Appendix Y Construction Noise and Vibration Management Plan

Fast-Track Approvals Act 2024 Substantive Application

Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.: 880.016894.00001

19 August 2026

Construction Noise and Vibration Management Plan

Hinuera Solar Farm Project- Fast Track Approvals Application

Harmony Energy NZ #6 Limited

Prepared by:

SLR Consulting New Zealand Limited

SLR Project No.: 880.016894.00003

24 June 2026

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	24 June 2026	W. Posada	L. Jansen E. Buckingham	P. Runcie

Basis of Report

This report has been prepared by SLR Consulting New Zealand Limited (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Harmony Energy NZ #6 Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid. SLR may have used AI in the preparation of this document.

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Glossary

A' weighted	A frequency adjustment which represents how humans hear sounds.
Ambient noise level	The all-encompassing sound associated with an environment or area.
dB	Decibel
dBA	'A' weighted decibel
DIN 4150-3	German Industrial Standard DIN 4150-3 (1999): Structural vibration – Part 3 Effects of vibration on structures.
Free field	A monitoring location where the microphone is positioned sufficiently far from nearby surfaces for the measured data to not be influenced by reflected noise.
Hz	Hertz
Impulsive noise	Noise with a high peak of short duration, or sequence of peaks.
Intermittent noise	Noise which varies in level with the change in level being clearly audible.
L90, L10, etc.	Statistical exceedance levels, where LN is the sound pressure level exceeded for N% of a given measurement period.
LAeq	The 'A' weighted equivalent noise level. It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.
LAmax	The A' weighted maximum sound pressure level of an event.
Low frequency	Noise containing energy in the low frequency range.
LP or SPL	Sound Pressure Level.
Lw or SWL	Sound Power Level.
MPDC	Matamata-Piako District Council.
MPDP	Matamata-Piako District Plan.
NZS 6801:2008	New Zealand Standard NZS 6801:2008 "Measurement of Environmental Sound".
NZS 6802:2008	New Zealand Standard NZS 6802:2008 "Assessment of Environmental Noise."
NZS 6803:1999	New Zealand Standard NZS 6803:1999 "Acoustics – Construction Noise."
Octave-band	A frequency band where the highest frequency is twice the lowest frequency.
SWDC	South Waikato District Council.
SWDP	South Waikato District Plan.
Tonality	Noise containing a prominent frequency.

1.0 Introduction

This document serves as the Construction Noise and Vibration Management Plan (**CNVMP**) for the construction of the Hinuera Solar Farm, located at the intersection of State Highway 29 and State Highway 27, Hinuera, within the Matamata-Piako District Council, approximately 10 km south of Matamata.

This CNVMP outlines the noise and vibration criteria and identifies mitigation, management, and monitoring measures along with communication and complaints procedures. This is a living document and shall be updated as and when needed in response to new project information.

The intention of this document is to provide a framework for noise and vibration management to control noise and vibration levels at neighbouring buildings. This document refers to the following documents and standards:

- Acoustic Assessment, reference number 810.V14302.00003-R01, dated 20 January 2026.
- New Zealand Standard NZS 6803:1999 *Acoustics-Construction Noise* (**NZS 6803:1999**)
- German Standard DIN4150-3:1999 *Structural vibration – Part 3 Effects of vibration on structures*. (**DIN4150-3:1999**)

This is the draft CNVMP and should be updated according to the final construction methodology and relevant conditions of consent prior to commencement of construction.

2.0 Project Description and Surrounding Land

The construction works involve installing a single-axis tracking solar array of about 170,000 panels along with distributed inverter and battery units across the site based on the proposed tracking layout. Works also include building supporting infrastructure such as the switching station, O&M building, storage facilities, and security fencing for a largely automated operational facility. Existing farm structures would be removed.

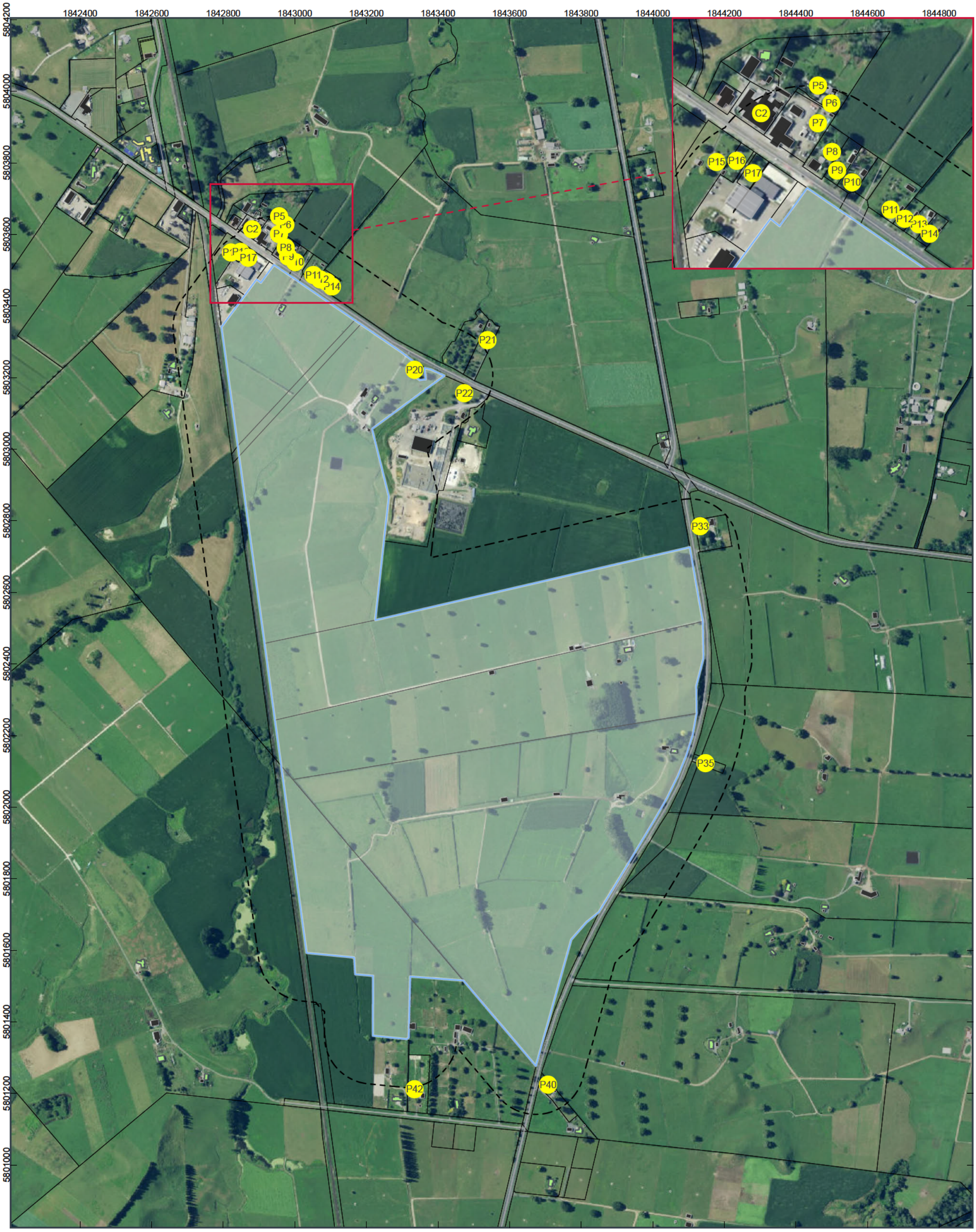
2.1 Surrounding Receivers

The surrounding environment is zoned Rural and is characterised by agricultural land uses. Most receivers are located within the Matamata-Piako District Council area, with some in the South Waikato District Council to the south-east.

The receiver list has been limited to dwellings within 135 metres of the site boundary. This distance is based on the construction noise assessment, which identifies 135 metres as the threshold beyond which higher intensity activities (including multiple impact piling rigs) can be undertaken while maintaining compliance with the relevant noise criteria.

For context, typical construction activities (such as earthworks, vehicle movements and general plant operation) are expected to occur much closer to the work areas and generally require substantially smaller setback distances to achieve compliance.

The receivers relevant to construction activities are shown in **Figure 1** and detailed in **Table 1**.



0 50 100 200 Meters

Coordinate System:	NZGD 2000 New Zealand Transverse Mercator
Scale:	1:4,500 at A3
Project Number:	880.016894.00001
Date:	23/04/2026
Drawn by:	L. Jansen

Map Element Legend

- Receivers
- 135m from Site Boundary
- Hinuera Solar Farm Subject Site
- LINZ NZ Primary Parcels

Existing Buildings

- Onsite Dwelling
- Residential
- School
- Church
- Unknown

SLR

HARMONY ENERGY NZ LIMITED
HINUERA SOLAR FARM PROJECT
ACOUSTIC ASSESSMENT

CNVMP Surrounding Receivers

FIGURE 1

Table 1 Summary of Surrounding Receivers

Property Reference Code	Address	Legal Description
P5	4792A State Highway 29	Lot 3 DPS 71461
P6	4792C State Highway 29	Lot 4 DPS 71461
P7	4788 State Highway 29	Lot 1 DPS 10302
P8	4784 State Highway 29	Lot 1 DP 32466
P9	4782 State Highway 29	Lot 1 DPS 40538
P10	4780 Stae Highway 29	Lot 2 DPS 40538
P11	4774 State Highway 29	Lot 2 DPS 3374
P12	4772 State Highway 29	Lot 1 DPS 2475
P13	4770 State Highway 29	Lot 2 DPS 2475
P14	4768 State Highway 29	Lot 3 DPS 2475
P15	4795 State Highway 29	Lot 2 DPS 10678
P16	4793 State Highway 29	Lot 4 DPS 10678
P17	4791 State Highway 29	Lot 1 DPS 16489
P20	4735 State Highway 29	Lot 1 DPS 12998
P21	4720A State Highway 29	Lot 1 DPS 71145
P22	4713 State Highway 29	Lot 2 DP 463615
P33	8243 State Highway 27	Lot 1 DPS 7320

2.2 Construction Methodology

The following works are anticipated to be the key noise and vibration generating activities during construction:

- Excavation
- Grading
- Compaction
- Impact Piling

The specific construction methodology shall be detailed in the project specific Construction Management Plan (**CMP**)[1]

[1] Construction Management Plan to be prepared by the Contractor/Project Team at the appropriate time.

2.3 Programme

The construction work duration is expected to exceed 20 weeks, classified as Long-term in accordance with the definitions of NZS 6803. The approximate duration of the proposed construction activities is provided in **Table 2**.

Table 2 Construction Activities and Appropriate Durations

Activity	Approximate Duration
Excavation	TBC when contractor appointed
Grading	TBC when contractor appointed
Compaction	TBC when contractor appointed
Impact Piling	TBC when contractor appointed
Lifting	TBC when contractor appointed

2.4 Hours of Operation

Construction works are expected to occur between 7:00 am and 6:00 pm, Monday to Saturday, with no work on Sundays or public holidays.

Quiet activities such as, but not limited to, staff arrivals/departures, office work (including driving around onsite for environmental observations, use of small hand tools and deliveries may occur outside these hours. High-noise activities are to be scheduled after 7:30 am to minimise early morning impacts. This restriction does not apply to the logistical movements such as relocating equipment to the day's working area.

3.0 Roles and Responsibilities

A project team representative must be assigned to be the responsible person for implementation of this CNVMP. All documentation relating to construction noise and vibration should be reviewed by the project team representative before it is issued.

3.1 Contact Details

The key personnel and contact details for management of construction noise and vibration of the development are provided in **Table 3**.

Table 3 Table for Key Personnel and Contact Details

Role	Name	Organisation	Phone	Email
Project Manager	TBC	TBC	TBC	TBC
Contractor Project Manager	TBC	TBC	TBC	TBC
Public Complaint	TBC	TBC	TBC	TBC
Acoustic Advisor	LJ Jansen	SLR	[redacted]	[redacted]

3.2 Staff Training and Inductions

Training related to construction noise and vibration management and awareness for personnel working on the site shall be undertaken as part of the site induction programme.

This requires personnel to participate in an induction training session when they commence work.

Inductions must include a briefing on this CNVMP, with attention given to the following aspects in particular:

- Roles and responsibilities for the management of construction noise and vibration.
- Relevant noise and vibration criteria.
- Information about noise and vibration sources on-site and locations of critical surrounding receivers.
- Noise and vibration mitigation measures and management procedures.
- Complaints management procedures.

In addition to the above general induction training, specific activities that may generate significant noise and/or vibration effects must be identified at “tool-box” meetings prior to those works being undertaken. The tool-box meetings should also be used to address any concerns or complaints that have been raised.

4.0 Construction Noise and Vibration Criteria

Criteria for construction noise and vibration are set by the Matamata-Piako District Plan (**MPDP**), the South Waikato District Plan (**SWDP**) for noise, and the internationally recognised DIN 4150-3:1999. Together these documents provide the applicable limits and guidance for acceptable noise and vibration levels during construction activities.

4.1 Noise

The limits in **Table 4** apply 1 metre from the façade most exposed to the sound under investigation when measured and assessed in accordance with NZS 6803:1999.

Table 4 Construction Noise Limits

Time of Week	Time Period	Long-term duration of Construction work (more than 20 weeks)	
		dB L_{Aeq}	dB L_{Amax}
Weekdays	6:30 am – 7:30 am	55	75
	7:30 am – 6:00 pm	70	85
	6:00 pm – 8:00 pm	65	80
	8:00 pm – 6:30 am	45	75
Saturdays	6:30 am – 7:30 am	45	75
	7:30 am – 6:00 pm	70	85
	6:00 pm – 8:00 pm	45	75
	8:00 pm – 6:30 am	45	75
Sundays and public holidays	6:30 am – 7:30 am	45	75
	7:30 am – 6:00 pm	55	85
	6:00 pm – 8:00 pm	45	75
	8:00 pm – 6:30 am	45	75

4.2 Vibration

Vibration from works within the site shall comply with the guideline values shown in **Table 5** below. Vibration Levels shall be measured and assessed in accordance with DIN 4150-3.

Table 5 Guideline Values for Vibration

Line	Type of Structure	Guideline values for vibration in mm/s				
		Short-term Vibration				Long-term Vibration
		Vibration at the foundation at a frequency of:			Vibration at horizontal plane of highest floor at all frequencies	Vibration at horizontal plane of highest floor at all frequencies
		1-10Hz	10-50Hz	50-100Hz		
1	**Commercial type building**	20	20-40	40-50	40	10
2	**Residential type building**	5	5-15	15-20	15	5
3	**Listed buildings and sensitive to vibrations**	3	3-8	8-10	8	2.5

5.0 Stakeholder Engagement

5.1 Liaison with Community

Communication with surrounding stakeholders is of similar importance to the level of noise or vibration generated by the works. Maintaining a good relationship with the surrounding neighbours can assist greatly in ensuring effects from construction works are responsibly managed.

The following methods of communication shall be undertaken.

- Notice boards showing contact details of the project manager and contractor must be displayed at the entrance(s) of the site at publicly accessible locations.
- **Occupied neighbouring dwellings within 135 metres of the site boundary** shall be advised in writing (e.g., via letter drop) prior to commencement of works. The communication must set out a brief overview of the works, the expected duration of the project and specific activities, the mitigation measures to be implemented, the working hours, and contact details for any concerns regarding noise and vibration.

5.2 Liaison with Council

The contractor's project manager will be responsible for communication with MPDC and SWDC.

6.0 Construction Equipment Emission Data

6.1 Noise

Table 6 identifies the range of potential high noise generating plant items expected to be used during construction and their associated typical noise levels with approximate setback distance without mitigation to achieve compliance with 70 dB L_{Aeq}.

Table 6 Equipment and Typical Noise Emission Levels

Activity	Plant Item	Sound Pressure Level at 10 metres	Approximate setback distance (metres) without mitigation (7:30 am – 6:00 pm limit of 70 dB L_{Aeq})
Excavation works	Excavator (<30t) fitted with a bucket attachment	75 dB L_{Aeq}	30
Clearing	Woodchipper	85 dB L_{Aeq}	120
	Dozer (≤10t or ≤80kW)	75 dB L_{Aeq}	24
	Dozer (10-25t or 80-165kW)	80 dB L_{Aeq}	45
Grader	Motor Grade (≤20t) with blade	65 dB L_{Aeq}	17
	Motor Grade (20-30t) with blade	70 dB L_{Aeq}	30
Compaction	Non-vibratory roller (<15t)	70 dB L_{Aeq}	13
	Non-vibratory roller (>15t)	65 dB L_{Aeq}	8
	Vibratory Plate Compactor (<250kg)	80 dB L_{Aeq}	45
	Vibratory roller (<3t)	75 dB L_{Aeq}	11
Transport	Transportation truck	75 dB L_{Aeq}	13
	Concrete Truck	70 dB L_{Aeq}	21
	Water Truck	65 dB L_{Aeq}	8
Assembly	Mobile Wheeled Crane (<150t)	70 dB L_{Aeq}	13
	Generator	65 dB L_{Aeq}	11
	Powered Tools	65 dB L_{Aeq}	10
Impact Piling	Solar Piling Rig	85 dB L_{Aeq}	75

6.2 Vibration

The highest levels of construction vibration are expected to be associated with impact piling. Recent in-house measurements of this activity, undertaken as part of a solar farm construction project in New Zealand, recorded vibration levels of up to 5 mm/s PPV at approximately 10 metres from the source.

Based on these measurements, vibration generated by the proposed construction activities is not expected to be perceptible at the nearest dwelling. Predicted levels would be significantly lower than the guideline limits for avoiding cosmetic building damage, and therefore comply with the project criteria.

7.0 Mitigation and Management Measures

The recommended noise and vibration mitigation measures provided in **Table 7** have been identified to control construction generated noise and vibration levels such that they generally comply with the relevant applicable noise and vibration requirements. These recommended mitigation measures are considered to be the best practicable options (**BPO**) and should be implemented as far as is feasible and practicable.

Key mitigation measures are included in **bold** in **Table 7** below.

Table 7 Recommended Noise and Vibration Mitigation Measures

Activity	Recommended Mitigation Measures
General Site Management	• Amplified music or radios not to be played on site. • All plant and equipment to be well maintained and serviced regularly. • Low noise/vibration emitting equipment is to be selected where practical, with a preference to the selection of equipment fitted with silencers/mufflers. • Silencers or mufflers on construction plant, if any, to be properly maintained. • Low noise/vibration methods to be adopted where practical. • Tools and materials not to be thrown or dropped. • Machines and plant that may be in intermittent use to be shut down between work periods or throttled down to a minimum. • Smallest/quietest machine practicable for the works to be used. • Delivery vehicles must not idle whilst on the site, or in the road while waiting to access the site. • The use of high noise generating equipment on the subject site to be restricted to between 7:30 am to 6.00 pm Monday to Saturday. No work on Sundays or public holidays. • Where feasible, equipment to be fitted with broadband reverse alarms. • **Should the equipment plant referenced in Table 6 change in size or rating, please seek advice from the project acoustic advisor before using onsite.**
Excavation / Hauling	• Heights of materials dropped from the bucket to be minimised, especially when filling an empty truck. • Where spoil is being loaded into a dump truck, or fill materials are being scooped from a dump truck, the dump truck to be positioned to minimise reversing and tracking movements. • Number of trucks required/idling on site to be minimised by planning and scheduling of works. • Avoid slamming truck tailgates shut.
Clearing	• Any woodchippers to be located more than 120 m from any occupied dwellings. If the wood chipper is required to be located closer to any occupied dwelling, seek advice from acoustic specialist before use.
Impact Piling	**Number of Impact piling equipment must be managed based on the following setback distances to occupied dwellings as shown in Figure 2.** • **< 75 m**: No impact piling without prior investigation or mitigation. • **75 m - 105 m**: Impact piling may be carried out by one rig only. • **105 m - 135 m**: Impact piling may be carried out by up to two rigs. • **≥ 135 m**: Impact piling may be carried out by three or more rigs.

Figure 2 Impact Piling Set Back Distances

8.0 Complaint Handling

Noise and/or vibration complaints shall be responded to in a prompt manner. The Public Complaints Contact (see **Table 3**) must be the contact person for managing noise and vibration complaints; this role is also the contact for noise/vibration related visits from Council's control officers or other Council staff.

The Public Complaints Contact shall ensure that complaints are logged on the project complaint register. An example Complaints Record pro-forma is included in **Appendix B**.

In the event of a complaint being received in relation to noise or vibration, the Public Complaints Contact shall:

a) Note in writing the nature of the complaint, request contact details from the complainant and advise them that the matter will be investigated as soon as possible.

b) Immediately check activities and subjective noise or vibration levels in the area near the complainant's property and, if appropriate, other parts of the site.

c) If activities are identified that are considered to be generating excessive noise or vibration, the project team representative shall take appropriate action (e.g., implementation of mitigation measures, change of construction methodology, etc.) to reduce noise or vibration to an acceptable level.

d) Contact the complainant and advise them of the outcome of the investigation and make a written note in the complaint book of the event and the outcome.

If a complaint cannot be resolved through the above process, it may be necessary to arrange noise and/or vibration monitoring to determine the actual noise and/or vibration levels on the complainant's property (see **Section 9.0**)

9.0 Noise and Vibration Monitoring

9.1 Noise

Noise monitoring may be required in response to reasonable noise complaints being received. Construction noise levels shall be monitored and assessed as follows:

- Conducted by a suitably qualified and experienced person (e.g., Member of the Acoustical Society of New Zealand or equivalent).
- In accordance with the requirements of NZS 6803:1999.
- At a location representative of sensitive receivers/complainants in the vicinity.
- To reflect representative construction activities. The measured noise levels shall be stated along with the measurement duration (T).
- One metre from the most affected façade or, if this position is not accessible, at an equivalent position where practicable. If this is not possible, measured noise levels shall be adjusted for distance and façade reflections if necessary.
- If external measurement is impractical or inappropriate, noise monitoring shall be conducted inside the building of concern (with windows closed), and the internal noise limit would be 20 dB less than the relevant limits.
- When monitoring is requested by either MPDC or SWDC in response to a reasonable complaint.

If exceedance of the noise limits is identified by the monitoring, the activity resulting in the exceedance shall be stopped and the process should be reviewed. Mitigation measures to achieve compliance or reduce noise as far as practicable will be identified prior to re-starting the activity, these may take the form of increased boundary or localised screening, among others.

9.2 Vibration

Vibration monitoring may be required in response to reasonable complaints being received. Construction vibration levels shall be monitored and assessed as follows:

- In accordance with the requirements of DIN 4150-3.
- To reflect representative activities and shall comprise measurements of peak particle velocity (PPV).

If the measured construction vibration levels exceed the limits in **Section 0**, the activity resulting in the exceedance shall be stopped and the process should be reviewed. Mitigation measures or revised construction methodology shall be identified prior to resume the activity.

10.0 Reporting

The following information shall be recorded and maintained by the Contractor Project Manager and be provided to the Council of interest upon reasonable request:

- Record of Discussions with Neighbours - See example pro-forma in **Appendix A**.
- Complaints Record – See example pro-forma in **Appendix B**.
- Noise and/or Vibration Monitoring Results – to be maintained by the project manager.

Appendix A Example Pro-Forma for Discussions with Neighbours

Construction Noise and Vibration Management Plan

Hinuera Solar Farm Project-Fast Track Approvals Application

Harmony Energy NZ #6 Limited

SLR Project No.: 880.016894.00003

24 June 2026

A.1 Example Pro-forma for discussion with Neighbours

Date and Time:	
Location:	
Contractor's Representative:	
Public Member Individual/Representative/Group:	
Discussion Topics:	
Feedback:	
Outcome:	

Appendix B Example Pro-Forma Complaints Record

Construction Noise and Vibration Management Plan

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24 June 2026

B.1 Complaints Record

Date and Time:	
Location:	
Contractor's Representative:	
Complainant details (name and contact number/email):	
Nature of the Complaint:	
Comments:	
Outcome:	

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