Site-specific minimum working distances should be determined whenever significant vibration generating plant will be working close to or within the recommended minimum working distances listed in Appendix I of the REF.	Contractor	Pre-construction Construction
Construction vibration	NV4	Further attended vibration monitoring should be conducted whenever significant vibration generating plant items are operating close to or within the determined minimum working distances. Locations for vibration monitoring during particular works would be determined by the construction contractor.	Contractor	Construction
Construction vibration	NV5	Dilapidation surveys will be conducted at all residential and other vibration sensitive receivers within 50 metres of the construction site. Notification of residences potentially affected by vibration by letterbox drop will be carried out for all occupied buildings within 100 metres of the construction site.	Contractor	Pre-construction
Operational noise mitigation	NV6	Operational noise mitigation requirements will be reviewed during detailed design. At-property treatments will be agreed upon and implemented in consultation with property owners	Roads and Maritime	Detailed design

Impact	ID	Environmental safeguards	Responsibility	Timing
Operational noise mitigation	NV7	Where practical operational noise treatments would be implemented at the start of the construction period.	Contractor	Pre-construction
Operational noise	NV8	Post construction noise monitoring will be undertaken in accordance with Noise Criteria Guideline (Roads and Maritime 2016) and Noise Mitigation Guideline (Roads and Maritime 2016) within two to twelve months of proposal completion, at selected representative locations along the proposal route.	Roads and Maritime	Post-construction
Traffic and transport				
Traffic and transport - Construction impacts	T1	A Traffic Management Plan (TMP) will be prepared and implemented for road and marine traffic during construction. The TMP will be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA Specification G10 Control of Traffic (Roads and Maritime, 2008). The TMP will include: • confirmation of haulage routes • measures to maintain access to local roads, properties and the waterway • 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 and the waterway • access to ancillary facility including entry and exit locations and measures to prevent construction vehicles queuing on public roads • a response plan for any construction road or marine 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.	Contractor	Pre-construction Construction
Traffic and transport - Construction impacts	T2	Consultation would be undertaken with all local and regional bus companies that operate in Batemans Bay to confirm any bus diversions and bus stop relocations including at Wharf Road and Clyde Street during construction and any operational road network changes.	Contractor	Pre-construction Construction
Traffic and transport - Construction impacts	T3	Partial road closures (or any short-term full road closures) would be timed to avoid peak periods such as holiday periods when vehicle traffic is high along the highway, where practicable.	Contractor	Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Traffic and transport - Construction impacts	T4	Pedestrian and cyclists connectivity across the construction area would be maintained during construction. The community would be notified of any access changes including alternative routes.	Contractor	Construction
Traffic and transport - Construction impacts	T5	Access to private properties would be maintained during construction, wherever possible. Where changes to access arrangements or disruption to access are necessary, owners and occupiers would be consulted regarding alternative access arrangements.	Contractor	Construction
Traffic and transport - Construction impacts	T6	Traffic control plans would be prepared for the construction area and progressively updated as the works progress. The plans would be prepared and implemented by suitably qualified personnel.	Contractor	Construction
Traffic and transport - Construction impacts	T7	A Road Occupancy Licence would be obtained where required.	Contractor	Construction
Traffic and transport - Construction impacts	T8	Impacts to parking along the northern and southern foreshores of the Clyde River will be minimised during construction where possible. Where impacts are unavoidable, the community will be notified in advance.	Contractor	Construction
Property and land use				
Property acquisition	P1	All property acquisition will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime, 2012) and the *Land Acquisition (Just Terms Compensation) Act 1991*.	Roads and Maritime	Pre-construction Construction
Property acquisition	P2	Property acquisition of Crown Land would be undertaken in accordance with the *Crown Lands Act 1989.*	Roads and Maritime	Pre-construction and construction
Property acquisition	P3	Consultation will be undertaken with the owners of properties to be acquired regarding the potential impacts of the acquisition. Where partial acquisition is required, adjustment methods such as vegetation screening requirements would be discussed.	Roads and Maritime	Pre-construction Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Loss of car parking	P4	Consultation will be carried out with Council and the shopping complex owners to identify alternative parking arrangements to replace car parking lost during construction	Contractor	Pre-construction Construction
Foreshore areas	P5	Consultation will be carried out with Council regarding the rehabilitation and future use of foreshore areas.	Roads and Maritime	Pre-construction Construction
River access	P6	At least one of the two boat ramps within the proposal area will be available to the public at all times. The public will be notified in advance of access restrictions during construction.	Contractor	Construction
Changes to boat moorings	P7	Roads and Maritime will consult with boat owners with moorings that will need to be relocated as a result of construction or operation of the new bridge.	Roads and Maritime	Pre-construction Construction
Rehabilitation of land	P8	Land leased during construction would be reinstated in a manner agreed with the property owner.	Contractor	Operation
Socio economic				
Social impacts	S1	A Community and Stakeholder Engagement Plan will be prepared that details: • management of complaints and enquires • procedures and mechanisms that will be implemented in response to the key social impacts identified for the proposal • procedures and mechanisms that will be used to engage with affected land owners, business owners and the wider community to identify potential access, parking, business visibility and other impacts and develop appropriate management measures • procedures to keep the community informed about construction and any associated changes to conditions (eg detours or lane closures) such as through advertisements in local media and advisory notices or variable message signs.	Contractor	Pre-construction Construction
Foreshore works	S2	Further consultation will be carried out with government agencies, stakeholders and the community regarding the final design of the river foreshore areas.	Contactor	Pre-construction
Businesses	S3	Consultation will be carried out with Council regarding a signage strategy for the proposal.	Contactor	Pre-construction
Non-Aboriginal heritage				

Impact	ID	Environmental safeguards	Responsibility	Timing
Non-Aboriginal heritage - general	NAH1	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage, in particular for the southern Car Ferry Ramp.	Contactor	Pre-construction Construction
Unexpected finds	NAH2	The Unexpected Heritage Items - Heritage Procedure 02 (Roads and Maritime, 2015) will be followed in the event that a potential heritage item is found during construction.	Contactor	Construction
Impacts to local heritage items	NAH3	An archival record will be prepared for the Batemans Bay Bridge and the northern Car Ferry Ramp. All archival recording will be completed in accordance with the Heritage Branch guidelines How to Prepare Archival Records for Heritage Items and Photographic Recording of Heritage Items Using Film or Digital Capture (Heritage Office 2001, revised 2004, 2006).The archival recording will be deposited with the Roads and Maritime Library, NSW Heritage Division Library, Eurobodalla Shire Council Libraries and the NSW State Library.	Roads and Maritime	Pre-construction
Impacts to local heritage items	NAH4	A heritage interpretation strategy will be prepared including an interpretation of archaeological remains should any be uncovered. The interpretation strategy will emphasise and enhance heritage values of the existing bridge such as the commercial, social and economic development of Batemans Bay due to its proximity to the Clyde River.	Contractor	Operation
Heritage awareness	NAH5	The site induction will include details of the kinds of historical relics, structures or deposits which may be encountered during the construction works and the process should unexpected archaeological remains are encountered.	Contractor	Pre-construction Construction
Removal of Batemans Bay Bridge	NAH6	The Office of Environment and Heritage will be provided with written notice at least 14 days prior to the removal of the Batemans Bay Bridge from the Roads and Maritime section 170 Register.	Roads and Maritime	Pre-demolition
Waste management				
Waste management - general	W1	A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: • 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	Contractor	Pre-construction Construction Demolition

Impact	ID	Environmental safeguards	Responsibility	Timing
		• monitoring, record keeping and reporting. The WMP will be prepared taking into account the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (Roads and Maritime, 2014) and relevant Roads and Maritime Waste Fact Sheets.		
Waste management - general	W2	All wastes will be managed and disposed of in accordance with the POEO Act.	Contractor	Construction
Waste management - general	W3	Appropriate portable toilets or pump out facilities will be provided for construction sites workers and sewage will disposed of appropriately and in accordance with relevant legislation.	Contractor	Construction
Waste management - general	W4	Noxious weeds removed during construction will be managed in accordance with Department of Primary Industries requirements and relevant legislation.	Contractor	Construction
Waste management - general	W5	Site inductions will include waste management and disposal requirements and facilities.	Contractor	Construction
Fill material	W6	Excavated material will be reused on-site where feasible and suitable for the intended reuse to reduce demand on resources. Where excavated material cannot be used on site, opportunities for reuse on nearby projects will be investigated.	Contractor	Construction
Fill material	W7	Any additional fill material required will be sourced from appropriately licensed facilities and/or other construction projects wherever possible. Additional fill material will be sourced and verified as suitable for use in accordance with relevant EPA and Roads and Maritime guidelines.	Contractor	Construction
Management of green waste	W8	Where possible and suitable for use, mulch would be used on-site.	Contractor	Construction
Disposal of waste	W9	All waste and excess excavated material will be disposed of at an appropriate licensed facility.	Contractor	Construction
Management of tannins	W10	A tannin leachate management protocol will be developed in consultation with DPI (Fisheries) in accordance with Roads and Maritime' Environmental Direction – Management of Tannins from Vegetation Mulch (Roads and Maritime, 2012) to manage the stockpiling of mulch and use of	Contractor	Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
		cleared vegetation and mulch filters for erosion and sediment control		
Air quality				
General air quality impacts	A1	An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include: • identification of potential risks/impacts due to the work/activities as dust generation activities • management measures to minimise risk of dust generation • a process for monitoring dust on-site • a process for altering management measures as required and reprogramming construction activities if the safeguards and management measures do not adequately restrict dust generation.	Contractor	Pre-construction Construction
Dust emissions	A2	Work will cease when levels of visible airborne dust become excessive.	Contractor	Construction
Dust emissions	A3	Works that disturb vegetation, soil or stockpiles will not be carried out during strong winds (over 40 km/h) when this may affect receivers (visibility on roads dust and debris near recreational areas residences and commercial premises).	Contractor	Construction
Dust emissions	A4	Stockpiled materials will be covered stabilised or stored in areas not subject to high wind.	Contractor	Construction
Dust emissions	A5	All trucks will be covered when transporting material to and from the site.	Contractor	Construction
Climate change and sustainability				
Greenhouse gas emissions	C1	The use of alternative fuels and power sources for construction plant and equipment will be investigated and implemented, where appropriate.	Contractor	Pre-construction
Greenhouse gas emissions	C2	The energy efficiency and related carbon emissions will be considered in the selection of vehicle and plant equipment	Contractor	Pre-construction
Greenhouse gas emissions	C3	Construction equipment, plant and vehicles will be appropriately sized for the task.	Contractor	Construction
Greenhouse gas emissions	C4	Equipment will be serviced frequently to ensure they are operating efficiently.	Contractor	Construction

Impact	ID	Environmental safeguards	Responsibility	Timing
Greenhouse gas emissions	C5	Where possible, materials will be delivered as full loads and local suppliers will be used.	Contractor	Construction
Cumulative impacts				
Cumulative impacts	CU1	Ongoing coordination and consultation will be undertaken between the contractors from the Nelligen and Batemans Bay bridge replacement projects to ensure cumulative traffic impacts are appropriately assessed and managed particularly during peak holiday periods.	Roads and Maritime / Contractor	Detailed design Construction
Cumulative impacts	CU2	The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known.	Contractor	Construction

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for the Batemans Bay Bridge replacement project and when they need to be obtained are included in section 6.3 of the submissions report and listed in Table 7-2 below. No additional or changed licences and approval requirements are required for the proposed modification.

Table 7-2: Summary of licensing and approval required

Instrument	Requirement	Timing
Protection of the Environment Operations Act 1997 (s43)	Environment protection licence (EPL) for scheduled activities being extractive activities from the EPA.	Prior to start of the activity (being the proposal construction)
Fisheries Management Act 1994 (s205)	Permit to harm marine vegetation from the Minister for Primary Industries.	Prior to start of the activity (being work that would impact protected marine vegetation)
National Parks and Wildlife Act 1974 (s90)	Aboriginal heritage impact permit (AHIP) from the Chief Executive of OEH.	Prior to start of the activity (being work that would impact on listed Aboriginal heritage sites)
Heritage Act 1977	Written notification to OEH of removal of heritage items from the Roads and Maritime S170 heritage and conservation register.	Fourteen days prior to removal of the existing Batemans Bay Bridge
Water Management Act 2000 (s90)	Water supply work approval from DPI (Water).	If required, prior to start of the activity (being water supply work)
Water Management Act 2000 (s91F)	Aquifer interference approval from DPI (Water).	If required, prior to start of the activity (being work that would interfere with an aquifer).
Marine Estate Management Act 2014	Marine Parks Permit for work in the Batemans Bay Marine Park.	Prior to start of the activity (being work within the Batemans Marine Park).
Crown Lands Act 1989 (s6)	Licence to occupy areas of Crown land.	Prior to start of the activity

8. Conclusion

8.1 Justification

The proposed modification is consistent with the intent of the project REF and submissions report. The proposed modification would:

- provide additional space to establish an ancillary facility and allow for a safer and more efficient work environment
- provide additional space for parking within the site for project personnel thus reducing the demand on public parking
- facilitate safer vehicle and pedestrian movements within the site including improved turning paths for heavy vehicles, reducing the need for reversing
- separate office space and light vehicle parking from laydown areas
- allocate additional and consolidated space for storage of materials and equipment allowing improved site organisation
- enable better separation of higher risk activities, such as storage of fuels, chemicals, and liquids, from adjacent wetland areas
- reduced frequency and duration of noise associated with reversing heavy vehicles
- eliminate the need for internal building modifications, repairs and ongoing maintenance
- provide a clear and level site to Eurobodalla Shire Council at the end of the project construction period, which would allow flexibility for future land use options.

The impacts of the proposed modification are minor and the safeguards listed in the submissions report would avoid, minimise or mitigate any impacts such that the benefit of the proposed modification would outweigh any potential impacts. As such the proposed modification is considered justified.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposed modification is needed to provide additional space to establish an ancillary facility and allow for a safer work environment for the Batemans Bay Bridge replacement to be built. The project would assist in promoting the social and economic welfare of the wider NSW south coast community. The proposed modification would also not have a substantial impact on the development and conservation of the State's natural and other resources.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development is considered in sections 8.2.1 to 8.2.4 of the project REF. The proposed modification would comply with the principles of ecologically sustainable development.
1.3(c) To promote the orderly and economic use and development of land.	The proposed modification would allow for the ancillary facility to be used in a safe and efficient manner in order to construct the proposed Batemans Bay Bridge replacement project.

Object	Comment
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposed modification.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The proposed modification would not require the removal of any additional vegetation and fauna habitat or threatened ecological communities. Any potential indirect impacts would be managed through the existing environmental safeguards identified in the submissions report.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposed modification would not have the potential to impact on existing cultural heritage.
1.3(g) To promote good design and amenity of the built environment.	At the completion of the project, the proposed modification would consist of a clear and level site with minimal ongoing maintenance issues which would be returned to Eurobodalla Shire Council and allow for flexibility for future land use options.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposed modification.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	At the completion of the project, the proposed modification would consist of a clear and level site with minimal ongoing maintenance issues which would be returned to Eurobodalla Shire Council and allow for flexibility for future land use options.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	The planning of the Batemans Bay Bridge replacement project, which would be supported by the implementation of the proposed modification, has involved extensive consultation with the local community. This included display of the project REF and EIS and publication of the submissions report.

8.2.1 The precautionary principle

A summary of the assessment based on the precautionary principle is included in section 8.2.1 of the project REF. The proposed modification is consistent with this principle.

8.2.2 Intergenerational equity

A summary of the assessment based on intergenerational equality is included in section 8.2.2 of the project REF. The proposed modification is consistent with this assessment.

8.2.3 Conservation of biological diversity and ecological integrity

A summary of the assessment based on conservation of biological diversity and ecological integrity is included in section 8.2.3 of the project REF. The proposed modification is consistent with this assessment.

8.2.4 Improved valuation, pricing and incentive mechanisms

A summary of the assessment based on improved valuation, pricing and incentive mechanisms is included in section 8.2.4 of the project REF. The proposed modification is consistent with this assessment.

8.3 Conclusion

This AREF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration, where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the AREF best meets the project objectives, but would still result in some noise and waste management impacts. Safeguards and management measures as detailed in this AREF would ameliorate or minimise these expected impacts.

The proposed modification would allow for the safer and more efficient operation of the ancillary facility as a result of a less constrained site providing increased storage space and improved access. The proposed modification would also return to Eurobodalla Shire Council a clear and level site with minimal ongoing maintenance issues.

On balance the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF and submissions report and would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Eurobodalla Shire Council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of the Environment and Energy is not required.

9. Certification

This AREF provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.

Alison Tourle
Senior Associate
Advisian
Date: 07/09/2018

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

Shaun Foster
Project Manager / Engineer
Regional Project Office
Date: 10/9/2018

10. References

British Standard (1993). BS 7385 Evaluation and measurement for vibration in buildings Part 2.

DECC (2008) Managing Urban Stormwater V2A-2E

Department of Environment & Climate Change (2009). Interim Construction Noise Guideline.

Department of Urban Affairs and Planning (1996) Roads and Related Facilities EIS Guideline.

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EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

Landcom (2004) Managing Urban Stormwater: Soils & Construction – Volume 1

NSW Environment Protection Authority (2014) Waste Classification Guidelines, Part 1 – Classifying Waste.

Office of Environment and Heritage (2006) Assessing Vibration - a technical guideline.

Renzo Tonin & Associates (2018) Batemans Bay Bridge Replacement Noise and Vibration Assessment for Design Changes.

Renzo Tonin & Associates (2017) Batemans Bay Bridge Replacement Noise and Vibration Assessment.

Roads and Maritime (2016) Construction Noise and Vibration Guideline.

Roads and Maritime (2017) Batemans Bay Bridge replacement review of environmental factors November 2017.

Roads and Maritime (2017) Batemans Bay Bridge replacement environmental impact statement November 2017.

Roads and Maritime (2018) Batemans Bay Bridge replacement review of environmental factors submissions report May 2018.

South Coast Asbestos Consulting (2017) Asbestos Audit & Risk Assessment Report conducted at Batemans Bay Bowling Club, Princes Hwy, Batemans Bay, NSW, January 2017.

11. Terms and acronyms used in this AREF

Term / Acronym	Description
AEP	Annual exceedance probability
AHIP	Aboriginal heritage impact permit
AHMP	Aboriginal Heritage Management Plan
AQMP	Air Quality Management Plan
AREF	Addendum review of environmental factors
BC Act	*Biodiversity Conservation Act 2016* (NSW).
CEMP	Construction environmental management plan
CM Act	*Coastal Management Act 2016* (NSW)
Coastal Management SEPP	State Environmental Planning Policy (Coastal Management) 2018
CNVG	Construction Noise and Vibration Guideline
CNVIS	Construction noise and vibration impact statement
CNVMP	Construction Noise and Vibration Management Plan
CP Act	*Coastal Protection Act 1979* (NSW)
DPI	Department of Primary Industries
DUAP	Department of Urban Affairs and Planning
EIA	Environmental impact assessment
EIS	Environmental impact statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
EPL	Environment protection licence
ESCP	Erosion and sedimentation control plan
Eurobodalla LEP	Eurobodalla Local Environmental Plan 2012
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
MNES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NAHMP	Non-Aboriginal Heritage Management Plan

Term / Acronym	Description
NCA	Noise catchment area
NML	Noise management level
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NVA	Noise and vibration assessment
OEH	Office of Environment and Heritage
PEMP	Project environmental management plan
POEO Act	*Protection of the Environment Operations Act 1997*
REF	Review of environmental factors
Roads and Maritime	NSW Roads and Maritime Services
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP 14	State Environmental Planning Policy No.14 – Coastal Wetlands
SEPP 71	State Environmental Planning Policy No. 71 – Coastal Protection
SWMP	Soil and water management plan
TMP	Traffic management plan
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Roads and Maritime Services.
UDLP	Urban design and landscape plan
WHS	Work Health and Safety
WMP	Waste Management Plan

Appendix A

Not used

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Appendix B

Consideration of clause 228(2) factors and matters of national environmental significance

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Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
a. Any environmental impact on a community? The proposed modification may have impacts on the community from noise generated during demolition. These impacts would be managed through the safeguards listed in Table 7-1. The proposed modification would result in a minor amount of additional demolition waste being generated for the project. These would be managed through safeguards listed in Table 7-1.	Short-term negative
b. Any transformation of a locality? The proposed modification would not substantially transform the locality.	Nil
c. Any environmental impact on the ecosystems of the locality? The proposed modification would not result in the removal of native vegetation.	Nil
d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposed modification may have short term construction noise impacts to sensitive receivers in the locality during demolition. These impacts would be managed through the safeguards listed in Table 7-1.	Short-term negative
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposed modification would have no effects.	Nil
f. Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act* 1974)? The proposed modification would not result in any impacts.	Nil
g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposed modification would not endanger any species.	Nil
h. Any long-term effects on the environment? The proposed modification would not have any long-term negative effects on the community. There are expected to be long term beneficial impacts as the modification would return to Council a clear and level site at the end of the project construction period, with minimal ongoing maintenance issues.	Positive impact
i. Any degradation of the quality of the environment? The proposed modification would not result in any degradation of the environment.	Nil

Factor	Impact
j. Any risk to the safety of the environment? The proposed modification would not pose any significant risk to the safety of the environment with the implementation of the safeguards listed in Table 7-1.	Nil
k. Any reduction in the range of beneficial uses of the environment? The proposed modification would not reduce the range of beneficial uses of the environment.	Nil
l. Any pollution of the environment? There is the potential for construction impacts including erosion and sedimentation and spills and leaks from plant and equipment operating adjacent to aquatic environments and encountering of contaminated soil and acid sulfate soils. These risks would be managed through safeguards listed in Table 7-1.	Short-term negative
m. Any environmental problems associated with the disposal of waste? It is not anticipated that there would be any significant issues encountered with the disposal of waste. Management measures for the recycling of demolition materials, where possible, are provided in Table 7-1.	Nil
n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? All resources required for the modification would not be in short supply and would be readily available.	Nil
o. Any cumulative environmental effect with other existing or likely future activities? The proposed modification would have no cumulative environmental impact.	Nil
p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposed modification would have no impact on coastal processes and coastal hazards.	Nil

Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this AREF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a. Any impact on a World Heritage property?	Nil
b. Any impact on a National Heritage place?	Nil
c. Any impact on a wetland of international importance?	Nil
d. Any impact on a listed threatened species or communities?	Nil
e. Any impacts on listed migratory species?	Nil
f. Any impact on a Commonwealth marine area?	Nil
g. Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

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Appendix C

Statutory consultation checklists

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ISEPP

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
Stormwater	Are the works likely to have a *substantial* impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will *strain* the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a *substantial* impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a *substantial* volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than *minor* or *inconsequential* excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than *minor* or *inconsequential*?	No		ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with local Council(s)	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a *minor* extent?	No		ISEPP cl.15

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	Office of Environment and Heritage	ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	Office of Environment and Heritage	ISEPP cl. 16(2)(b)
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	Yes	Department of Primary Industries (Fisheries) (Batemans Marine Park)	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?	No	Sydney Harbour Foreshore Authority	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	ISEPP cl. 16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	ISEPP cl. 16(2)(h)
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	ISEPP cl. 16(2)(i)

Appendix D

Noise summary report

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Batemans Bay Bridge replacement
Former bowling clubhouse demolition
Noise summary report

Contents

Tables

Figures

Attachments

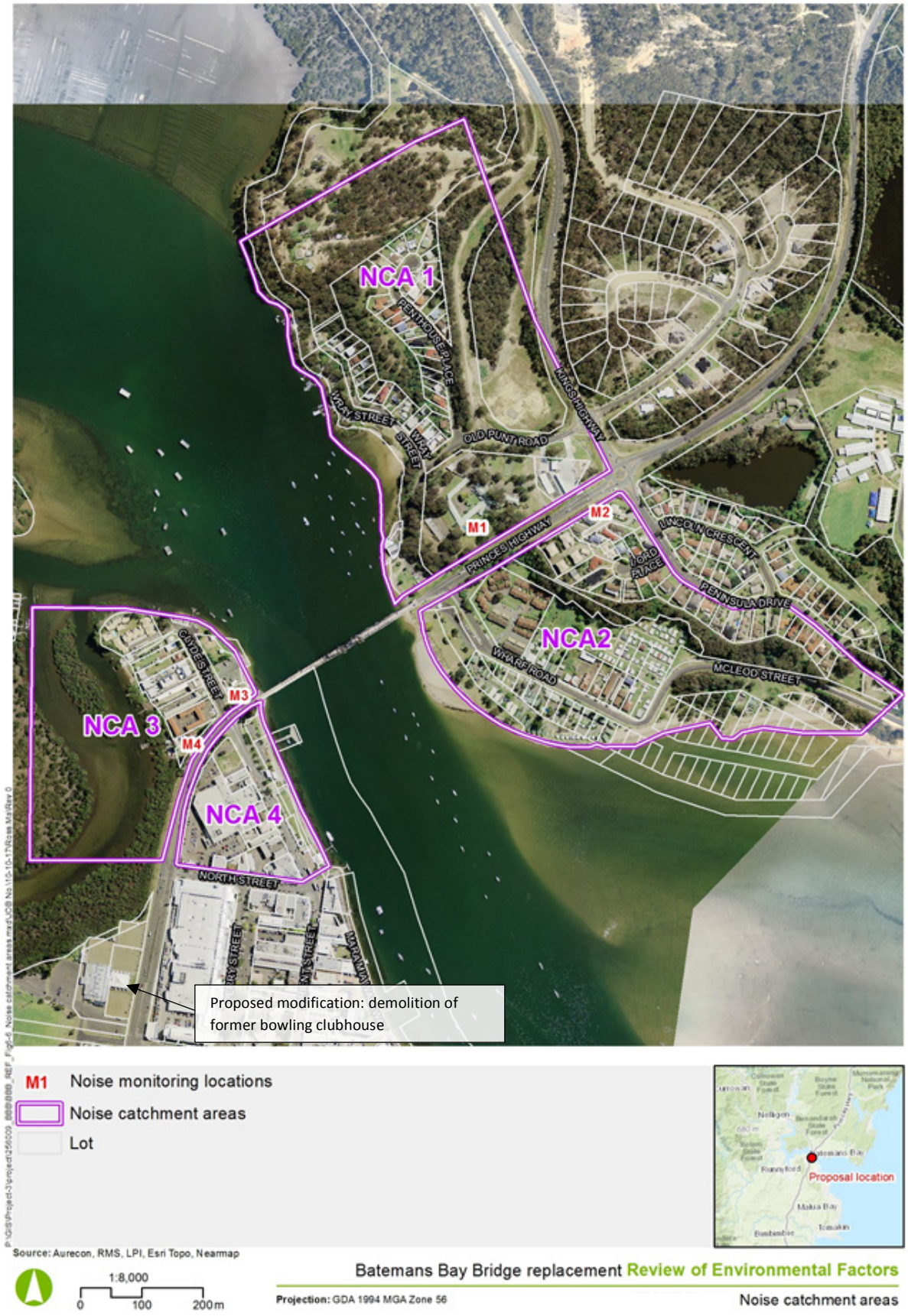
1 Background

Roads and Maritime Services proposes to modify the Batemans Bay Bridge replacement project (the project) to include the demolition and removal of the former clubhouse building and other infrastructure at the former bowling club site at 3 Vesper Street Batemans Bay (proposed modification) to enable the establishment of an ancillary facility. A review of environmental factors (project REF) was prepared in November 2017 to assess the potential impacts of the project. A submissions report was subsequently prepared in May 2018. An addendum REF (AREF) has been prepared to amend the project REF to fully assess the proposed modification.

The project REF included a Noise and Vibration Assessment (NVA) undertaken by Renzo Tonin & Associates (2017) (Appendix I to the project REF). A further NVA was undertaken by Renzo Tonin & Associates (2018) as part of the submissions report to address design changes (Appendix E to the submissions report).

Four Noise Catchment Areas (NCAs) were identified in the NVAs as shown on Figure 1-1 below. The proposed modification is located south of NCA 4. As A further noise assessment has been undertaken to assess the potential noise impacts of the proposed modification.

This noise summary report has been prepared to support the AREF and presents the results of the noise assessment for the proposed modification. The Roads and Maritime Construction Noise Estimator has been used for the assessment and has been applied in accordance with the Construction Noise and Vibration Guideline (CNVG) (Roads and Maritime, 2016).



Source: Batemans Bay Bridge replacement Review of environmental factors (Roads and Maritime Services, November 2017)

Figure 1-1: Project REF noise catchment areas

2 Project description

2.1 Location

The site subject to this noise assessment is the former bowling club site, on the corner of the Princes Highway and Vesper Street in Batemans Bay.

2.2 Construction methodology

The proposed works comprise the demolition of the former clubhouse building and other infrastructure and would include:

- initial 'soft stripping' - manual removal of non-structural elements (including any asbestos containing materials) inside and outside of buildings to facilitate demolition of the structure
- progressive machine demolition of the building and other infrastructure using modified excavators
- sorting and temporary storage of demolition material into recyclable and waste components
- loading and transporting recyclable and waste material to a licenced facility.

As described in the project REF, demolition would be undertaken in compliance with Australian Standard AS2601: The Demolition of structures.

Indicative plant and equipment that would be used for the demolition works and the associated sound power levels (SWL) are listed in Table 2-1. The SWLs have been generally sourced from Table F.1 of the CNVG.

Table 2-1: Noise levels for construction equipment

Plant / equipment	$L_{Aeq(15\ min)}$ SWL (dB(A))
Dump Truck	108
Excavator (tracked) 35 tonne	112
Pneumatic hammer	113
Crusher bucket excavator attachment*	111
Grader	113
Roller (large pad foot)	109
Watercart	107
Cutting tools (including oxy, angle grinders and concrete saws)	118

** SWL obtained from Bucket Crusher Safety and Operations Manual (Genesis, 2018)*

For the purposes of this assessment, the structural demolition scenario in the Construction Noise Estimator was utilised, which has a SWL of 122 dB(A). This SWL would be a 'worst case scenario' and is a based on using the following combination of equipment using the highest allowable noise levels for each piece of equipment, as listed in Table F.1 of Roads and Maritime Construction Noise and Vibration Guideline (2016):

- dump truck - L_{Aeq} SWL = 110 dB(A)
- excavator (tracked) 35t - L_{Aeq} SWL = 110 dB(A)
- as above + hydraulic hammer - L_{Aeq} SWL = 122 dB(A).

2.3 Duration

The demolition works are estimated to take approximately two months. As described in the work methodology outlined in section 2.2, the works would be staged to enable initial soft stripping for the removal of asbestos containing material prior to the use of heavy machinery. As soft stripping works are largely manual, noise impacts from this phase of work would be minimal. Following soft stripping, progressive machine demolition of the building and structures would take place. Machine demolition, along with the crushing and sorting of material into recyclable and waste components, would result in greater noise impacts and are anticipated to extend for up to around six weeks.

2.4 Hours of work

Consistent with the project works, the proposed demolition work would be undertaken during the standard construction hours of:

- Monday to Friday 7 am to 6 pm
- Saturdays 8 am to 1 pm
- No work on Sundays and public holidays.

In accordance with the CNVG, activities with impulsive or tonal noise emissions would only be carried out within the following hours:

- Monday to Friday: 8 am to 5 pm
- Saturday: 9 am to 1 pm
- Sundays and public holidays: no work.

Work with impulsive or tonal noise emissions would be carried out in continuous blocks not exceeding three hours each with a minimum respite of at least one hour between each block.

No out of hours works or night works are anticipated for the modification works.

As described in the project REF, works would be undertaken in accordance with the CNVG and the project Environment Protection Licence (EPL), if required.

2.5 Potentially impacted receivers

The CNVG provides a methodology to identify whether the works would affect many, few or no receivers, based on the 'Affected Distance', which is the distance up to which noise levels are expected to exceed the Noise Management Level and within which receivers may be impacted to different degrees.

The distance based scenario calculation sheet for structural demolition in the Construction Noise Estimator identified the 'Affected Distance' for the modification to be 165 m. The potentially impacted receivers within this distance are shown in Table 2-2. The distances shown in Table 2-2 are the closest distances measured from the edge of the former bowling clubhouse building to the edge of the sensitive receiver sites as shown on Figure 2-1 below. This is a conservative approach as most receivers will actually be situated at a greater distance from the demolition works.

Table 2-2: Potentially Impacted Receivers

Potentially impacted sensitive receivers	Type of receiver	Approximate shortest distance from former bowling clubhouse demolition area (m)
Mackay Park	Active recreation	40
Commercial premises (including Anytime Fitness) on corner of Princes Highway and Beach Road	Commercial/retail	63
Village Centre (shopping centre) – although along Princes Highway frontage is car parking and loading dock areas.	Commercial/retail	65
Batemans Bay Mini Golf	Active recreation	67
IRT The Clyde (retirement village) at 3 Beach Road – four storey residential flat building with retail on ground floor on corner of Beach Road and Perry Street	Residential	90
Batemans Bay Swimming Centre	Active recreation	110
Batemans Bay Visitors Centre	Commercial/retail	120

The potentially impacted receivers in Table 2-2 are classified as 'few' according to the CNVG. Where there are few receivers within the Affected Distance it may be possible to meet with all receivers to discuss the works and any noise impacts during the works.

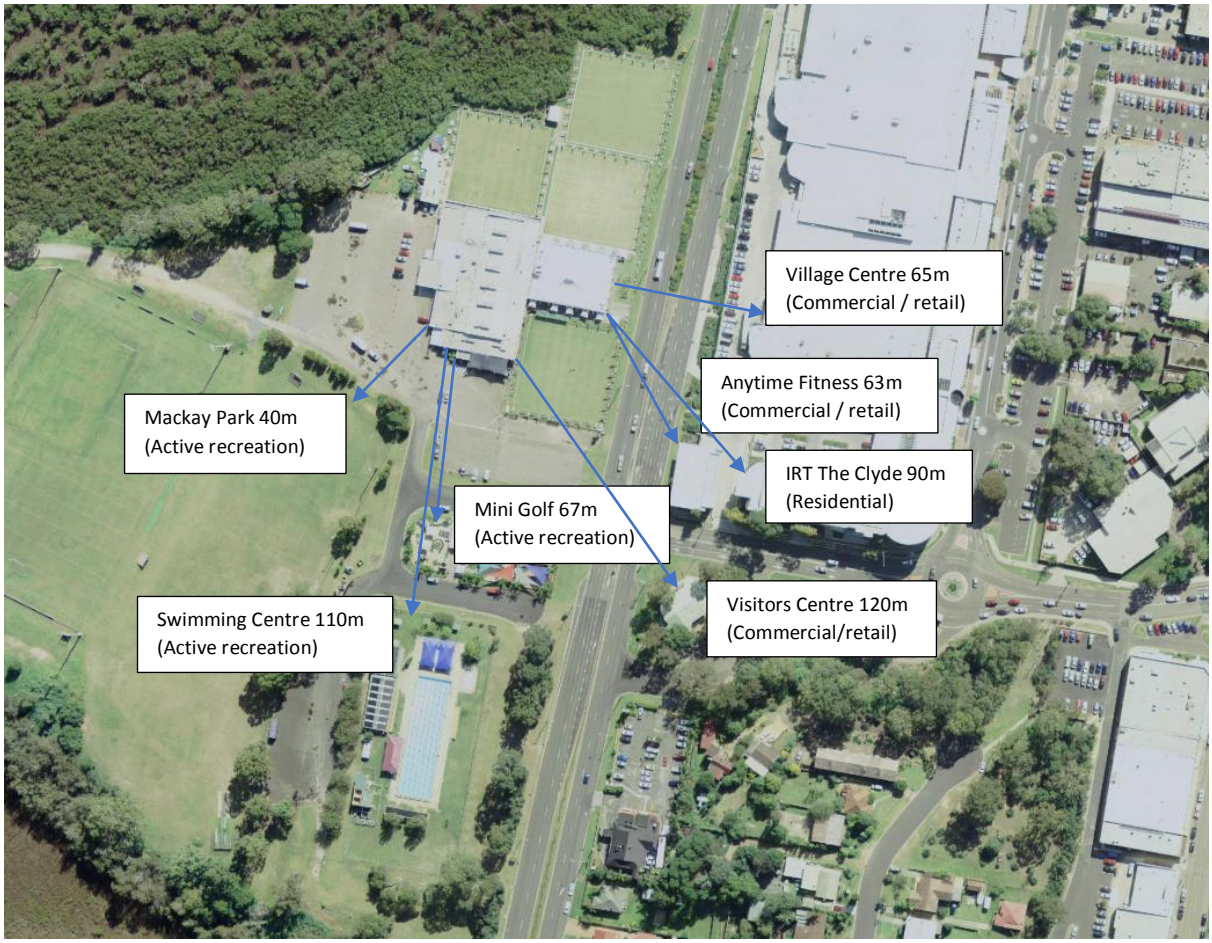


Figure 2-1: Potentially impacted receivers and distances to receivers from the former bowling clubhouse

3 Background noise levels

As identified in the project REF NVA, the closest NCA to the proposed modification is NCA 4, however noise monitoring was not undertaken for NC4 as this area contains commercial premises and noise guideline values for commercial premises are not based on existing noise levels. The closest noise monitoring location for determining background noise levels for the modification is Location M3 at 23 Clyde Street in NCA 3, approximately 460 metres from the proposed modification site (refer Figure 1-1). The background noise levels at this location have been adopted as they are site specific and most closely represent the background noise levels in the vicinity of the proposed modification.

The background noise levels adopted for the modification are shown in Table 3-1 below.

Table 3-1: Background noise levels at M3

L_{A90} Background noise levels (dB(A))		
Day	**Evening**	**Night**
57	46	42

The background noise levels in Table 3-1 are consistent with the typical background noise levels for Urban/Industrial noise environments provided in the CNVG.

4 Noise management levels

The project construction noise management levels (NMLs) (noise affected level) were based on the measured noise levels described in section 3.

For work during standard construction hours:

- the 'noise affected level' (ie the NML) represents the point above which there may be some community reaction to noise. The NML is calculated by adding 10 dB(A) to the background noise level
- the 'highly noise affected level' represents the point above which there may be strong community reaction to noise. The Interim Construction Noise Guideline (ICNG) (DECC, 2009) specifies that the highly noise affected level is 75 dB(A).

For work outside standard construction hours, the NML is calculated by adding 5 dB(A) to the RBL.

Table 4-1 identifies the NMLs for residential receivers adopted for NCA 3 in the project REF.

Table 4-1: Noise management levels at residential receivers in NCA 3

NMLs $L_{Aeq(15min)}$ (dBA)		
Day	**Evening**	**Night**
67	51	47

The NMLs for passive recreation and commercial premises identified in the NVA are provided in Table 4-2 below. Mackay Park, Batemans Bay mini golf and Batemans Bay swimming centre are all considered to be active recreation land uses. The NML for active recreation areas identified in the ICNG has been adopted for this assessment.

Table 4-2: Noise management levels for recreation and commercial land uses

Land use	NML $L_{Aeq(15min)}$ (dBA)
Commercial	70
Passive recreation	60
Active recreation	65

The NMLs in Table 4-2 have been adopted for this assessment and are consistent with those used in the project REF and the Construction Noise Estimator.

5 Predicted noise levels for standard work hours

The assessment process in the CNVG for few receivers and duration of impact works between three to six weeks has been adopted to assess noise impacts for the proposed modification.

The scenario calculation sheet in the Construction Noise Estimator was used to determine the predicted noise levels for standard work hours using the structural demolition scenario (SWL L_{Aeq} of 122 dB(A)). This scenario represents a conservative 'worst case scenario' as discussed previously in section 2.2.

The noise levels predicted using the Construction Noise Estimator for standard work hours are shown in Table 5-1. No out of hours works are proposed for the modification therefore no assessment has been provided for out of hours works. However, if OOHW are required they will be undertaken in accordance with the CNVG and the project EPL. Noise estimator output sheets are included in Attachment 1.

Table 5-1: Predicted noise levels during standard work hours

Sensitive receiver	NML (dB(A))	Predicted noise level $L_{Aeq\ (15\ min)}$ (dB(A))	Level above NML dB(A)
Mackay Park	65	78	13
Commercial premises (including Anytime Fitness) on corner of Princes Highway and Beach Road	70	75	5
Village Centre (shopping centre)	70	74	4
Batemans Bay Mini Golf	65	74	9
IRT The Clyde (retirement village) at 3 Beach Road	67	72	5
Batemans Bay Swimming Centre	65	70	5
Batemans Bay Visitors Centre	70	69	-

Mackay Park, the closest sensitive receiver, is identified as highly noise affected at the closest boundary to the demolition works. However it should be noted that this park extends over a large area and is not in constant use. Council has advised that Mackay Park is mainly used during the football season (March to September) two nights per week for training and every second Sunday for games. This usage would be generally outside of the standard construction hours outlined in section 2.4. Therefore, it is anticipated that impacts on receivers using the park would be minimal and receivers would not generally be exposed to the noise level conservatively predicted at the boundary of the park closest to the demolition works.

The construction impacts presented in Table 5-1 are based on the representative worst-case noise construction scenario assuming all equipment operates concurrently, that there are minimal offset distances between equipment and receivers and no barriers or site hoardings to mitigate noise measures.

The proposed modification is expected to produce noise levels less than those provided in Table 5-1. The Construction Contractor would re-assess the construction noise impacts in accordance with the ICNG and CNVG based on actual construction scenarios, timings, offset distances and equipment developed as part of a construction noise and vibration impact statement (CNVIS). The CNVIS would describe the construction impacts and the necessary noise management and mitigation measures to be implemented in accordance with the Contractor's Construction Noise and Vibration Management Plan (CNVMP).

6 Mitigation measures

Recommended mitigation measures, based on the results of the noise assessment, are provided in the Construction Noise Estimator. The relevant measures for the proposed modification are shown in Table 6-1.

Table 6-1: Mitigation measures

Sensitive receiver	Mitigation measures
Mackay Park	N, V, PC, RO
Commercial premises (including Anytime Fitness) on corner of Princes Highway and Beach Road	N, V, PC, RO
Village Centre (shopping centre)	-
Batemans Bay Mini Golf	-
IRT The Clyde (retirement village) at 3 Beach Road	-
Batemans Bay Swimming Centre	-
Batemans Bay Visitors Centre	-

Notes: N= Notification (letterbox drop or equivalent) *PC = Phone calls*
V = Verification of predicted noise level *RO = Respite offers*

These mitigation measures are consistent with the noise and vibration safeguards and management measures outlined in the project REF submissions report. This would be reconfirmed by the Contractor's noise modelling prior to commencement of works.

Out of hours works would be undertaken in accordance with the CNVG.

The Contractor would be responsible for implementing mitigation measures and managing noise and vibration for the proposed modification. The Contractor's compliance will be managed by Roads and Maritime.

7 Terms and acronyms used in this noise summary report

Term / Acronym	Description
AREF	Addendum review of environmental factors
CEMP	Construction environmental management plan
CNVG	Construction noise and vibration guideline
EPL	Environment Protection Licence
ICNG	Interim construction noise guideline
NCA	Noise catchment areas
NML	Noise Management Level
NVA	Noise and vibration assessment
REF	Review of environmental factors
Roads and Maritime	NSW Roads and Maritime Services

8 References

Department of Environment & Climate Change (2009). Interim Construction Noise Guideline.

Genesis (2018). Bucket Crusher (GBC) Safety and Operator's Manual.

Renzo Tonin & Associates (2017). Batemans Bay Bridge Replacement Noise and Vibration Assessment.

Roads and Maritime (2016). Construction Noise and Vibration Guideline.

Roads and Maritime (2017). Batemans Bay Bridge replacement review of environmental factors.

Attachment 1 Noise estimator output sheets

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Construction Noise Estimator

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Mackay Park, Batemans Bay
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	40

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	40	78

Total SPL $L_{Aeq(15minute)}$ (dBA)	***78***

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

		Residential receiver	*Non-residential receivers*						
			Classroom at schools and other educational institutions	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***21***							
	Day (OOHW)	***21***							
	OOHW Period 1	***32***							
	OOHW Period 2	***36***							
Level above NML (dB(A))	**Standard hours**	***11***	**23**	**13**	**23**	**13**	**18**	**3**	**8**
	Day (OOHW)	***16***	**23**	**13**	**23**	**13**	**18**	**3**	**8**
	OOHW Period 1	***27***		**13**	**23**	**13**	**18**	**3**	**8**
	OOHW Period 2	***31***		**13**	**23**			**3**	**8**
Additional mitigation measures	**Standard Hours**	***N, V***	**N, V, PC, RO**	**N, V, PC, RO**	**N, V, PC, RO**	**N, V, PC, RO**	**N, V, PC, RO**	**N, V, PC, RO**	**N, V, PC, RO**
	Day (OOHW)	***V, N, R1, DR***	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**-**	**N, R1, DR**
	OOHW Period 1	***V, IB, N, R1, DR, PC, SN***		**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**-**	**N, R1, DR**
	OOHW Period 2	***AA, V, IB, N, PC, SN, R2, DR***		**V, N, R2, DR**	**V, IB, N, PC, SN, R2, DR**			**N**	**V, N, R2, DR**

Construction Noise Estimator

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Commercial Premises (Crn Princes Hwy and Beach Rd, Batemans Bay)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	63

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	63	75

Total SPL $L_{Aeq(15minute)}$ (dBA)	***75***

		Residential receiver	*Non-residential receivers*						
			Classroom at schools and other educational institutions	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	*67*	55	65	55	65	60	75	70
	Day (OOHW)	*62*	55	65	55	65	60	75	70
	OOHW Period 1	*51*		65	55	65	60	75	70
	OOHW Period 2	*47*		65	55			75	70
Level above background (dB(A))	**Standard hours**	*18*							
	Day (OOHW)	*18*							
	OOHW Period 1	*29*							
	OOHW Period 2	*33*							
Level above NML (dB(A))	**Standard hours**	*8*	20	10	20	10	15	0	5
	Day (OOHW)	*13*	20	10	20	10	15	0	5
	OOHW Period 1	*24*		10	20	10	15	0	5
	OOHW Period 2	*28*		10	20			0	5
Additional mitigation measures	**Standard Hours**	*-*	N, V, PC, RO	N, V, PC, RO	N, V, PC, RO	N, V, PC, RO	N, V, PC, RO	N, V, PC, RO	N, V, PC, RO
	Day (OOHW)	*N, R1, DR*	V,N, R1, DR	N, R1, DR	V,N, R1, DR	N, R1, DR	V,N, R1, DR	-	N, R1, DR
	OOHW Period 1	*V, N, R1, DR*		N, R1, DR	V,N, R1, DR	N, R1, DR	V,N, R1, DR	-	N, R1, DR
	OOHW Period 2	*AA, V, IB, N, PC, SN, R2, DR*		V, N, R2, DR	V, IB, N, PC, SN, R2, DR			-	V, N, R2, DR

Construction Noise Estimator

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Village Centre (1 Perry Street, Batemans Bay)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	65

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	65	74

Total SPL $L_{Aeq(15minute)}$ (dBA)	***74***

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
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   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
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8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

			Non-residential receivers						
		Residential receiver	*Classroom at schools and other educational institutions*	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***17***							
	Day (OOHW)	***17***							
	OOHW Period 1	***28***							
	OOHW Period 2	***32***							
Level above NML (dB(A))	**Standard hours**	***7***	**19**	**9**	**19**	**9**	**14**		**4**
	Day (OOHW)	***12***	**19**	**9**	**19**	**9**	**14**		**4**
	OOHW Period 1	***23***		**9**	**19**	**9**	**14**		**4**
	OOHW Period 2	***27***		**9**	**19**				**4**
Additional mitigation measures	**Standard Hours**	**-**	**N, V**	**-**	**N, V**	**-**	**N, V**	**-**	**-**
	Day (OOHW)	***N, R1, DR***	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 1	***V, N, R1, DR***		**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 2	***AA, V, IB, N, PC, SN, R2, DR***		**V, N, R2, DR**	**V, IB, N, PC, SN, R2, DR**			**-**	**N**

Construction Noise Estimator

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Batemans Bay Mini Golf (Princes Hwy, Batemans Bay)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	67

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	67	74

Total SPL $L_{Aeq(15minute)}$ (dBA)	***74***

		Residential receiver	*Non-residential receivers*						
			Classroom at schools and other educational institutions	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***17***							
	Day (OOHW)	***17***							
	OOHW Period 1	***28***							
	OOHW Period 2	***32***							
Level above NML (dB(A))	**Standard hours**	***7***	**19**	**9**	**19**	**9**	**14**		**4**
	Day (OOHW)	***12***	**19**	**9**	**19**	**9**	**14**		**4**
	OOHW Period 1	***23***		**9**	**19**	**9**	**14**		**4**
	OOHW Period 2	***27***		**9**	**19**				**4**
Additional mitigation measures	**Standard Hours**	**-**	**N, V**	**-**	**N, V**	**-**	**N, V**	**-**	**-**
	Day (OOHW)	***N, R1, DR***	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 1	***V, N, R1, DR***		**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 2	***AA, V, IB, N, PC, SN, R2, DR***		**V, N, R2, DR**	**V, IB, N, PC, SN, R2, DR**			**-**	**N**

Construction Noise Estimator

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	IRT The Clyde (3 Beach Rd, Batemans Bay)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	90

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	90	72

Total SPL $L_{Aeq(15minute)}$ (dBA)	***72***

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

			Non-residential receivers						
		Residential receiver	*Classroom at schools and other educational institutions*	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***15***							
	Day (OOHW)	***15***							
	OOHW Period 1	***26***							
	OOHW Period 2	***30***							
Level above NML (dB(A))	**Standard hours**	***5***	**17**	**7**	**17**	**7**	**12**		**2**
	Day (OOHW)	***10***	**17**	**7**	**17**	**7**	**12**		**2**
	OOHW Period 1	***21***		**7**	**17**	**7**	**12**		**2**
	OOHW Period 2	***25***		**7**	**17**				**2**
Additional mitigation measures	**Standard Hours**	**-**	**N, V**	**-**	**N, V**	**-**	**N, V**	**-**	**-**
	Day (OOHW)	***N, R1, DR***	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 1	***V, N, R1, DR***		**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 2	***AA, V, IB, N, PC, SN, R2, DR***		**V, N, R2, DR**	**V, IB, N, PC, SN, R2, DR**			**-**	**N**

Construction Noise Estimator

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Batemans Bay Swimming Centre (12 Vesper St, Batemans Bay)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	110

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	110	70

Total SPL $L_{Aeq(15minute)}$ (dBA)	***70***

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
9. Identify and implement standard mitigation measures where feasible and reasonble. Include any shileiding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list.
10. Identify and implement feasible and reasonable additional mitigation measures (see rows 42 to 44).
11. Document a summary report detailing:
   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
   (d) predicted noise levels for each time period.
   (e) sleep disturbance affected distance for night works.
   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

			Non-residential receivers						
		Residential receiver	*Classroom at schools and other educational institutions*	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***13***							
	Day (OOHW)	***13***							
	OOHW Period 1	***24***							
	OOHW Period 2	***28***							
Level above NML (dB(A))	**Standard hours**	***3***	**15**	**5**	**15**	**5**	**10**		**0**
	Day (OOHW)	***8***	**15**	**5**	**15**	**5**	**10**		**0**
	OOHW Period 1	***19***		**5**	**15**	**5**	**10**		**0**
	OOHW Period 2	***23***		**5**	**15**				**0**
Additional mitigation measures	**Standard Hours**	**-**	**N, V**	**-**	**N, V**	**-**	**N, V**	**-**	**-**
	Day (OOHW)	***N, R1, DR***	**V,N, R1, DR**	**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 1	***V, N, R1, DR***		**N, R1, DR**	**V,N, R1, DR**	**N, R1, DR**	**N, R1, DR**	**-**	**-**
	OOHW Period 2	***V, IB, N, PC, SN, R2, DR***		**V, N, R2, DR**	**V, IB, N, PC, SN, R2, DR**			**-**	**-**

Construction Noise Estimator

Steps:
1. Enter project name (cell C9).
2. Enter scenario name (cell C10).
3. Enter receiver address (cell C11).
4. Select area ground type (cell C12) - water, undeveloped green fields (e.g. rural areas with isolated dwellings) or developed settlements (e.g. urban and suburban areas)
5. Select type of background noise level input - Reprentative noise environment (to make assumptions) or user input (where noise monitoring data is available):
   (a) where representative noise environment is selected - select the appropriate noise area category (cell C16). The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
   (b) where user input is selected - enter the measured background noise level for each time period (cells D17 to D19).
6. Enter the representative distance in cell C24.
7. Select scenario from the drop-down list in cells A27.
   (a) is there line of sight to receiver? Select from drop down list in cells F27. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier.
8. Identify the level above background and/or noise mangement level (see rows 36 to 41).
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   (a) project description (including location, duration, hours of work, construction methodology, plant , potentially impacted receivers, etc.).
   (b) background noise levels.
   (c) noise management levels .
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   (f) mitigation measures.
   (g) team member responsible for implementing mitigation measures and managing noise and vibration.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction Noise Estimator should be investigated on a project-by-project

Please input information into yellow cells
Please pick from drop-down list in orange cells

Project name	Batemans Bay Bridge replacment
Scenario name	Bowling Club Demolition
Receiver address	Batemans Bay Visitors Centre (Crn Princes Hwy and Beach Rd)
Select area ground type	Developed settlements (urban and suburban areas)
Select type of background noise level input	User Input

		Representative Noise Environment	User Input
Noise area category			
RBL or L_{A90} Background level (dB(A))	**Day**		57
	Evening		46
	Night		42
$L_{Aeq(15minute)}$ Noise mangement level (dB(A))	**Day**		67
	Day (OOHW)		62
	Evening		51
	Night		47

Representative distance (m)	120

Scenario	SWL L_{Aeq} (dB(A))	Is there line of sight to receiver?	Shielding correction (dB(A))	Distance used in calculation (m)	Contribution SPL (dB(A))
Structural demolition	122	Yes	0	120	69

Total SPL $L_{Aeq(15minute)}$ (dBA)	***69***

		Residential receiver	*Non-residential receivers*						
			Classroom at schools and other educational institutions	*Hospital wards and operating theatres*	*Place of worship*	*Active recreation*	*Passive recreation*	*Industrial premise*	*Offices, retail outlets*
Noise Management Level (dB(A))	**Standard hours**	***67***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	Day (OOHW)	***62***	**55**	**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 1	***51***		**65**	**55**	**65**	**60**	**75**	**70**
	OOHW Period 2	***47***		**65**	**55**			**75**	**70**
Level above background (dB(A))	**Standard hours**	***12***							
	Day (OOHW)	***12***							
	OOHW Period 1	***23***							
	OOHW Period 2	***27***							
Level above NML (dB(A))	**Standard hours**	***2***	**14**	**4**	**14**	**4**	**9**		
	Day (OOHW)	***7***	**14**	**4**	**14**	**4**	**9**		
	OOHW Period 1	***18***		**4**	**14**	**4**	**9**		
	OOHW Period 2	***22***		**4**	**14**				
Additional mitigation measures	**Standard Hours**	**-**	**N, V**	**-**	**N, V**	**-**	**-**	**-**	**-**
	Day (OOHW)	***N, R1, DR***	**N, R1, DR**	**-**	**N, R1, DR**	**-**	**N, R1, DR**	**-**	**-**
	OOHW Period 1	***V, N, R1, DR***		**-**	**N, R1, DR**	**-**	**N, R1, DR**	**-**	**-**
	OOHW Period 2	***V, IB, N, PC, SN, R2, DR***		**N**	**V, N, R2, DR**			**-**	**-**

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