LENDLEASE CONSTRUCTION PTY LTD 97 000 098 162

LIVERPOOL HEALTH & ACADEMIC PRECINCT

NOISE AND VIBRATION ENVIRONMENTAL MANAGEMENT SUB PLAN

15/09/2021 | Issue No: 3.0

Document Issue Status				
Date	Document Issue (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
30/11/2016	2.0	General update including LLC GMR and legislative amendments.	Tracey Wallbridge	Brian Falls
15/09/2021	3.0	General update and revision for currency and to reflect updated WDC	Tracey Wallbridge	Ross Trethewy

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Project Revision Status				
Date	Project Revision (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
07/07/2021	Rev 1	Draft approved. Review Only	Lilly Cauchi	Michael Niedzwiecki
05/08/2021	Rev 2	Plan reviewed as per JohnStaff comments	Lilly Cauchi	Daniel Puljic
17/11/2021	Rev 3	Update template and acoustic assessment	Ian Sheils	Daniel Puljic
09/12/2021	Rev 4	Update to legislation	Ian Sheils	Daniel Puljic
02/03/2022	Rev 5	Review only no changes	Ian Sheils	Daniel Puljic
02/06/2022	Rev 6	Review only no changes	Dylan Stewart	Daniel Puljic
02/09/2022	Rev 7	Review only no changes	Dylan Stewart	Daniel Puljic
02/12/2022	Rev 8	Review only no changes	Dylan Stewart	Daniel Puljic

05/05/2023	Rev 9	Changed Lendlease Building to Lendlease Construction	Nigel Rose	Daniel Puljic
07/11/2023	Rev 10	General review & updated EMD	Nigel Rose	Daniel Puljic

SCOPE OF PROJECT AND SUB PLAN

Project Details	
Scope of the Sub Plan	This Noise and Vibration Environmental Management Sub Plan provides strategies and controls to manage noise and vibration during construction including early works, site establishment, demolition, structure, fit out and commissioning. It also describes processes for identifying activities that may have an impact on sensitive receivers and environments, and for the management of complaints, concerns, and exceedances of established noise and/vibration levels. Refer to Section 1.1 and 3.1 of the Project EHS Management Plan for clarification on how the EHS Sub Plans form part of the Lendlease Construction (LLC) EHS management system. NOTE: This Plan does not directly address 'occupational' (i.e., worker) noise and vibration impacts. Refer to the EHS Management Plan and Workplace Delivery Code for further information. Refer to PRA Noise and Vibration Management Plan V3
Objectives of the Sub Plan	● To minimise the impact of construction noise and vibration on the community. ● To manage noise and vibration through proactive planning and the adoption of appropriate work methods and site management practices. ● To meet or exceed standards and criteria for noise and vibration management. ● To establish and maintain positive relationships with project stakeholders.
Scope of Works	This Sub Plan has been prepared based on consideration of the following scope of works: The Liverpool Hospital is a Principal Group A1 tertiary referral hospital, managed by South Western Sydney Local Health District (SWSLHD). Liverpool Hospital currently has 713 inpatient beds and provides a wide range of tertiary and quaternary services. The redevelopment will increase the inpatient bed numbers to 900, as well as expanding tertiary and quaternary services. The Liverpool Hospital Clinical Services Plan 2031 (version 2.0 dated 26 November 2018) predicts substantial growth in service demand to 2025/26 which continues to 2030/31 due to significant population increase, major infrastructure in South Western Sydney and the poor health status of people within the Local Government Area (LGA) and surrounding areas. These increases result in demand well beyond the Hospital's present infrastructure capacities.

	Demolition and Construction of Stage 1 • Demolition of Education Facility, SIM, Kitchen, Library and Retail. • Diversion/Isolation/Disconnection of all associated services and plant within and supporting the Demolition works area. • Construction of ISB stage 1. ***Demolition and Construction of Stage 2*** • Demolition of Pathology, Oncology and Alex Grimson. • Diversion/Isolation/Disconnection of all associated services within and supporting the Demolition works area. • Construction of ISB Stage 2. • Construction of Campbell Street Shared Zone • On-grade car park works – All works associated with the on-grade car park. Some recommendations/requirements related to this area are within the MSCP Volume 3 reports. These will need to be allowed within the tender price. E.g., Remediation. ***Refurbishment Works*** • Refurbishment works within Caroline Chisholm • Refurbishment works within the CSB.
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 community facilities. The closest sensitive receivers to the site have been identified as: ● Existing operating Liverpool Hospital with Emergency Department. ● Liverpool Girls & Boys High Schools. ● TAFE NSW Liverpool Campus. ● Private Medical Practices (Ingham Institute); and ● Neighbouring Residents. The activities with the greatest potential to create noise and/or vibration include: ● Demolition of existing buildings.

- Securing of structural steel elements.
- Operation of Construction Plant (Cranes, hoists, concrete pump, etc).
- The loading and haulage of materials off-site.
- The transport of materials to and from site on local roads.
- Servicing of waste management and storage areas.
- Concrete Cutting (road saws and grinders); and
- The use of hand tools, small generators, and compressors.

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

- Noise affecting local residents' use of their property and resulting in complaints and negative comment.
- Noise disrupting local events, the use of public facilities or educational programs and exams.
- Vibration affecting medical equipment.
- Noise affecting local businesses including cafes with outdoor areas; and
- Noise occurring outside of normal or approved construction hours (without approval).
- Vibration affecting structures or causing concerns/fright within the community.

A NOISE/ACOUSTIC assessment including background noise monitoring has been prepared for this project. The assessment concluded that:

Noise impacts will pose a minor impact only to sensitive receptors.

- Receiver 1: Remaining Liverpool Hospital Development
- Receiver 2: Residential receivers located at 49,53,55-59,61,63,67,71,73-75 Goulburn Street to the west.
- Receiver 3: South West Radiation located at 51 Goulburn Street to the West.
- Receiver 4: Health Services Building and Ingham Institute located at 1 Campbell Street to the North.
- Receiver 5: Liverpool Girls High School located at 96 Forbes Street to the North-East.
- Receiver 6: Tafe NSW Liverpool located at 14 College Street to the South.
- Noise associated with the D&C Main Works may be expected to have an impact on certain areas and the recommendations of the assessment will be addressed within the sub plan.

The recommendations of the assessment:

Site Specific Recommendations

- Detailed site-specific recommendations to mitigate noise and vibration impacts on surrounding receivers are detailed below.
- Demolition is to be done using an excavator / machinery as much as possible / where able with a pulverising head attachment (as opposed to using a hydraulic hammer attachment).
- Stationed equipment shall be located appropriately and where practical and are to be screened if deemed necessary.
- Vehicle Noise:
    - Truck movements should not commence prior to 7am.
    - Trucks must turn off their engines during idling to reduce impacts on nearby residential receivers (unless truck ignition needs to remain on during concrete pumping).
    - Avoid careless dropping of construction materials into empty trucks.
- Equipment shall be well maintained.

Hand tools would only be typically used sporadically. Additionally, we recommend the following controls:

- In the event of a complaint, the use of hand-held jackhammers, grinders, and electric saws should be screened from surrounding receiver locations with localised acoustic barriers such as an Eco Barrier or plywood hoarding fixed to temporary fencing.

- Time Control: Limit noisy works i.e., rock hammering, sheet piling, pile driving and similar activities to between 9am to 12pm and 2pm to 5pm Monday to Friday and Saturday 9am-12pm in accordance with SSDA conditions C9.

General Recommendations

- Acoustic Barrier

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver. I.e., Hoarding separation to adjoining hospital

- Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

- Material Handling

The installation of rubber matting or carpet over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

	• Treatment of Specific Equipment In certain cases, it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts. • Establishment of Site Practices This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers. Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.
Legislation, Approval and Guidelines	**State & Guidelines** • Environmental Planning and Assessment Act 1979 (EP&A Act) • Protection of the Environment Operations Act 1997 (POEO Act) • Protection of the Environment Operations, Noise Regulation Controls (NRC) 2008 • NSW DECCW Interim Construction Noise Guideline (ICNG) 2009 • NSW DECC Assessing Vibration: A Technical Guideline 2006 • NSW EPA Noise Policy for Industry (NPI) 2017 • Australian Standard AS2436:2010 Acoustics – Guide to Noise Control on Construction, Maintenance and Demolition Sites • British Standard 6472: Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz) • British Standard 7385: Part 2 – Evaluation and Measurement of Vibration in Buildings • German Standard DIN 4150: Structural Vibration in Buildings – Effects on Structures • German Standard DIN 4150-3: Effects of Vibration on Structures (1999) **Local**: • Liverpool LEP 2008 • Liverpool Development Control Plan 2008

Lendlease Requirements:

- 4.13 Degradation or Pollution of the Environment
- 4.15 Uncontrolled Release of Stored Energy (non-electrical))
- Lendlease Construction Workplace Delivery Code (WDC) – Noise (environmental) and Noise (occupational)

SSDA-10389

Construction Noise Limits

C17. The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.

C18. The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4 except where permitted by condition C7.

C19. The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use of 'quackers' to ensure noise impacts on surrounding noise sensitive receivers are minimised.

Vibration Criteria

C20. Vibration caused by construction at any residence or structure outside the site must be limited to:

(a) for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and

(b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC 2006) (as may be updated or replaced from time to time).

C21. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C20.

C22. The limits in conditions C20 and C21 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B13 of this consent.

Summary of Site Controls	This Sub Plan must be read in conjunction with the Lendlease Global Minimum Requirements, Project Environmental Impacts and Hazards Assessment (IHRA), the Project EHS Plan, and the Lendlease Construction Workplace Delivery Code. These documents detail Lendlease's approach and commitment to pro-active and responsible site management. 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. For the management of noise, these will include but are not limited to: ● Conducting a noise and vibration assessment as part of early works to identify relevant sensitive receivers and to establish recommended specific management activities for these areas. ● Liaising with the Local Community Reference Group and other stakeholders on matters such as noise and vibration ● 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 for the work being performed (i.e., avoid oversized plant). ● Retrofitting plant with noise reducing devices. ● Inspecting plant for rattling or noisy components and removing off site as required. ● 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 high noise generating works; and ● Installing acoustic barriers or enclosures where they are deemed to be feasible and effective. For the management of vibration, these will include but not be limited to a practical and economical combination of measures such as: • The conduct of dilapidation surveys. • Substitution with an alternative process or plant. • Restricting times when vibration producing work is carried out. • Performing works within nominated hours only. • Establishing 'no work' buffer and monitoring zones. • Consultation with affected residents.

	A Noise and Vibration Impact and Monitoring Environmental Management Diagram will be prepared prior to any site activities commencing (Appendix 1). Construction stage noise and vibration management 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.

IMPLEMENTATION OF THE SUB PLAN

Control Measure	Timing	Methodology	Responsibility	Monitoring and 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 work planned with consideration of the findings (as relevant). Captured in IHRA.	No damage to properties or buildings.
Identify requirements for environmental (and occupational) noise and vibration monitoring and document a program for pre and during construction assessment.	Prior to works commencing .	Engage a consultant to develop a construction noise monitoring program.	CM SM	Monitoring implemented and reviewed in a timely manner (as per consultant recommendations).	Exceedances of criteria.
Include information in the Site Induction about noise and vibration minimisation, management, and monitoring.	Prior to works commencing	Include in induction package. Deliver induction material.	CM SM	WMSs prepared by subcontractor's address noise and vibration minimisation, work hours, duration and the selection and use of plant.	Site induction delivered to all workers on site.
Address noise minimisation, management, plant noise assessment and maintenance as part of risk assessments, work planning and subcontractor engagement.	Prior to commencing works	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, inspection, substitution and use of appropriate plant.	SM Engineers	Discussion in planning sessions. Monitoring of noise to be continuous during construction with parameters established for devices to issue alerts to Lendlease management for noise exceedances Addressed in IHRA and WMS.	No complaints from the community. No work outside of hours without approval.

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
				Inspection of work activities. Noise monitoring results. Complaint numbers/type.	
Prepare a Noise and Vibration Impact and Monitoring Environmental Management Diagram (EMD) identifying the location of potentially affected receivers and land uses, monitoring locations and work areas where high levels of noise will be generated.	Prior to works commencing	Prepare EMD. Plan works with consideration to 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.	CM SM	Diagram prepared and communicated. Diagram updated as works progress (min quarterly). Progress of works and change in risk identified and documented in the IHRA.	Sensitive receptors identified so that communication can be maintained.
Install a noise barrier/hoarding along project boundaries (where feasible and reasonable).	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. Consider type of work, times, and duration.	CM SM	Noise monitoring results. Number of complaints.	No complaints. No exceedances of predicted levels.
Design the site entry and internal roads where able, to regulate truck movements and maximise vehicle entry and exit in a forward direction (to reduce beeper noise).	Prior to works commencing	Address in site setup design. Include this requirement in the Traffic Management Plan.	CM SM	Continuous monitoring of traffic movements during construction.	No complaints from adjoining residents or authorities.
Issue appropriate PPE for use on site where noise exceeds 85dB(A).	Prior to commencing	Identify areas of the site where PPE is required.	SM	Daily surveillance. Weekly inspection checklist.	PPE consistently worn.

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
	and at all times	Install appropriate signage. Monitor compliance. Refer to the Workplace Delivery Code for further information.			
During Construction – Work Hours					
Comply with approved SSDA work hours. Provide advanced notification to potentially affected community stakeholders of out of hour's work/deliveries and high noise or vibration activities.	At all times. Prior to works commencing	Identify and communicate approved work hours/days. Plan works and complete within approved hours. Provide notification to the community of works required outside of hours. Prepare appropriate information and distribute to the community at least 3 days prior to the works occurring.	CM SM Engineer	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. Positive relationship established with project neighbours.
If work needs to be performed due to unforeseen circumstances (e.g., concrete pour) outside the hours nominated, consent from NSW Department of Planning, Industry and Environment (DPIE) must be obtained.	At all times	Prior notice and approval from the NSW Department of Planning, Industry and Environment (DPIE) must be sought.	GF	Continuous as required.	No complaints from public or adjoining residents or authorities.
During Construction - Plant and Equipment					
Establish a Plant and Equipment Register with details of approved	Prior construction	Subcontractor to address in WMS and submit Plant &	SM GF	Included in subcontractor work method statements.	All operators licensed.

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
equipment and relevant restrictions/conditions of use		Equipment Register or service records. Refer to Appendix 2 for guidance.		Sub-contractor audit.	No inappropriate use of plant or equipment.
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	Ongoing inspection of operators and operations.	All operators are licensed. No inappropriate use of plant or equipment.
Ensure plant is fitted with silencers, acoustical enclosures, or other noise attenuation measures if necessary (as per manufacturers specs).	At all times	Subcontractor to address the risk-based selection of appropriate plant and equipment in WMS. 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.
Consider the merits of different construction techniques (e.g., piling, rock hammering/saws/rippers) in relation to noise and vibration impacts.	At all times	Use non-percussive piling techniques where practicable. If impact piling is required, consider hours of operation, lowering hammer height, shielding with equipment, or using acoustic shrouding and resilient dollies.	SM Foreman	Detailed WMS 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	At all times	Included in subcontractor tenders.	SM Foreman	Ongoing surveillance.	All operators licensed. No inappropriate use of plant or equipment.

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
monitoring confirms compliance with specified criteria.		Subcontractor to submit Plant & Equipment Register or service records. 'Buffer zones' clearly marked out to prevent entry of plant. Refer to Appendix 3 for guidance.			
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 (EMD)

ENVIRONMENTAL MANAGEMENT DIAGRAM – LIVERPOOL HEALTH & ACADEMIC PRECINCT PROJECT

EXTENT MAP

KEY ENVIRONMENTAL ISSUES

- Unexpected finds
- Noise to general public / Hospital
- Water run off
- Sediment run off

SENSITIVE RECEPTORS

- Local Residents in Goulburn & Campbell Streets
- Alex Grimson Building
- Caroline Chisholm Building
- Existing Clinical Services Building
- Liverpool TAFE – College Street Campus
- Ingham Institute

KEY CONTROL MEASURES

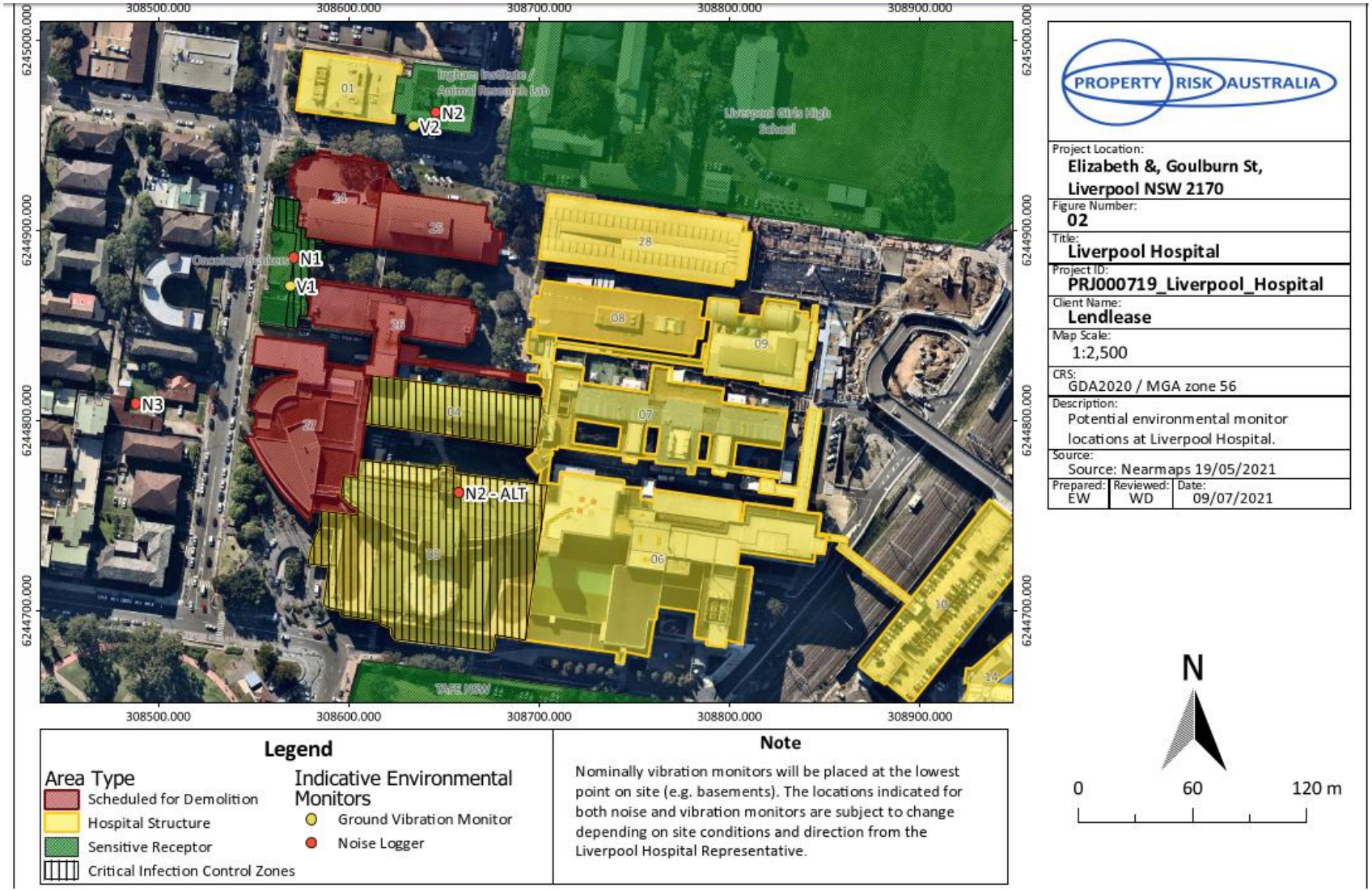
- Blue metal to cap exposed soil
- Geofabric under pit grates to stormwater inlets to filter water
- Radiation monitoring of cancer bunker
- Shaker grid located inside of gates 2 & 3
- High pressure washer to clean tyres in inclement weather

LEGEND

Icon	Descriptions
	Site Accommodation
	A-Class Hoarding
	Shaker Grid
	Spill Kit
	HS / DG Storage
	Tree Protection Zone
	Stormwater Inlet
	Radiation Monitor
	Noise Monitor
	Ground Vibration Monitor
	Rubbish Skip

KEY CONTACTS

Senior Construction Manager	Senior Site Manager	General Foreman	Senior EHS Coordinator	Emergency Services
Daniel Puljic 0477 393 259	Damien Smith 0437 559 361	James Hall 0429 801 618	Nigel Rose 0428 741 878	000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PROPERTY RISK AUSTRALIA
Project Location:
Elizabeth &, Goulburn St, Liverpool NSW 2170
Figure Number:
02
Title:
Liverpool Hospital
Project ID:
PRJ000719_Liverpool_Hospital
Client Name:
Lendlease
Map Scale:
1:2,500
CRS:
GDA2020 / MGA zone 56
Description:
Potential environmental monitor locations at Liverpool Hospital.
Source:
Source: Nearmaps 19/05/2021
Prepared: EW
Reviewed: WD
Date: 09/07/2021
Legend
Area Type
Scheduled for Demolition
Hospital Structure
Sensitive Receptor
Critical Infection Control Zones
Indicative Environmental Monitors
Ground Vibration Monitor
Noise Logger
Note
Nominally vibration monitors will be placed at the lowest point on site (e.g. basements). The locations indicated for both noise and vibration monitors are subject to change depending on site conditions and direction from the Liverpool Hospital Representative.
N
0
60
120 m

NOISE LIMITS FOR ANY RESIDENCE

DA CONDITIONS B22

Location	Noise Limits in dB(A)			
	Day	Evening	Night	Night
	L_{Aeq}(15 minute)	L_{Aeq}(15 minute)	L_{Aeq}(15 minute)	L_{AFmax}
Any residence	47	43	38	53

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

APPENDIX 3: GUIDELINE FOR ROLLER USE NEAR STRUCTURES

Roller Class & Weight Range	Centrifugal Force Range	Example of Rollers	Distance from Building A	Distance from Building B	Remarks
Very Light Less than 1.25 tonnes	10-20kN	Coates 32RD tandem Davleco 32CR tandem	3m	--	Maintenance and patching rollers. Generally, not restricted for normal
Light 1 to 2 tonnes	20-50kN	Coates 42RD tandem Pannell 54T drawn	5m	--	Generally, not restricted for normal road use.
Medium 2 to 4 tonnes	50-100kN	Coates 66Tdrawn Davleco 66 drawn	6m	12m	
Medium-Heavy 4 to 6 tonnes	100-200kN	Coates 72Tdrawn Davleco 72 drawn Pacific V12 drawn Raypo Rascal 400	12m	24m	Not advised for city and suburban streets.
Heavy 7 to 11 tonnes	200-300kN	Coates 78Tdrawn Pacific V24D drawn Raypo Rascal 600	25m	50m	Restricted. Not advised built-up areas.
Very Heavy 12 tonnes and over	Over 300kN	Coates 96Tdrawn Pacific V36D drawn	25m	50m	Restricted to major construction areas away from structures and buildings.