# KINCUMBER AGED CARE FACILITY:

## Noise and Vibration Management Plan

**LENDLEASE RETIREMENT LIVING | REVISION 1 | 25-OCT-19**
**290 AVOCA DRIVE, KINCUMBER**

lendlease

# 1. Scope of Project and Sub-Plan

## Scope of the Sub-Plan

This Noise and Vibration Management Plan provides strategies and measures to minimise and control the generation of noise and vibration. It outlines appropriate measures to ensure that identification of noise and vibration, are managed appropriately during the construction phase including the site establishment, demolition, construction, fit out and commissioning of a project.

It describes measures to be implemented during relevant construction activities, which enables control of the impacts of construction activities on potentially affected receivers, and contingency measures that may be implemented if complaints are received or measured limits exceeded.

## Objectives of the Sub-Plan

- To achieve compliance with regulatory requirements and standards for noise and vibration management.
- To avoid excessive noise and vibration generation through site planning and the adoption of appropriate work methods and site management practices.
- To prevent or minimise to the greatest extent, the impact of construction noise and vibration on neighbours and the community.
- To establish and maintain positive relationships with project stakeholders.

## Scope of Works

This Plan has been prepared based on consideration of the following scope of works:

- Site establishment including vegetation removal, topsoil stripping, office and compound setup including waste management, material handling and storage areas;
- Disconnection and capping of the existing underground services;
- Excavation works to accommodate the additional utilities and associated infrastructure connections;
- Installation of additional utility and infrastructure connections; and
- Backfill and make good all excavated areas.
- Tree removal
- Earthworks
- Bored piles
- Buidling excavation
- Excavation and form for lift shafts
- Foundations & Lower Ground and Ground Floor slabs
- Scaffolding LGF & GF
- Columns & slabs for Level 1
- External Finishes, fitout and landscaping
- Decommissioning site

## Key Issues and Risks

The works described above have the potential to generate noise and vibration at levels, or at times, that may affect nearby residents, businesses and other community facilities. The closest sensitive receivers to the site have been identified as:

- Retirement Village units along the southern and western boundaries; and
- General housing along the northern and eastern boundary.

The activities with the greatest potential to create noise and/or vibration include:

- Land clearing at commencement of works;
- Bulk excavation for the new stormwater pipe and pits;
- The loading and haulage of materials on and off-site
- Civil construction for asspociated pedestrian and vehicle paths and roadways;
- The transport of materials to and from site on local roads;
- Servicing of waste management and storage areas;

- The use of hand tools, small generators and compressors;
- Concreting works; and
- Out of hour works.

High or prolonged levels of construction noise and vibration can cause annoyance to local receivers and damage to adjacent structures. The main risks associated with the works that will be conducted on this site are identified as:

- Noise impacting local resident's use of their property or causing annoyance and resulting in complaints and negative comment;
- Noise disrupting local events or the use of public facilities;
- Noise affecting local businesses including cafes with outdoor areas;
- Noise occurring outside of normal or approved construction hours; and
- Vibration affecting structures or causing concerns/fright within the community.

General assessment status:

- A Noise Assessment has not been prepared for this project.
- Background noise monitoring has been prepared for this project.
- General construction noise impacts will pose a moderate impact only to residents of the existing Brentwood Retirement Village, however noise associated with the excavation works is expected to have an impact on neigbouring residents and will be addressed in the Construction Plan;

The implementation of the control measures will be identified in the future EHS Plan and this Plan is intended to mitigate the risks and any potential impacts of noise and vibration on the environment and local community.

NOTE 1: Where a noise/acoustic assessment is unavailable it may be necessary to establish pre-construction background noise levels at nominated sensitive receiver locations. This will allow a Rating Background Level (RBL) to be determined for each location for day/evening, against which construction stage monitoring can be compared. Discuss this requirement with the Regional EHS Manager

NOTE 2: If background monitoring and construction noise predications are not available or required, the conditions of the project approval must be reviewed and met in regard to noise minimisation and control. Discuss this requirement with the Regional EHS Manager

NOTE 3: A vibration assessment and dilapidation surveys may be required to determine acceptable criteria and buffer zones for buildings and sensitive receivers and to establish a benchmark of current conditions. Construction stage monitoring requirements should also be identified.

## Legislation, Approval and Guidelines

Federal / National

- ANZECC Guidelines Technical Basis for Guidelines to minimise Annoyance due to Blasting Over pressure and Ground Vibration
- Australian Standard AS2436 (2010) Guide to Noise Control on Construction, Maintenance and Demolition Sites
- AS 1055.1-1997 Acoustics – Description and Measurement of Environmental Noise – General Procedures
- AS 1055.2-1997 Acoustics – Description and Measurement of Environmental Noise – Application to Specific Situations

State

- Protection of the Environment Operations Act 1997
- Interim Construction Noise Guideline NSW EPA 2009

Local

- Gosford Development Control Plan 2013
- Lendlease Global Minimum Requirements (GMR's):
    - 4.13 Degradation or Pollution of the Environment
    - 4.15 Uncontrolled Release of Stored Energy (non-electrical)

- Lendlease Building Workplace Delivery Code (WDC)

## 2. Summary of Controls

This plan must be read in conjunction with the Lendlease GMRs, Project Environmental Impacts and Hazards Assessment (IHRA), the Project EHS Plan, and the Lendlease Building WDC. These documents detail Lendlease's approach and commitment to pro-active and responsible site management.

### Noise

Site specific controls, monitoring, reporting and performance measurements have been identified in this Sub Plan to minimise and where possible prevent, the impacts of construction noise and vibration on the environment and community. These include but are not limited to:

- Performing and monitoring works in accordance with the project approval;
- Restricting works to approved construction hours;
- Assessing the potential impact of works that may be required or extend outside of approved construction hours (e.g. delivery of plant, large concrete pour) and seeking approval;
- Selecting appropriately sized plant, equipment and tools;
- Retrofitting plant with noise silencing devices;
- Substituting noisy processes or plant with less noisy options;
- Restricting the times and/or duration of noisy works;
- Communicating with project neighbours on a regular basis and providing advanced notification of noisy works; and
- Installing acoustic barriers or enclosures where they are deemed to be feasible and effective.

### Vibration

The project will make all practical efforts to protect vibration sensitive buildings and the amenity of the occupiers of the buildings. The project will apply a practical and economical combination of vibration control measures to manage vibration impacts such as:

- Substitution by an alternative process;
- Restricting times when work is carried out;
- Screening or enclosures;
- Consultation with affected residents; and
- During leisure hours, vibration disturbance from construction operation must be kept to a minimum.

The basis for this vibration management strategy will be to limit the times that certain vibration producing activities may be carried out. Generally, this will be accomplished by performing such work during DA consent approved hours.

No construction or demolition works is permitted within 50m vicinity of any heritage listed items or features of cultural significance.

Any activities potentially resulting in vibrations should be at greater distances to avoid disturbance of these protected items, feature located on the site.

A Noise and Vibration Impact and Monitoring Environmental Management Diagram will be prepared prior to any site activities commencing.

Construction stage noise and vibration minimisation and monitoring requirements will be included in relevant specifications, contract agreements, plant supply agreements, quality assurance documents, and subcontractor work method statements.

Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the EHS Plan and the following implementation table.

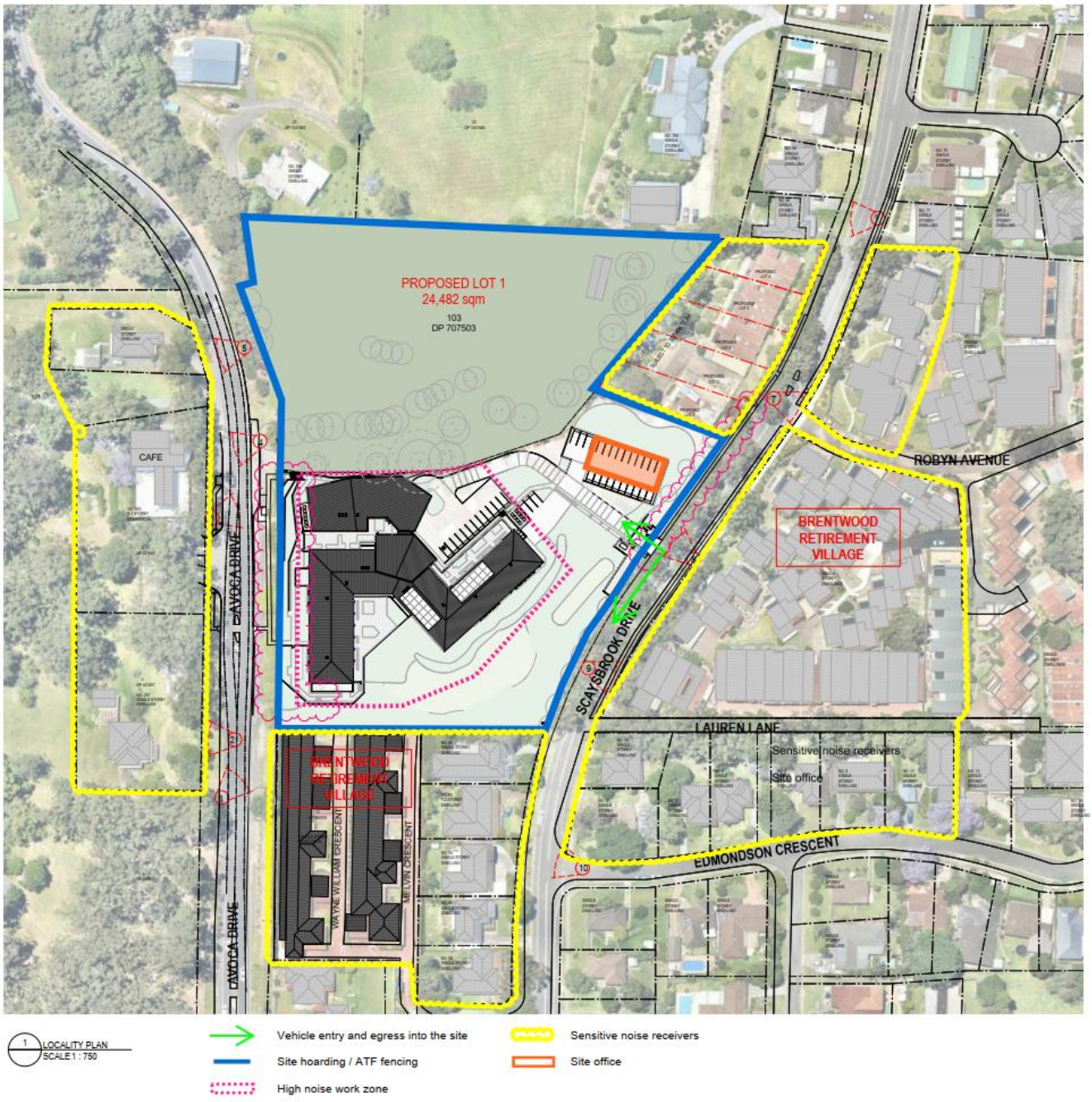
## 3. Implementation of the Plan

| Control Measure | Timing | Methodology | Responsibility | Monitoring & Reporting | Performance Measurement |
|---|---|---|---|---|---|
| **Planning and Site Establishment** | | | | | |
| Undertake dilapidation surveys of nominated properties, utilities and structures. | Prior to works commencing. | Appoint a consultant to undertake dilapidation surveys pre and post construction and review findings. | CM / SM | Surveys reviewed and works planned with consideration of the findings (as relevant). | No damage to properties or buildings. |
| Address noise minimisation, management, plant noise monitoring and maintenance as part of risk assessments and work planning. | Prior to works commencing. | WMSs prepared by major subcontractors to identify high noise and vibration generating activities, compliance with approved work hours, the duration of works, and the selection, substitution and use of appropriate plant. | SM | Discussion in planning sessions.<br>Addressed in IHRA and WMS.<br>Inspection o work activities<br>Noise monitoring results. | No complaints from the community. No work outside of hours without approval. |
| Prepare a Noise and Vibration Impact and Monitoring Environmental Management Diagram (EMD) identifying the location of potentially affected receivers, monitoring locations and work areas where noise will be generated. | Prior to works commencing. | Prepare EMD. Plan works with consideration to the location of sensitive receivers. Position noisy plant and equipment away from sensitive receivers and as far apart as practicable. Assess whether altering the orientation and/or location of the plant will reduce noise impacts. | PM / CM | Diagram prepared and communicated. | Sensitive receptors identified so that communication can be maintained. |
| Include information in the Site Induction about noise and vibration minimisation, management and monitoring. | Prior to works commencing. | Revise Lendlease induction package to include site specific risks and information. Deliver induction manual. | CM/SM | WMS's prepared by sub-contractors address noise and vibration minimisation, work hours, duration and the selection and use of plant. | Site induction delivered to all workers on site. |
| Install a noise barrier/hoarding along project boundaries (as feasible). | Prior to works commencing. | Identify the location of project neighbours and assess the feasibility and benefits of installing a barriers/hoarding to reduce noise transmission. | CM/SM | Noise monitoring results.<br>Number of complaints. | No complaints. No exceedances of predicted levels. |
| Design the site entry and internal roads to minimise and regulate truck movements and ensure vehicles enter and exit in a forward direction (to reduce beeper noise). | Prior to works commencing. | Address in site setup design.<br>Include this requirement in the Traffic Management Plan. | CM/SM | Continuous monitoring of traffic movements during construction. | No complaints from adjoining residents or authorities. |
| Provide advanced notification of the commencement of work. | Prior to works commencing. | Establish a list of project stakeholders including potentially affected neighbours, community, health and business facilities. Prepare appropriate information and distribute to the community. | CM / SM | List established and maintained.<br>Feedback recorded. | No community complaints. Positive relationship established with project neighbours. |
| Issue appropriate PPE for use on site where noise exceeds 85dB(A). | At all times. | Identify areas of the site where PPE is required. Install appropriate signage. Monitor compliance. | SM | Daily surveillance.<br>Weekly inspection checklist. | PPE consistently worn. |

| Control Measure | Timing | Methodology | Responsibility | Monitoring & Reporting | Performance Measurement |
|---|---|---|---|---|---|
| Establish a Plant & Equipment Register with details of approved equipment, noise compliance certificates and relevant restrictions/conditions of use (if any) if applicable. | Prior to works commencing. | Subcontractor to address in WMS and submit Plant & Equipment Register or service records. | GF | Included in subcontractor work method statements.<br>Sub-contractor audit. | All operators licensed.<br>No inappropriate use of plant or equipment. |
| **Work Hours** | | | | | |
| Comply with approved work hours per the revelvant approval. | At all times. | Identify and communicate approved work hours/days. Plan works and complete within approved hours. Provide notification to the community. | CM / SM | Documented approval received for work outside of approved hours. Monitoring of work outside of approved hours. | Timely approval of work outside of hours. No complaints. No work outside of approved hours without prior impact assessment and approval from the relevant regulatory authority. No fines. |
| If work needs to be performed due to unforeseen circumstances (e.g. concrete pour) outside the hours nominated, consent from the Central Coast Council must be obtained. | At all times. | Prior notice and approval from the Central Coast Council must be sought. | GF | Continuous as required. | No complaints from public or adjoining residents or authorities. |
| Provide advanced notification to potentially affected community stakeholders of out of hour's work/deliveries and high noise or vibration activities. | Prior to works commencing. | Prepare appropriate information and distribute to the community at least 3 days prior to the works occurring. | CM / SM | Feedback recorded. | No community complaints. Positive relationship established with project neighbours. |
| Where applicable if work activities involve noisy works, controls measure must be detail as part of the Work Method Statement | Prior to works commencing. | In accordance with the Noise and Vibration Management Plan. | Contractor | Continuous. | Work Method Statement to contain details of schedule of work and equipment being used. |
| **Plant and Equipment** | | | | | |
| Ensure that public address systems are not used (except in emergencies) | During construction. | Orientate speakers away from sensitive receivers. | SM | Monthly inspection. Review of effectiveness during emergency drills. | No complaints. |
| Operate plant and equipment in a proper and efficient manner and avoid unnecessary idling or engine noise. | At all times. | WMS prepared by subcontractor to address proper operation of plant and equipment and education of operators. | SM / Sub-contractor | Ongoing inspection of operators and operations. | All operators are licensed.<br>No inappropriate use of plant or equipment. |

| Control Measure | Timing | Methodology | Responsibility | Monitoring & Reporting | Performance Measurement |
|---|---|---|---|---|---|
| Ensure plant is fitted with silencers, acoustical enclosures or other noise attenuation measures. | At all times. | Subcontractor to address the risk based selection of appropriate plant and equipment in WMS.<br>Include requirement in subcontracts. Subcontractor to submit Plant & Equipment Register or service records. | SM / Foreman | Ongoing inspection of operators, activities and plant. Daily surveillance of noise levels. | All operators are licensed. No inappropriate use of plant or equipment. |
| Avoid rock-hammering where feasible and use alternative methods such as rock-saws and rippers where possible. | At all times. | Subcontractor to address in WMS. If the use of rock-hammers is unavoidable, use smaller rock breakers with quiet 'city hammers'. | SM / Foreman | Detailed SWMS prepared and communicated. Ongoing inspection of operators, activities and plant. Weekly inspection checklist | All operators are licensed. No inappropriate use of plant or equipment. |
| Consider the merits of different construction activities (e.g. piling techniques) in relation to noise and vibration impacts. | At all times. | Subcontractor to address in WMS and submit Plant & Equipment Register or service records. | SM / Foreman | Detailed SWMS prepared and communicated. Ongoing inspection of operators, activities and plant. Weekly inspection checklist. | All operators are licensed. No inappropriate use of plant or equipment. |
| Ensure that vibratory compactors are not used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with specified criteria. | At all times. | Included in subcontractor tenders. Subcontractor to submit Plant & Equipment Register or service records. 'Buffer zones' clearly marked out to prevent entry of plant. | SM / Foreman | Ongoing surveillance. | All operators licensed. No inappropriate use of plant or equipment. |
| Turn off vehicles and plant when not in use and avoid queuing and idling outside the site, particularly prior to the construction start time. | At all times. | Address in site induction. Subcontractors to address in WMS and communicate to all personnel. | SM / Foreman | Daily surveillance. Weekly inspection checklist. | No complaints from local community. |

## Appendix 1: Environmental Management Diagram



## Appendix 2: Typical Noise Levels of Major Plant

| Item | Typical Plant or Equipment | Max Noise Level (at 7 metres) |
|---|---|---|
| Bulldozer | Caterpillar D7, D9 | 88 |
| Bulldozer | Caterpillar D10 | 93 |
| Front End Loader | Wheeled | 90 |
| Jack Hammers | With silencing bags | 85 |
| Air Track Drill | 800 CFM Compressor | 96 |
| Scraper | Caterpillar 631 | 89 |
| Scraper | Caterpillar 651 | 85 |
| Grader | Caterpillar 16 | 85 |
| Compactor | Caterpillar 825 | 85 |
| Compactor | Vibrating Plate | 92 |
| Vibratory Roller | 10-12 Tonne | 89 |
| Water Cart | | 88 |
| Dump Trucks | 35 Tonne | 96 |
| Excavator | Kato 750 | 86 |
| Rock Breaker | Hydraulic on Kato 750 | 97 |
| Truck | | 80 |
| Crane | Truck Mounted | 85 |
| Compressor | 600 CFM | 75 |
| Compressor | 1500 CFM | 80 |
| Backhoe | | 88 |
| Spreader | Asphalt, concrete | 70 |
| Asphalt Truck | | 92 |
| Asphalt Paver | | 89 |
| Tip Truck | | 83 |
| Generator | Diesel | 79 |
| Spraying Machine | | 75 |
| Mechanical Broom | | 83 |
| Piling Hammer | For piles and casing | 93 |
| Concrete truck | | 83 |
| Concrete Pump | | 84 |
| Concrete Vibrators | | 80 |
| Drill | Air | 85 |
| Drill | Pneumatic | 85 |
| Welders | | 85 |