



Australian Government

**BUILDING OUR FUTURE**



Transport for NSW

# Nowra Bridge project

Fact sheet - piling



Aerial view of the Nowra Bridge project and temporary rock platform, looking south – October 2020

To build the new Nowra Bridge we will be piling on land and in the river. Land piling will start in late November 2020 with river piling planned to start in March 2021. Piling is expected to be complete by late 2021, weather permitting.

## **Piling methods**

Piles create a foundation for the bridge by connecting the piers to a layer of solid rock below.

The piling method used depends on the soil or rock type and the load the pile will support. Piles are generally either bored or driven into the ground using cranes, piling rigs, vibrating or drop hammers. On the project, we will be using both steel driven piles and bored piles filled with concrete.

## Bored piles

The northern most pier will be constructed using the bored pile methodology. This method is used as the depth to rock is around 10 metres below the river bed.

Bored piles will involve placing a steel casing, from which the soil and rock within the casing is bored and drilled out and removed. The casing is then filled with reinforced concrete to provide the load capacity for the bridge.

## Driven piles

Driven piles will be required at all other piers across the river, where the depth to rock is up to 60 metres below the riverbed.

Driven piles are built by vibrating and hammering steel casings through the river's sediment layers and into the rock layer deep below the river. These casings will come in two segments of up to 30 metres in length and welded together during the placement operation. Once hammered deep below the riverbed, a portion of the river sediment inside the top segment of the casing will be excavated and replaced with reinforced concrete.

## Next Steps

After construction of the bridge piles, a reinforced concrete pile cap is placed over the group of piles, from which the pier extends up to the bridge deck. Further details on this will be provided as the works progress.

## Working hours

Piling activities will occur during our standard working hours:

- Monday to Friday between 7am and 6pm
- Saturday between 8am and 1pm.

Some piling activities, particularly during hammering of the piles into the rock, may generate high noise greater than 75 dB(A). These activities will only be carried out between:

- Monday to Friday between 8am and 6pm
- Saturday between 8am and 1pm.

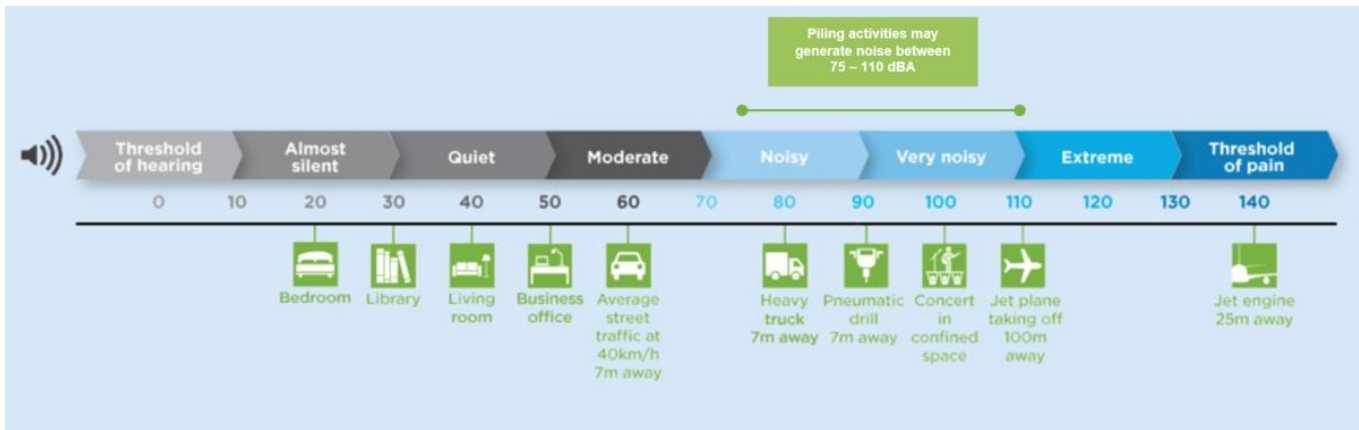
Where higher noise generating (above 85 dB(A)) activities occur, they will occur in blocks of no more than three hours, with at least one hour break before recommencing.

## Noise and vibration impacts

Driven piles involve using a vibrator and impact hammer to push the steel case to the required depth. This activity is continuous, noisy, and vibration will be felt in the surrounding area.

Piling activities may generate noise between 75 and 110 dB(A). When noise above 85 dB(A) is generated, respite periods will be used to provide some relief to neighbours. This will be managed by undertaking these higher noise impacts in blocks of no more than three hours, with at least one hour break before recommencing.

Vibration in the surrounding area will be felt from the energy transmitted through the ground from the piling vibrator and hammer. The level of ground vibration will vary depending on local terrain, geology, groundwater, weather and the distance from the work.



## How we reduce noise and vibration impacts

We will make every effort to minimise impacts and monitoring will be carried out during the work. The project will carry out a number of measures to reduce noise and vibration impacts from piling. These will include:

- carrying out work during approved construction hours
- limiting high impact noise to three continuous hours with at least one hour respite prior to recommencing
- using the best available methods and performance monitoring
- using appropriate machinery to reduce the duration of work
- temporarily closing the northbound bridge footpath during piling.

## Ground vibration

Ground vibration will generally move faster and at a higher frequency in rock compared to soil and reduces in strength as the distance increases from the work. Ground vibration is measured by Peak Particle Velocity (PPV) in millimetres per second (mm/s). Ground vibration is generally considered with respect to two aspects:

- human comfort
- property impact – either structural or cosmetic.

While everyone's perception and tolerance levels are different, the human body is sensitive to small levels of vibration, with most people able to feel vibration levels under 0.5mm/sec.

A common concern is that ground vibration will cause damage to property and structures. Cosmetic damage, such as small hairline cracks, can occur to residential properties or light commercial-type buildings, when the level reaches about 50mm/s. Depending on the structure type and condition, structural damage is not expected until vibration levels exceed 100mm/s.

Before the start of construction, property condition reports were prepared for all properties expected to receive vibration from the project. These reports are used to assist in considering whether property damage has occurred.

## Monitoring of noise and vibration

Noise monitoring is carried out to assess the impact of construction activities against existing noise levels. This is carried out monthly and for specific activities. Vibration monitoring is carried out when new work starts and throughout the duration of any work that creates vibration. Both noise and vibration monitoring will be carried out for all piling work.

**How does the project team know if noise or vibration levels are exceeded?**

An automatic alert system has been set up on our vibration monitor to alert members of the project team if vibration exceeds a set trigger value. This trigger value is below that at which damage can occur and alerts a member of the project team to closely monitor the activities onsite.

Noise and vibration is monitored to ensure that piling is carried out in accordance with NSW Environment Protection Authority and Transport for NSW procedures and guidelines.

**If there is an exceedance of noise or vibration, the following measures will be implemented:**

Additional noise monitoring may be carried out at sensitive receivers to determine if the actual construction

noise generated exceeds the predicted 'worst case' construction noise levels identified in the plan

Noise monitoring may be carried out for the purpose of refining construction methods or techniques to minimise noise

Ongoing spot checks of noise intensive equipment will be undertaken throughout construction to ensure compliance with manufacturer's specifications.

Where actual noise levels are found to exceed the predicted worst case levels by more than 2 dB(A), the source of excessive noise will be identified and any reasonable and feasible measures available will be implemented to either reduce noise emissions or reduce impacts on residents.



Photograph of crane, piling hammer, piling leader holding a pile in place



Photograph of piling hammer

## Northbound bridge footpath temporary closure

Due to noise associated with piling, the footpath on the northbound bridge will be temporarily closed during work hours with pedestrians and cyclists detoured onto the southbound bridge path. Signage will be in place during the temporary closures.

## Marine exclusion zones

For the safety of workers and river users, there will be marine exclusion zones that will be marked by safety buoys and signage during piling work and pier construction. Access along the Shoalhaven River will be maintained, with at least one navigation span open at all times during river work.

## How you can stay informed about piling and noisy activities

The project informs the community about piling or noisy activities in a number of ways. These include:

- project updates and notification letters
- emails to registered stakeholders
- project website
- one-on-one contact.

### Contact us:

If you would like more information about the Nowra Bridge project, please contact our team:

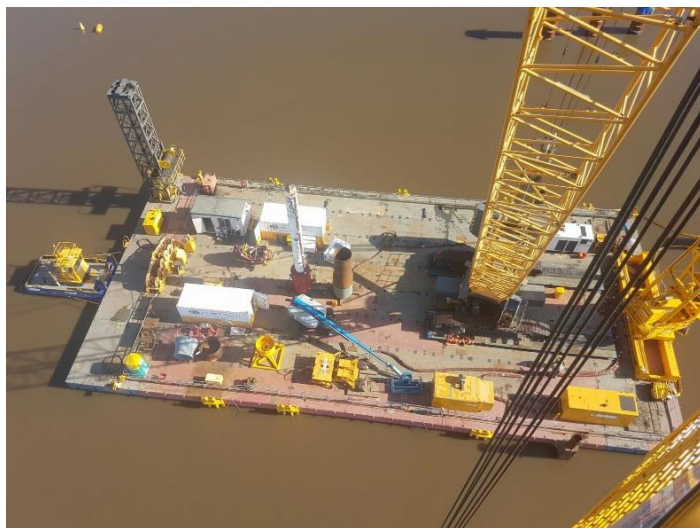
☎ 1800 331 713 (toll free)

@ [NowraBridgeProject@fultonhogan.com.au](mailto:NowraBridgeProject@fultonhogan.com.au)

🌐 [nswroads.work/NowraBridge](http://nswroads.work/NowraBridge)

✉ Nowra Bridge project  
14 Moss Street, Nowra NSW 2541

🏠 Visit our community display centre  
14 Moss Street, Nowra  
Open weekdays 9am – 5pm



Photograph of piling equipment on a barge



Photograph of piling rig on left and crane on right



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