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NOISE REPORT

For Proposed Boarding House development at

31 Second Avenue, Kingswood

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1.0 SCOPE OF THIS REPORT

Construction noise is one of the major environmental noise issues in NSW, as it can generate high noise levels. The aim of this report is to determine the predicted noise levels during demolition, construction and in the operational phases of this development to ensure noise is managed appropriately during the construction activities. This report has been prepared to manage construction activities and minimise noise, to protect the majority of residences from noise pollution. Noise levels are important for construction managers as well as neighbouring residences and if not considered, could delay construction work. The development is located at No.31 Second Avenue, Kingswood (Figure 1). Plans have been prepared by AUDAC (Project No. 100119). The neighbouring properties are located approximately 2.65metres from the Western boundary (single storey residential home), approximately 3m from Northern boundary (Garage) and 0.55metres from the Eastern boundary (single storey childcare centre).

2.0 DEMOLITION & CONSTRUCTION NOISE CRITERIA.

All noise assessment to be undertaken in accordance with the Department of Environmental and climate Change NSW under the Protection of the Environmental Operations Act 1997 and occupational noise management provisions of NSW Occupational Health and Safety Regulations 2001.

Recommended standard hours of any work with noise criterion on-site for NSW are below:

Monday to Friday period is between 0700 and 1800 hours

Saturday period is between 0800 and 1300 hours.

2.1 PREDICTED NOISE LEVELS FOR SITE

The parameters for predicting noise impacts need to be clearly identified for noise impacts to be predicted adequately. These parameters are:

- All noise sources related to the proposed construction works
- Location and height of noise sources on-site (hard shale drilling, jack-hammering, use of power saws)
- Type of noise
- Proposed movement alarms on plants and/or vehicles
- Alternative work methods and justification of the selected work methods

Upon approval of construction certificate, demolition of the existing light framed dwelling will take place with an earth moving machine (heavy machinery - 120dBA and debris), truck loader (may use horn - 110dBA) and a few employees (may shout - 90dBA).

During drilling of piles and excavation (heavy machinery - 120dBA) for the basement, which is about 3m below natural ground, this clay site will turn into hard shale at some point. This will then require a diamond cutting machine for rock breaking (124dBA). Forming up for basement slab (using power saw 110dBA) and having concrete mix on trucks (90dBA) with a concrete pump (95dBA) and about 25 workers (85-90dBA).

During the construction of suspended concrete slabs (ground & first floor) about 10-15 (90dBA) workers will be required to frame up the formwork with nail hammering and drilling (120dBA) and saw cutting. Scaffolding construction works will discharge with large hammering equivalent to 100dBA.

Roof framing and metal sheeting will have nail hammering and drilling (90dBA).

2.2 PERMITTED NOISE LEVELS FOR CHILDCARE

Internal noise levels during this whole demolition & construction period for a childcare (No.33-35 Second Ave, Kingswood & operates M-F 6:30am-6:30pm) for sleeping and living must be maintained at 45dBA $L_{Aeq, 1 \text{ hour}}$. A maximum noise reading of 67dBA must be met at the external wall of the childcare to reach this internal noise requirement.

3.0 ACOUSTICAL STUDY

3.1 NOISE SURVEYING DURING DEMOLITION AND CONSTRUCTION PHASE

During demolition and construction phase, we propose to undertake three (3) acoustic testings, one (1) along the Western boundary, one (1) along the Eastern boundary and one (1) inside the childcare. These readings must be conducted on Saturdays, in the absence of the children at the childcare centre.

3.2 ACOUSTIC TESTING MACHINE

Testing will be conducted at 15 minute increments to monitor the noise levels once the acoustic barriers are installed as per instructions. The noise measurements will be taken from an SVAN 957 precision spectrum analyser (or equivalent), which has the following features:

- Noise measurements (SPL, Leq, SEL, Lden, Statistics. TaktMax) with Type 1 accuracy
- Parallel Impulse, Fast and Slow detectors for the measurements with A, C Lin or G filters
- One measurement range 24 dBA - 140dBA in the SLM mode
- 1/1 and 1/3 octave real time analysis parallel to the SLM operation
- FFT Calculation (1920 lines in real time up to 20 kHz)
- Acoustic loudness measurement (optional)
- Tonality function measurement with two 800-line FFT spectra parallel to the SLM operation (optional)
- Reverberation time measurements (optional)
- Internal buffer for logging more than two week of the 1 sec RMS/Spl/Peak results (8, 16, 32 MB non-volatile memory)
- USB 1.1 and RS 232 interfaces
- Built in temperature and static pressure measurements

At the time of these reading, all standard work will be resuming with no notification to workers about these test times. All testings will be checked and verified on the day with the manager on-site, to prevent any neighbours from complaining or getting upset.

After each acoustic barrier walls have been installed and during testing, was found to exceed the permitted noise levels, then it is suggested, mechanical ventilation should be incorporated in the design. If mechanical ventilation noise level is exceeded by 5dBA or higher, than noise source should be identified, such as movement of materials using a bobcat, cutting wood and using electric saw. It must be assessed on a daily basis. A table that may be used for this site focussing on feasible and reasonable work practices in which to minimise construction noise impact is shown below.

Noise source	Is noise loud	Does noise include tones	Does the noise occur at the times that interfere with children sleeping	Is examination of work practises necessary?
Crane	Yes	No	Yes	Yes
Trucks	Yes	Yes - reversing	Yes	Yes
..	..	..	..	..

3.3 PROPOSED OUTCOMES

From the results provided, during demolition and upto the final completion of the works, all machines including trucks, concrete trucks and pumps, must be wholly within the site when in use to keep all noise levels to a minimum at all times. All other waiting vehicles are to be parked at the Chapman Garden Oval to keep noise at a minimum at all times.

Acoustic wall barriers must be continuous to each of the floors to prevent any airflow leaks and ensure that the acoustic barriers are built one (1) meter above the ridge height of the roof to prevent any sound transfers to neighbouring properties.

The $L_{A_{max}}$ was found to be 124dBA.

The noise reduction ANR is $124-67= 67\text{dBA}(57+5)$.

4.0 MATERIAL SPECIFICATION

4.1 RECOMMENDATIONS

- Install and brace timber hoardings along boundaries, to full length of Northern, Western and Eastern sides to a height of RL48.50m AHD (Figure 2). This must be erected before any work commences, to reduce noise from work as soon as possible.
- The contractor must install acoustic barriers along the property boundaries to the affected neighbours and ensure the integrity of the barriers are met at all times until completion of works.
- Acoustic barriers are to consist of 90x45mm timber framed studs, with ten (10) individual sheets of 9mm thick hardboard bolted on one side and one (1) 9mm thick hardboard attached to the other side. This will allow acoustic ratings to be at acceptable levels for all affected parties.
- Major excavations (Cutting into hard shale or rock) and all scaffolding works to be only carried out on Saturdays, when children are not in the childcare centre.

- In addition to managing environmental noise from construction work, contractors and employers must ensure compliance with the occupational noise management provisions of the NSW Occupational Health and Safety Regulations 2001. They must ensure that the assessment method selected is suitable as mentioned in the predicted noise levels.
- Construction noise outside recommended standard hours can be applied if maintenance and repair of public infrastructure or if there is going to be damage to property. Any of these cases will need to be assessed first.
- Forwarding truck movements to avoid engaging reversing alarms
- Vehicle entrance, car park and site office to be located away from residences in particular the childcare centre.
- Limited number of mobile equipment operating near residences
- Noisy fixed plant/s to be located as far as possible from residences
- Site supervisor/manager is to ensure that all sub-contractors/employees are inducted about the above recommendations.

5.0 CONCLUSION

The construction measures stated in our report will comply, provided the measures are implemented substantially during and prior to construction phase.

Should you require further explanations, please don't hesitate to contact us.

Yours faithfully,



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Accredited Certifier – Building Inspector

6.0 APPENDIX

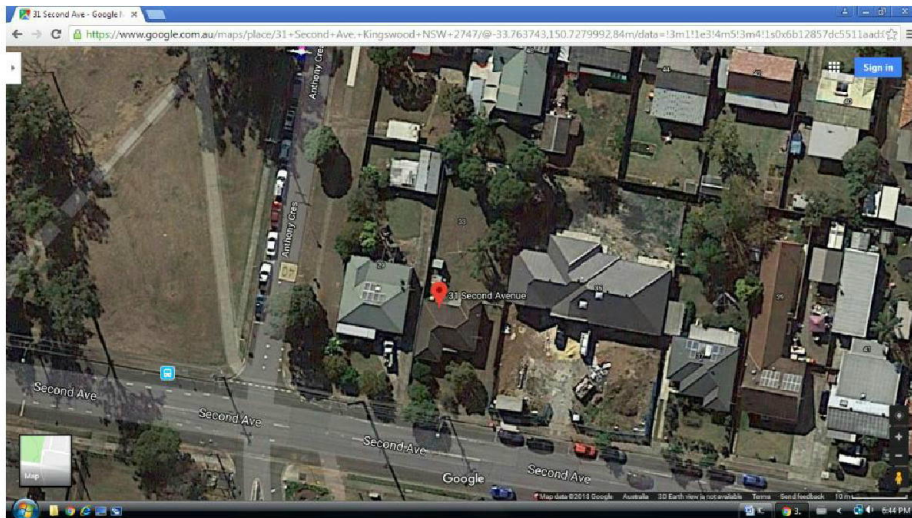


Figure 1 – Site location & Reading location

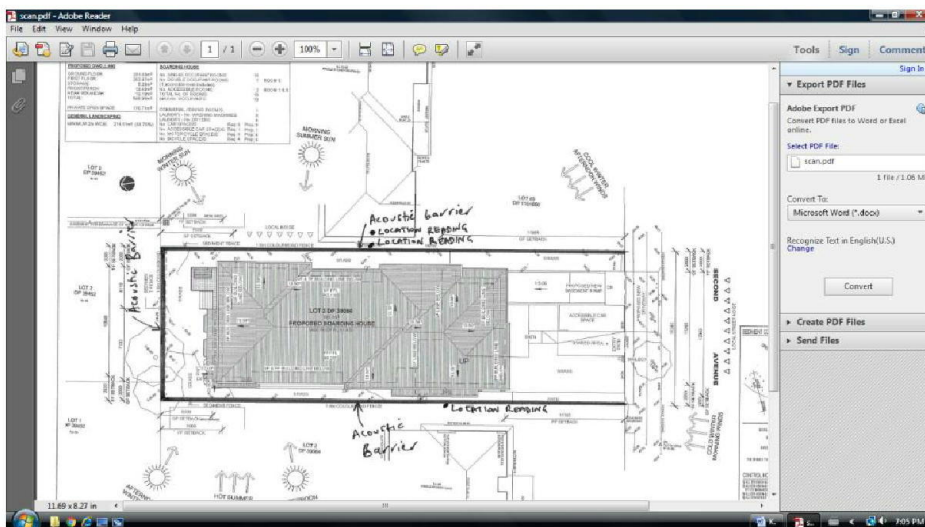
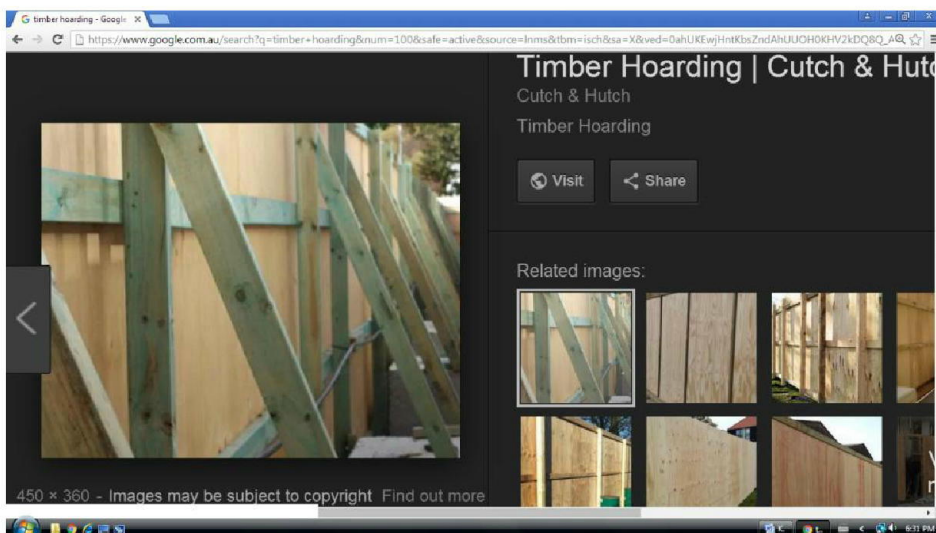


Figure 2 – Acoustic Barrier Wall RL48.50m AHD, along the side and rear boundaries



Typical Hoarding Frame on boundary lines – Refer to this report