

PACIFIC HIGHWAY UPGRADE
OXLEY HIGHWAY TO KEMPSEY
NOISE & VIBRATION WORKING PAPER

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PREPARED FOR

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8 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

8.1 General description of construction methodology

8.1.1 Hours of operation

Construction would normally be limited to the following hours:

- Between 6am and 6pm Monday to Friday.
- Between 7am and 4pm Saturday.

There would be no works outside these hours, or on Sundays or public holidays, except:

- a) For works that do not cause construction noise to be audible at any sensitive receivers.
- b) For the delivery of materials required outside these hours by the Police or other authorities for safety reasons.
- c) Where work is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.
- d) For any other work as agreed through negotiations between the RTA and potentially affected sensitive receivers. Any such agreement must be recorded in writing and a copy kept on site for the duration of the works.
- e) Where the work is identified in the construction noise and vibration management plan and approved as part of the construction environmental management plan.
- f) As otherwise agreed by the DECCW.

Local residents and the DECCW must be informed of the timing and duration of work approved under items (d) and (e) at least 48 hours before that work commences. Hours of work would be addressed in the construction noise and vibration management plan, which would be finalised in consultation with the Department of Planning and the DECCW.

8.1.2 Temporary infrastructure

In addition to the permanent works for the Proposal, the construction contractor would require temporary access to land for a range of construction related facilities, logistics and activities. Provision of a number of facilities is necessary to plan and manage construction activities with minimal impact to adjacent land use, traffic flows on existing roads and amenity of adjoining residences.

As discussed in Chapter 7 of the *Oxley Highway to Kempsey Upgrading the Pacific Highway Environmental Assessment* (GHD 2010) the locations and types of ancillary facilities would be determined by the construction contractor in accordance with the specified site selection criteria once the staging option (if any) and construction methods are determined. Further sites could be identified during the detailed design and construction phases and would be considered against the specified criteria, which includes noise management.

There would be a number of temporary infrastructure facilities as follows:

- Batch plant sites, primarily concrete production.
- Rock crushing plants.
- Construction compounds.
- Stockpile sites.
- On-site materials processing areas.
- Casting yards for bridge construction.

These temporary facilities are to be provided in a number of areas for construction efficiency and ready access for incoming materials and resources. In this regard, they need to be close enough to the existing road network to provide good transport access but would ideally be remote from residences and sensitive land use areas.

The Environmental Assessment (GHD 2010) identifies a number of potential sites for temporary infrastructure. For the purposes of this construction noise and vibration assessment a number of representative sites have been used to estimate the potential impacts during construction. As stated above, these sites would be refined during the detailed design and construction phases.

Batch plant sites

It is expected that batch plants for concrete and asphalt would be established on site for the bulk supply of fresh concrete for major paving operations. This production would be supplemented by routine concrete deliveries for minor works such as drainage structures.

The batch plant sites would take substantial traffic movements of incoming materials, such as cement, aggregate and sands. They would also require a regular water supply. Importantly, they should be selectively placed along the Proposal to facilitate cost-effective delivery of paving concrete. For the purpose of this assessment, in considering the Proposal length (approximately 37 kilometres) and the desire to limit haulage to a notional 5 kilometre length, this would require batch plants at approximately the 5, 15, 25 and 35 kilometre points. According to possible sites already considered for temporary infrastructure, these are likely to correspond (approximately) to the Maria River State Forest, Kundabung, the Wilsons River and the Hastings River, all in areas of major construction activity due to major cuts, bridge sites and/or highway deviations. These locations would be refined during the detailed design and construction phases.

Rock crushing plant sites

Crushing plants would be required to produce sized aggregates for concrete and asphalt production as well as select road base material. Crushing plants would require adjacent land for stockpiling material. It is desirable for crushing plants to be located in close proximity to the batch plants to provide an efficient supply of material. Rock crushing plants could also include a screening operation depending on the size of materials required for the different components of the construction. The location of the crushing plant sites would be determined by the contractor during construction and could be associated with rock cuttings across the Proposal.

Construction compounds

Additional construction compounds for site offices and amenities, vehicles and stores provisions, as well as security for plant and equipment would be required in numerous locations. It is possible that at least two major compounds would be required for the Proposal and these would be supplemented with localised smaller compounds in some areas.

For the purpose of this assessment sites nominated as potential major construction compounds coincide with the batch plant sites nominated above. The minor compounds would be smaller and focus on more specialist areas of construction. These locations would be refined during the detailed design and construction phases.

Stockpile areas

Stockpile areas are smaller dedicated sites for local short term storage of construction materials such as topsoil, sands, aggregates, stormwater drainage pipes and pre-cast drainage pits. The selection and use of these sites would be the responsibility of the construction contractor in consultation with the RTA. The RTA would establish protocols for conditions of use with respect to access, security, noise and environmental management. These locations would be refined during the detailed design and construction phases.

Onsite materials processing areas

Onsite materials processing is likely to be required if suitable rock materials are identified for processing as select material or for the production of aggregates for concrete batching. Two possible sites have been identified either side of the Cooperabung Hill. One is located between Cooperabung Drive and the proposed alignment approximately 2 kilometres south of Cooperabung Hill and the other one is located on the southern side of Upper Smiths Creek Road approximately 4 kilometres north of the Cooperabung Hill. These locations would be refined during the detailed design and construction phases.

Casting yards for bridge works

There could be dedicated casting yards at the bridge locations crossing both the Wilson and Hastings rivers and road interchanges and traffic arrangements. These locations would be refined during the detailed design and construction phases.

8.2 Background noise levels

In order to assess the potential impact of construction activities the background noise levels at surrounding receivers need to be measured.

8.2.1 Description of rating background level

The existing L_{Aeq} noise level was used to determine appropriate noise criteria for operational noise of the proposed highway. The criteria for construction noise, however, are determined from the background L_{A90} noise levels.

The background noise levels are described by the Rating Background Level (RBL) for day, evening and night. The RBL is used by the NSW Department of Environment Climate Change, and Water (DECCW) and described in their *NSW Industrial Noise Policy* (INP) (EPA 2000). It is a single number description of background noise levels measured over an extended period (normally 1 week). A definition is provided in the glossary in Appendix A.

8.2.2 Assessment areas

During the course of the assessment of operational noise, the existing ambient and background noise level at a number of locations as detailed in Chapter 2 of this report.

In order to simplify the assessment of construction noise, background noise levels have been grouped into two sets corresponding to different sections of the Proposal as shown on Figures 2-1a and 2-2b. Those sections are:

- Combination of both upgrade sections (i.e. 'southern upgrade' and 'northern upgrade' sections) and the 'Hastings River deviation section'.
- The 'Telegraph Point bypass' section.

Combination of both upgrade sections and the Hastings River deviation section

It is assumed that the ambient noise levels at all residences near the existing Pacific Highway are dominated by existing highway traffic. While there is variation at individual properties due to local shielding from other buildings or nearby topography, they mostly fall into a fairly small range.

For ease of reference, the measured RBLs summarised in Table 2-4 from sites within 350 metres of the existing Pacific Highway are reinserted in this section in Table 8-1.

Table 8-1 Summary of measured RBLs from sites within 350m of existing highway

Site	RBL (dB(A))		
	Day	Evening	Night
1	47.2	46.7	46.0
2	43.0	43.0	40.9
5	51.0	46.9	42.8
6	43.3	43.3	42.5
7	47.3	44.8	42.8
8	50.5	45.8	43.0
11	46.5	47.0	41.6
12	49.0	43.5	41.5
13	50.5	43.6	39.9

Two sets of RBLs have been established from the various background noise measurement results summarised in Table 8-1: for residences closer than 500 metres to the existing highway, and those further than 500 metres from the existing highway. The resulting RBLs are shown in Table 8-2.

Table 8-2 Background noise criteria

Residence location	RBL L _{A90} dB(A)		
	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
Residences closer than 500 metres from existing Pacific Highway	45-50	40-45	40
Residences further than 500 metres from existing Pacific Highway	36-40	36-40	36-40

Telegraph Point Bypass section

Monitoring sites 4, 9 and 10 were used to establish background noise levels for the Telegraph Point bypass section. All three sites are located relatively far from the existing highway (i.e. beyond 350 metres from the existing highway) and the measured RBLs from those sites are not likely to be affected by traffic noise.

For ease of reference, the measured RBLs summarised in Table 2-4 from these 3 sites are reinserted in this section in Table 8-3.

Table 8-3 Summary of measured RBLs from sites beyond 350m from existing highway

Site	RBL (dB(A))		
	Day	Evening	Night
4	36	36	36
9	39	39	39
10	36	40	39

The measured RBL noise levels vary between the 3 sites and the lowest levels are conservatively used. RBLs are established at 36 dB(A) during day, evening and night.

When the final construction methodology is developed, the construction noise and vibration management plan would need to include requirements to confirm and possibly revise the rating background levels if needed in areas where residences are potentially most affected by construction works from temporary infrastructure locations.

8.3 Construction noise criteria

8.3.1 General guidelines

Construction noise is assessed with consideration to *Interim Construction Noise Guidelines* (ICNG) (DECC 2009). The ICNG recommend standard hours for construction activity as detailed in Table 8-4.

Table 8-4 ICNG recommended standard hours for construction work

Work type	Recommended standard hours of work
Normal construction	Monday to Friday: 7 am to 6 pm. Saturday: 8 am to 1 pm. No work on Sundays or Public Holidays.
Blasting	Monday to Friday: 9 am to 5 pm. Saturday: 9 am to 1 pm. No work on Sundays or Public Holidays.

The construction hours proposed in Section 8.1.1 (6am to 6pm on weekdays and 7am to 4pm on Saturday) will help in completing the Proposal in a shorter time. This reduced construction time will provide benefits through the reduced duration of exposure to construction noise impacts and improved safety to the travelling public through the earlier opening of the upgrade to traffic.

The ICNG provides noise management levels for construction noise at residential receivers. These management levels are to be calculated based on the adopted rating background level (RBL) at nearby residential locations, as shown in Table 8-5.

Table 8-5 ICNG construction noise criteria at residential receivers

Time period	Management Level $L_{Aeq(15\text{ min})}$
Recommended standard hours	Noise affected level: RBL + 10 Highly noise affected level: 75 dB(A)
Outside recommended standard hours	Noise affected level: RBL + 5

The above levels apply at the boundary of the most affected residences or within 30 metres from the residence where the property boundary is more than 30 metres from the residence.

The *noise affected level* (Table 8-5) represents the point above which there could be some community reaction to noise. Where the *noise affected level* is exceeded all feasible and reasonable work practices to minimise noise should be applied and all potentially impacted residents should be informed of the nature of the works, expected noise levels, duration of works and a method of contact.

The *highly noise affected level* (Table 8-5) represents the point above which there could be strong community reaction to noise and is set at 75 dB(A). Where noise is above this level, the relevant authority could require respite periods by restricting the hours when the subject noisy activities can occur, taking into account:

- Times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for works near residences).
- If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

It should be noted that during the majority of the construction of the Proposal there would be limited fixed or constant construction noise within the road corridor for the whole duration of the Proposal. With the exception of interchanges, bridgeworks and major cuts and fills, the centre of activity would move along the highway as work progresses during the different phases. Most of the activities would occur during recommended standard hours and the suitable noise criterion is that the $L_{Aeq,15min}$ should not exceed the Rating Background Level (RBL) L_{A90} by more than 10 dB(A).

Certain works would be required outside the normal working hours for safety and traffic management reasons. These are likely to be short term in nature and a suitable noise criterion is that the $L_{Aeq,15min}$ should not exceed the Rating Background Level (RBL) L_{A90} by more than 5 dB(A).

Additionally, at night time there is a requirement to try to meet sleep disturbance criteria outlined in the *Environmental Noise Control Manual (EPA 1994)* for the intermittent / impulsive noise at night. The criterion for this type of noise, which applies to maximum noise level (defined as the $L_{A1,1 \text{ minute}}$), is the the Rating Background Level (RBL) + 15 dB(A).

Proposal specific construction noise criteria are shown in Table 8-6.

Table 8-6 Summary of Proposal specific criteria

Location	RBL (dB(A))			L _{Aeq} Criteria (dB(A))			Concrete Batch Plant	L _{A1} Sleep Disturbance Criteria (dB(A))*
	Day	Evening	Night	Day	Evening	Night		
Telegraph Point bypass section	36	36	36	46	41	41	41	51
Hastings River deviation and	Residences closer than 500 metres			55	45	45	50	55

northern and southern upgrade sections	Residences further than 500 metres	36	36	36	46	41	41	41	51
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It should be noted that the criteria are based on the low-end of the background noise range established in Table 8-2 above.

8.3.2 Criteria for construction road traffic noise

There are no specific criteria for assessment of temporary construction road traffic noise. While not strictly applicable, as a guideline, this assessment has considered the criteria from the *Environmental Criteria for Road Traffic Noise* (ECRTN) (Environmental Protection Agency (EPA 1999) relating to new development with the potential to increase traffic noise. Where the base criterion is already exceeded, the ECRTN criterion is that the additional traffic should not increase the existing traffic noise level by more than 2 dB(A).

In general, because of the relatively high existing traffic flow on the Pacific Highway, the predicted increase would be less than 2 dB(A) over the 15 hour day.

8.3.3 Construction guidelines for other potentially impacted receivers

Construction noise criteria at other potentially impacted receivers are shown in Table 8-7.

Table 8-7 ICNG construction noise criteria at other potentially impacted receivers

Time period	Management level ¹ L _{Aeq} (15 min)
Classrooms at schools and other educational facilities	Internal noise level 50 dB(A)
Hospital wards and operating theatres	Internal noise level 40 dB(A)
Places of worship	Internal noise level 45 dB(A)
Active recreational areas (such as sports grounds or playgrounds)	External noise level 65 dB(A)
Passive recreational areas	External noise level 60 dB(A)

¹ Applies when land use is being utilised

8.4 Assessment of noise from construction plant

8.4.1 Construction plant source noise levels

Sound levels of typical equipment are listed in Table 8-8. The table gives both Sound Power Level (SWL) and Sound Pressure Levels (SPL) at 7 metres for the equipment. SWL is independent of measurement position. Verification of plant noise is typically done by measuring the SPL at 7 metres.

Table 8-8 Typical construction plant sound levels

Plant	Sound Power Level (dB(A))	Sound Pressure Level at 7 m (dB(A))
Front end loader	111	86
Grader	107	82
Smooth drum roller	107	82
Spoil, materials or concrete truck	109	84
Tower crane or mobile crane	105	80
Truck-mounted shotcrete pump	106	81
Excavator or bobcat	107	82
Concrete pump	105	80
Concrete vibrator	103	78
Concrete cutter	109	84
Large bored drilling rig	112	87
Small bored drilling rig	108	83
Powered hand tools	109	84
30t excavator operating with hydraulic hammer	122	97
Rock saw	116	91
Water cart	110	85
Kerbing machine	99	74
Chainsaw	106	81
Forklift	106	81
Mulcher	106	81
Articulated dump truck	113	88
Handheld jackhammer	113	88
Air compressor (power tools)	98	73
Asphalt paving plant	114	89
Scraper	119	94

8.4.2 Typical activity noise levels

Based on the above plant, noise level predictions have been conducted for each typical construction phase. These predictions are summarised in Table 8-9.

Table 8-9 Calculation of total sound power level (SWL)

Activity	Typical equipment used	Total SWL used for calculations dB(A)
Site establishment	Excavators, chainsaws, mulching plant and chipper, cranes, generators	110
Removal of corridor vegetation	25t excavator, mulcher, chainsaw, trucks, grader, combination backhoe front end loader	111
Bulk earthworks	Road trucks, compactor, grader, steel, multi tyred and vibratory rollers, concrete pour, including trucks and concrete vibrator, asphalt paving plant, backhoe, sweeper, compressors, generators, (excavator with hammer or blast hole drilling)	114 (120)
Bridge and interchange works	Bored or driven piling rigs, cranes	115 (bored) – 120 (driven)
Milling and paving	Road trucks, compactor, (jackhammers), steel, multi tyred and vibratory rollers, concrete pour, including trucks and concrete vibrator, asphalt paving plant, backhoe, (concrete saw), profiler, sweeper, compressors, generators	113 (116)
Landscaping of exposed areas	Excavator/bobcat, powered hand tools, air compressor, spoil, material or concrete truck, jackhammer (for concrete embedded parts)	109
Crushing plant	Crushing station, dozers, trucks	118

Note: The table shows the typical maximum sound power level predicted for each activity. The figures in brackets are for the use of rock breakers, blast hole drills, jackhammers and concrete saws.

8.4.3 Noise levels at residences

The noise level experienced at any residence along the route would depend upon many factors, such as distance to the construction site, shielding between the site and the residence (i.e. noise levels would be quieter whenever the construction takes place in cut compared with that undertaken on fill), and the nature of the activity occurring at the construction site (i.e. the quietest activities, such as site establishment, would be up to 10 dB(A) quieter than the noisiest activities).

Table 8-10 shows the range of noise levels that could be expected from the different construction activities. These levels are predicted at 30 metres and 150 metres in order to represent the worst case scenario (the closest residence to the highway is located 30 metres away from potential construction works) and the distance where levels would generally start complying with the criteria.

Table 8-10 Predicted noise levels of construction activities

Activity	Total SWL dB(A) used for calculations	Expected SPL (dB(A))
Site establishment	110	64-74 (at 30m) 39-49 (at 150m)
Removal of corridor vegetation	111	65-75 (at 30m) 40-50 (at 150m)
Bulk earthworks	114 (120)	68-78 (at 30m) 43-53 (at 150m) +6 dB(A) when using rockhammer
Drainage works	111	65-75 (at 30m) 40-50 (at 150m)
Bridge and interchange works	115 (bored) – 120 (driven)	69-79 (at 30m) 44-54 (at 150m) +5 dB(A) when driven piles
Milling and paving	113 (116)	67-77 (at 30m) 42-52 (at 150m) +3 dB(A) when using concrete saw
Landscaping of exposed areas	109	63-73 (at 30m) 38-48 (at 150m)

When addressing works associated with the construction of the 'Telegraph Point bypass section', all of the identified activities are generally expected to exceed the day, evening and night criteria at residences located within 150 metres. However, if topographical conditions are favourable (i.e. local topography provides a lot of natural shielding), compliance with the relevant criteria can be expected at the residences located beyond 150 metres from the construction works.

When addressing works associated with the construction of the 'northern' and 'southern upgrade sections', all of the identified activities are generally expected to comply with the daytime criterion at residences located beyond 150 metres. This is the case even when local topography provides no natural shielding. It should be noted that the criteria used for this assessment are conservatively based on the low end of the background noise range established in Table 8-2.

It is important to note that it is typical that as the construction activity moves along the road corridor residences are not exposed to line of sight view of construction plant for an extended period of time. Noise impact is therefore not continuous.

8.5 Assessment of noise from concrete batch plant, crushing plant and compounds

Wilkinson Murray has previously measured noise levels of concrete batch plants. The typical sound power levels of batch plant are as summarised in Table 8-11.

Table 8-11 Typical concrete batch plant sound levels

Plant	Sound Power Level (dB(A))	Sound Pressure Level at 7m (dB(A))
Front end loader	111	86
Concrete batching, including concrete truck	109	84
Trucks unloading into hopper	115	90
Cement bulk tanker unloading	109	84
Conveyor Drive	97	72

The typical overall sound power level of the concrete batch plant would be approximately 113 dB(A).

Wilkinson Murray has previously measured noise levels of crushing plants and the typical overall sound power level would be approximately 115 dB(A).

8.5.1 Noise levels at residences

Predicted noise levels from batch plants, crushing plants and compounds are given in Table 8-12.

Table 8-12 Predicted noise levels from batch plants and compounds

Activity	Expected noise levels from typical activities (dB(A))
Concrete batch plants / major compounds	67-77 (at 30 m) 42-52 (at 150 m)
Crushing plants	69-79 (at 30 m) 44-54 (at 150 m)
Minor compounds	Up to 75 (at 30 m) Up to 49 (at 150 m)

When addressing works associated with the construction of the 'northern' and 'southern upgrade sections', noise generated by batch plants, crushing plants and other compounds are generally expected to comply with the relevant criteria at residences located beyond 150-200 metres. It should be noted that the criteria used for this assessment are conservatively based on the low end of the background noise range established in Table 8-2.

However when addressing works associated with the construction of the 'Telegraph Point bypass section', noise generated by batch plants, crushing plants and other compounds are generally expected to comply with the relevant criteria at residences located beyond 150-200 metres only when local topography provides considerable shielding.

Site selection is important in order to use distance separation and/or natural shielding from local topography. Localised shielding in the form of boundary noise walls could also be beneficial.

As stated earlier in the report, the construction noise and vibration management plan would need to include requirements to confirm and possibly revise the rating background levels if needed in areas near batch plants, crushing plants and other compounds in order to establish more accurate construction noise criteria and refine the noise management measures.

8.6 Assessment of vibration

8.6.1 Vibration criteria

The *Assessing Vibration: A Technical Guideline* (DEC 2006) considers impacts from vibration in terms of effects on building occupants (human comfort) and the effects on the building structure (building damage). The guideline gives "preferred" and "maximum" vibration levels at buildings exposed to continuous and impulsive vibration. For construction vibration the guideline is to apply the criteria for preferred continuous vibration. These levels are summarised in Table 8-13.

In relation to human comfort and building damage from vibration, suitable levels are determined from:

- German Standard *DIN 4150-3: 1999 Structural Vibration – Part 3: Effects of vibration on structures* and British Standard *BSI BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration* (building damage).
- British Standard *BS 6472 – 1992, "Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)* (human comfort).

The limits interpreted from these standards are included in Table 8-13.

Table 8-13 Vibration criteria

Receiver	Human comfort Vibration criteria, maximum peak particle velocity (mm/s)	Building damage Vibration criteria, maximum component peak particle velocity (mm/s)
Residential buildings during daytime	0.28	5
Residential buildings during night time	0.20	5
Offices / Commercials during day	0.56	-
Heritage buildings	n/a	2.5

8.6.2 Source levels of vibration

Table 8-14 provides some estimated vibration levels at a range of distances from the various construction activities.

Table 8-14 Typical vibration generation levels from construction plant

Activity	Peak particle velocity vibration level (mm/s) at distance		
	10 m	20 m	30 m
Concrete sawing	0.5	0.3	0.2
4-Tonne vibratory roller (high)	2.0-2.4	0.4-1.2	0.2-0.8
Hydraulic hammer (30t)	3	1.5	0.4
Impact pile driver	3.3	0.95	0.45

8.6.3 Vibration levels at residences

The typical vibration levels for this Proposal are unlikely to result in levels that cause damage to buildings. It is possible that at some residences close to the Proposal that there would be vibration levels which are perceptible and subject to duration of use could exceed the criteria for human comfort. This is most likely to relate to the use of hydraulic hammer or impact piling within 30 metres of any residence. Some impact could also be expected during use of the vibratory roller within approximately 30-40 metres of any residence. The impacts are expected to be temporary as the construction activity moves away from the residences.

8.7 Construction noise & vibration management

The construction hours proposed in Section 8.1.1 (6am to 6pm on weekdays and 7am to 4pm on Saturday) will help in completing the Proposal in a shorter time. This reduced construction time will provide benefits through the reduced duration of exposure to construction noise impacts and improved safety to the travelling public through the earlier opening of the upgrade to traffic.

The construction noise and vibration management plan to be developed for the Proposal would include procedures to review the proposed construction hours during the construction of the Proposal. Should an unacceptable impact on receivers be confirmed, in relation to the extended working hours, the RTA will revert back to the standard working hours as described in the ICNG and referred to in Section 8.1.1 (7am to 6pm on weekdays and 8am to 1pm on Saturday) in the area of concern for that particular construction activity.

The following management measures would also be adopted to manage any noise and vibration impacts from construction activities:

- Consideration of natural shielding from local topography when selecting sites for temporary infrastructures if feasible and reasonable.
- Placement of noise barriers/mounds around site compounds if feasible and reasonable.
- Specific worker induction (including road truck drivers) would be undertaken prior to any personnel commencing on site.

- Replacement of traditional 'beep beep' reversing alarms with 'smart' alarms where safe.
- Use of modern quietest available and well maintained plant where feasible.
- Noisy works resulting in impulsive and tonal noise which are required to be undertaken outside of standard construction hours would be completed before 10pm or 12midnight when possible.
- Notification of local community would be undertaken prior to the commencement of construction works and periodically throughout the works (i.e. letterbox drop).
- Ongoing consultation with surrounding residences during works.

When the final construction methodology is developed, the and documented in a construction noise and vibration management plan would need to include requirements to confirm and possibly revise the rating background levels if needed in areas where residences are potentially most affected by construction works from temporary infrastructure locations.