

MEMO

Project:	Glen Isla Coastal Protection Project	Document No.:	Mm 002 r02		
To:	Glen Isla Protection Society	Date:	6 December 2024		
Attention:	Allan Fraser	Cross Reference:	Mm 001 r01		
Delivery:	Email	Project No.:	20240399		
From:	James Whitlock	No. Pages:	8	Attachments:	Yes
CC:	Lincoln Fraser	Luke Faithfull			
Subject:	Response to s92 queries				

We have reviewed the Section 92 queries from Western Bay of Plenty (WBOP) District Council (prepared by Styles Group) received by email on 14 November 2024.

In this memo we set out their questions (in blue font) and answer each one.

We note that to date we have only prepared that memo, which was a report on the noise and vibration trial we undertook in July 2024, not an assessment of effects. Nevertheless, we have addressed Mr Styles' queries relating to effects.

Question 1

The MDA memo states that the relevant construction noise limits are 75dB L_{Aeq} and 90dB L_{AFmax} . These have been taken directly from Table 2 of NZS6803:1999 for "typical duration" works without any adjustment for the duration of the work. I understand that the likely best case scenario is four months to complete the works, but the applicant is seeking up to six months. The threshold between "typical duration" and "long term" works in NZS6803:1999 is 20 weeks, or five months. "Long term" works are subject to noise limits that are 5dB lower than those applying to "typical duration" works.

The applicant is seeking six months to account for potential bad weather and other unforeseen issues, but all going well the work will be completed in 4 months.

Our predicted noise levels show compliance with the long-term duration noise limits at all dwellings (save the applicant's house), and compliance with the typical duration limits at all dwellings. So the outcome and compliance status in terms of noise is the effectively the same.

Question 2

There seems to be a bit of a discord between the construction methodology assumptions in the MDA memo and the way that the construction process was explained to us on the site visit.

The MDA memo appears to be based on the rocks being dropped near the eastern end of the reserve north of 7 Glen Isla Place and the excavator being used in the reserve, whereas we were told that the rocks will be delivered by a truck, driven through the reserve and around the foreshore area and dumped near to where they will eventually be placed (which will vary as the works progress).

Additionally, the excavator will only traverse the council reserve twice (once in, and once out) or more often if there is a severe storm forecast and the machinery has to be moved away from the beach area. The MDA memo appears to take this distance into account by stating that the works will be at least 35m from 7 Glen Isla Place (rather than the 55m or-so away where the rocks were dropped), but there is no diagram or clear explanation of this.

Can MDA clarify that the noise level and vibration predictions in the memo are intended to reflect the proposed construction methodology and the effects at 7 Glen Isla Place?

Yes, the intention of the trial was to measure noise and vibration at distances relevant to the works.

Our memo outlines the measurements we made during a *trial* methodology, which we designed and carried out to capture relevant noise and vibration data. We then used that data to predict levels during the actual works occurring in the foreshore area.

We understand that we were not permitted to use the foreshore area for the trial, so we were limited to the WBOP reserve land. We set up the source and monitor locations in the trial so they were directly relevant to the actual works. Although since developing the trial, the proposed source-receiver distances of the actual works have increased, which will reduce noise and vibration levels.

Question 3

As above, the MDA memo seems to be based on the proposed construction methodology and the levels and effects at 7 Glen Isla Place. These are separated by approximately 30-35m.

On this basis, the MDA memo states that the permitted construction noise limits will be complied with. However, the works will be much closer to other dwellings on sites that are not part of the application site, such as 16 Glen Isla Place.

The works appear to be around 10m from the nearest part of the dwelling on that site. Accordingly, I consider it likely that noise from the works will not necessarily comply with the permitted construction noise limits at some of the dwellings immediately adjacent to the works, and that resource consent will be necessary to enable this infringement.

I understand that many or all of these dwellings are owned by the ‘applicant’ and that written approval to any infringement of the permitted standards will be forthcoming.

Accordingly, I suggest that the application include noncompliance with the permitted construction noise standards at these properties as a reason for consent, and that the applicant provides written approval to these infringements and the construction noise and vibration effects generally.

Yes – the owners of all beachfront dwellings (9, 11, 12, 13, 14, 15 and 16 Glen Isla Place) are members of the Glen Isla Protection Society (GIPS), and they have all provided written approvals. This is why we didn’t assess the levels at their façades. But we have done so in response to this s92 request and included them below (GIPS members coloured grey). Note that we modelled three scenarios, as per the proposed construction plan:

- Rock drop adjacent to 15 Glen Isla Place (the northern-most drop location)
- Rock drop adjacent to 12 Glen Isla Place (the southern-most drop location)
- North end works - tractor arrival and departure, Marooka crawler and excavator works

The predicted noise levels below are for the scenario that generates the highest noise level at 1 metre from the dwelling façades. Predicted vibration levels are in the ground outside the dwelling (rather on the dwellings themselves, because vibration transfer is unknown).

Receiver	Predicted noise level (dB L _{Aeq})	Predicted vibration level (mm/s PPV)
16 Glen Isla Place	72	0.80
15 Glen Isla Place	69	0.65
13 Glen Isla Place	68	0.65
12 Glen Isla Place	68	0.65
14 Glen Isla Place	67	0.65
11 Glen Isla Place	66	0.60
9 Glen Isla Place	64	0.50
8 Glen Isla Place	56	0.55

Receiver	Predicted noise level (dB LAeq)	Predicted vibration level (mm/s PPV)
7 Glen Isla Place	61	0.55
5 Glen Isla Place	59	0.50
3 Glen Isla Place	57	0.50
1 Glen Isla Place	55	0.45
10 Glen Isla Place	58	0.60
6 Glen Isla Place	58	0.55
96 Seaforth Road	53	0.35
4 Glen Isla Place	48	0.55
2 Glen Isla Place	47	0.50

These results show compliance for all dwellings, except 16 Glen Isla Place. This dwelling is owned by the applicant, and written consent has been provided.

Question 4

I understand that the applicant may want to be able to work on Sundays and Public Holidays to take advantage of weather windows and tides. However, the permitted construction noise standards are much lower on these days and consent will be required to exceed these limits. Can the applicant confirm whether works will be undertaken on Sundays and Public Holidays or not, and if so, can MDA address this in terms of compliance and effects on the receivers that have not given written approval?

As set out in Section 4.2 of the application:

'Working hours will be 7am – 5pm, Monday – Friday when enabled by the tide. Work will not be undertaken at night or once daylight becomes unsuitable. However, the work is tidally and storm dependent and work may continue outside working hours for up to three days a week every two weeks. This may include Saturday working outside school holiday periods. No work will take place before 6am or after 8pm.'

Therefore, no work is proposed on Sundays or Public Holidays.

Question 5

Following 1, 2, 3 and 4, I suggest MDA provide a diagram showing all properties on the northern and eastern sides of Glen Isla Place, along with 96 Seaforth Road, to label those that have given written approval to construction noise exceeding the permitted limits, and then label all other receivers with approximate noise level predictions for both the main works, and also for trucks and the excavator traversing the reserve (for the receivers close to the reserve).

See the figures attached to this memo. We have provided a 3D diagram for each of the three scenarios.

Question 6

The MDA memo compares the measured / predicted vibration levels to the DIN4150 standard designed to avoid damage to buildings (including cosmetic damage).

Can MDA please provide a description of the likely effects of vibration on people? This should acknowledge the small sample of the 'rock drop trial' and that it is likely that there could be considerable variation in the levels during the works. (I would expect that there could be some isolated instances where levels could be 100% of those measured). The assessment of effects should also take into account the apparent predominant low frequency (<25Hz) nature of the vibration recorded.

Vibration amenity effects are caused mainly by building owners' concerns about building damage, which we have covered off with our DIN4150 assessment. But we agree that occupants will feel vibration at levels much lower than those that would cause cosmetic damage.

Here is a description of potential effects at various vibration levels. They are generally based on British Standard BS 5228-2:2009 *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*, but we have supplemented them with our own descriptions for 2mm/s and 5mm/s (which weren't provided in the Standard):

- 0.14mm/s PPV Just perceptible in the particularly sensitive environments
- 0.3 mm/s PPV Just perceptible in normal residential environments
- 1 mm/s PPV Typically acceptable with prior notification
- 2 mm/s PPV Clearly perceptible but typically acceptable (during daytime only) in dwellings and workplaces if it occurs intermittently, and with effective prior engagement.
- 5mm/s PPV Highly unsettling in dwellings and workplaces. If prolonged, some occupants may want to leave the building. Computer screens will shake, and items could fall off shelves if they are not level.
- 10 mm/s PPV Likely to be intolerable for any more than a very brief period

In our memo, we predicted 0.7 mm/s PPV at the closest dwelling (9 Glen Isla Place). We agree that there could be considerable variation during the works. So, if we double this value to 1.4 mm/s PPV (and ignore the potential reduction in vibration level as it transfers from the ground into the house structure), we can compare with the effects listed above. This indicates vibration will be clearly perceptible, but typically acceptable with prior notification, particularly if it occurs intermittently (which it will, for the rock dropping activity). We understand that 4 – 5 rock drops a day are planned for 60 to 80 working days.

Regarding the low frequency vibration content, it is not dissimilar to frequencies generated by trains and heavy vehicles, which is to say, familiar to most people. In terms of low-frequency damage risk, we have applied the most stringent PPV value from DIN 4150-3 which, for transient vibration events, applies between 1 – 10 Hz.

Overall, the risk of damage to dwellings is small, and with good communications about the works timing and duration (which we understand is already occurring), any vibration effects on neighbours will be acceptable.

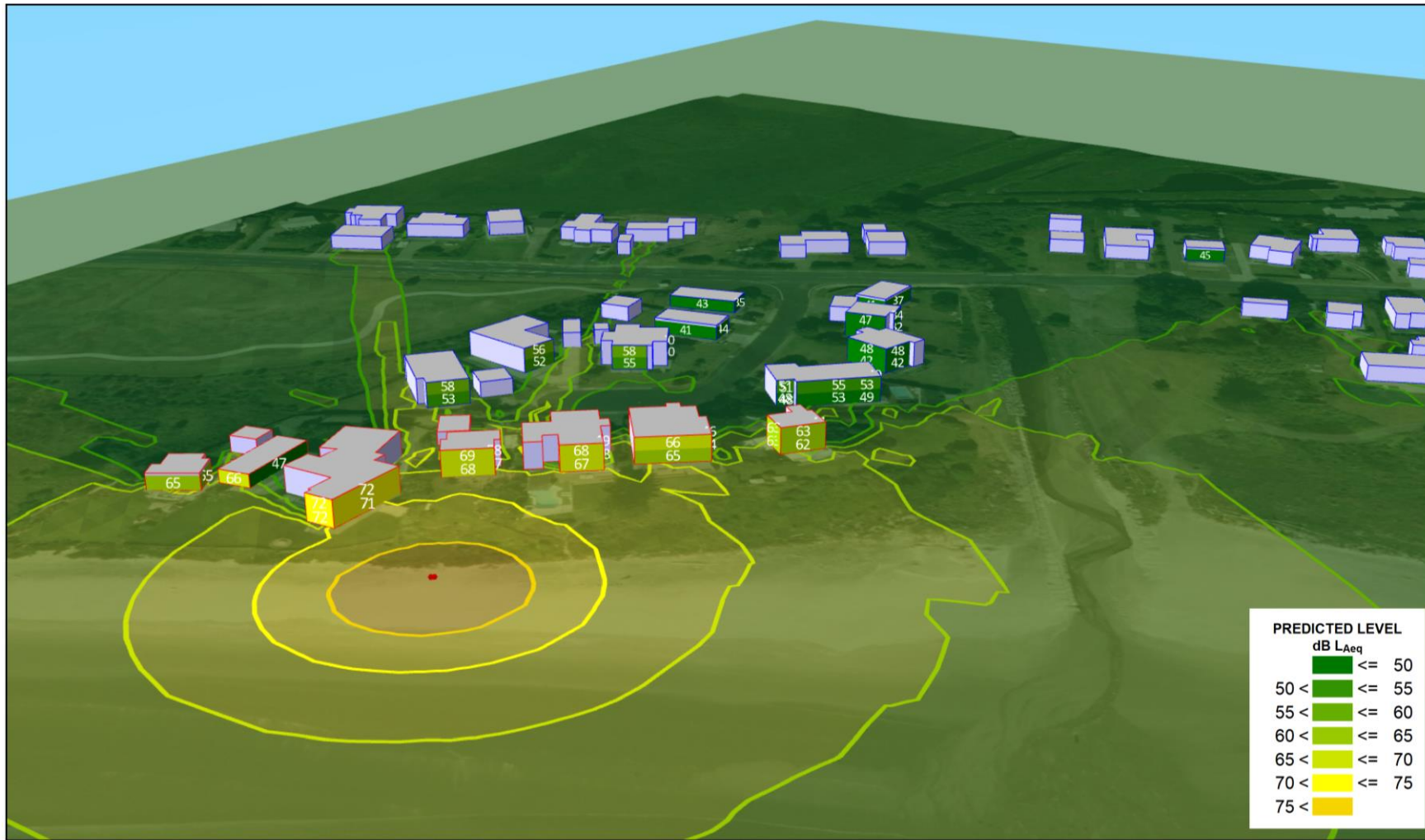
Question 7

The MDA memo states that the excavator movement generated vibration levels of “around 0.2 – 0.4 mm/S PPV” at 7 Glen Isla Place, where the machine was tracking around 32-33m away, and with Three Mile Creek in between. These levels seem high compared to vibration levels in more dense / cohesive soil conditions. Can MDA provide some comment on whether the sandy soil conditions in this area are likely to result in vibration levels that are higher, lower, or similar to vibration levels in other soil conditions such as dense / cohesive soils?

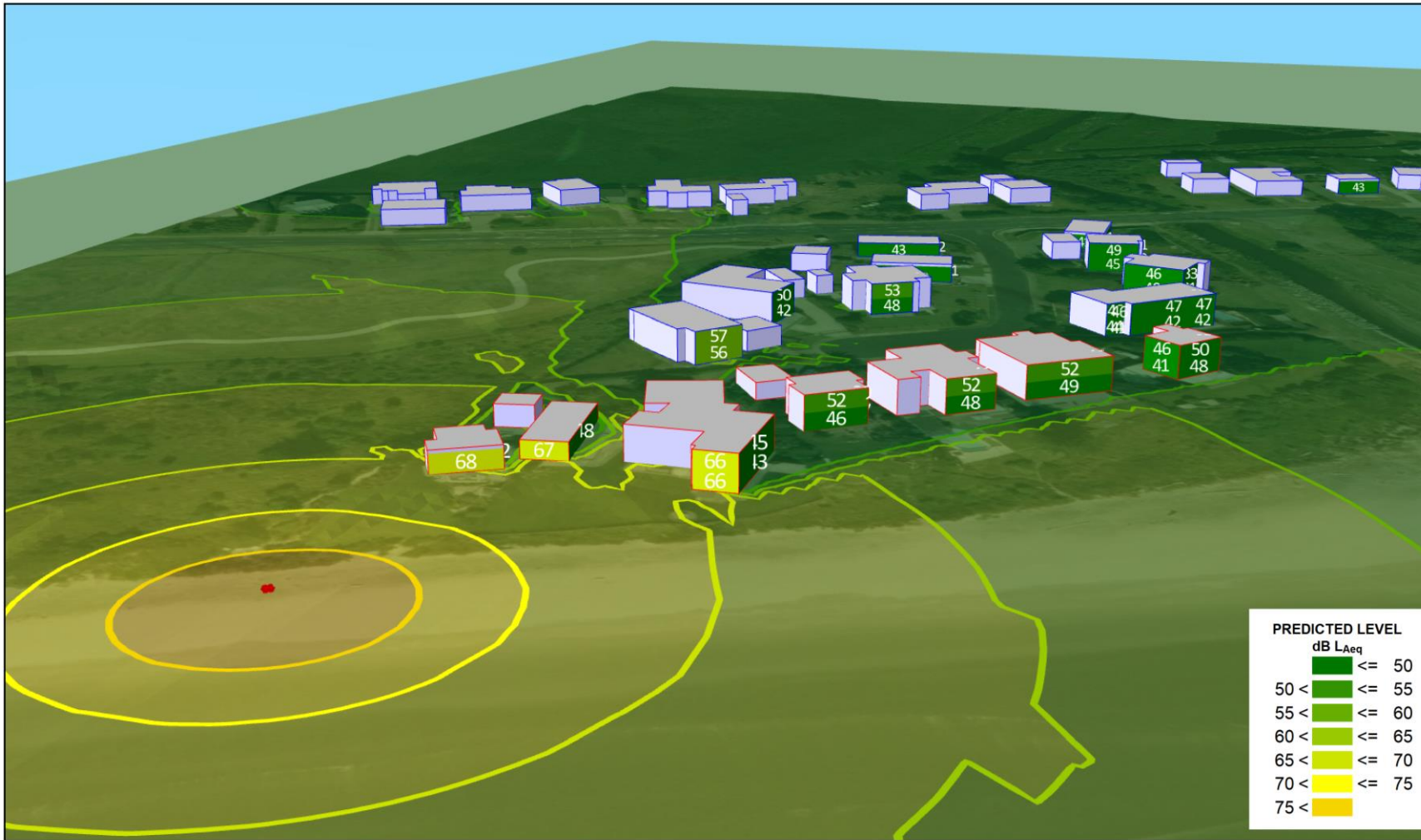
The attenuation with distance was less than we expected in sandy soils, but this wasn't an issue when the levels themselves are as low as we measured. Water content has an appreciable effect on vibration propagation in sandy soils, so the proximity to the creek and ocean, and the rain that occurred at the site several days before our measurements may have had an effect.

Vibration waves that travel downwards (P and S waves, as opposed to surface Raleigh waves) can also reflect off a saturated water table, bringing some vibration energy back to the surface.

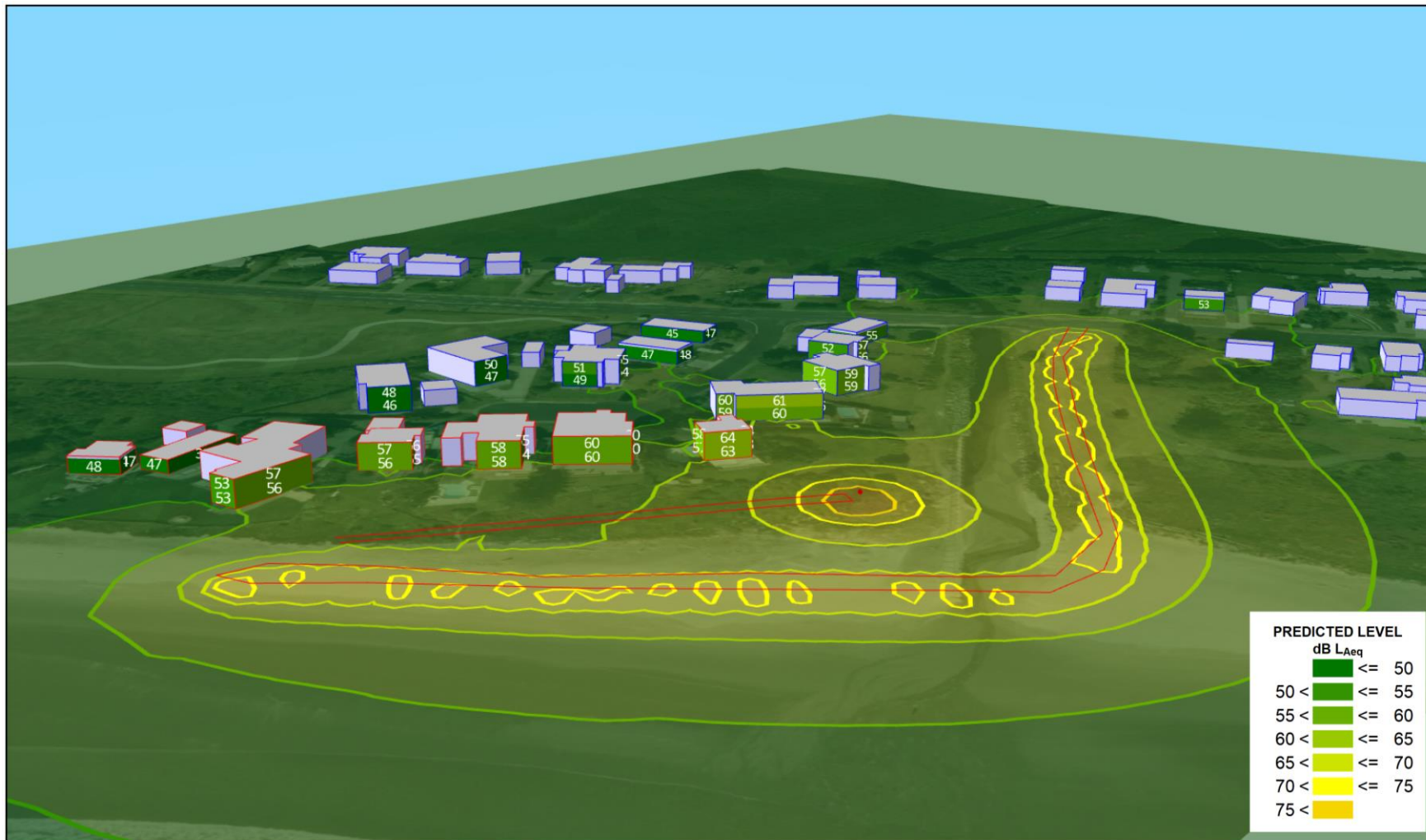
There is no value in commenting on what vibration level would be like in other soil conditions, because only the soil at the site is relevant. Our measurements are the best evidence of its propagation characteristics.










<p>LEGEND</p> <ul style="list-style-type: none"> ● Point Source WA Received Cadastral Boundary — Moving Point Source No WA Received 	<p>Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 001 Run No & Title: 103/FNM S2 Excavator and R File: S2 3D GNM Prediction Height: 1.5 m</p>	<p>Project: Glen Isla Coastal Protection Structure Project number: 20240399 Client name: Glen Isla Protection Society</p> <p>SCALE 0 5 10 20 30 40 m</p>	<p>GLEN ISLA CPS Rock Drop Noise - Drop adj No.15</p> <p>MARSHALL DAY Acoustics</p>
--	--	---	---



LEGEND Point Source WA Received Cadastral Boundary Moving Point Source No WA Received	Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 001 Run No & Title: 104/FNM S3 Excavator and Rc File: S3 3D GNM Prediction Height: 1.5 m	Project: Glen Isla Coastal Protection Structure Project number: 20240399 Client name: Glen Isla Protection Society	GLEN ISLA CPS Rock Drop Noise - Drop adj No.12
	SCALE 0 5 10 20 30 40 m		MARSHALL DAY Acoustics



<p>LEGEND</p> <ul style="list-style-type: none">  Point Source  WA Received  Cadastral Boundary  Moving Point Source  No WA Received 	<p>Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 001 Run No & Title: 1004/FNM S4 Excavator Placi File: S4 GNM Prediction Height: 1.5 m</p>	<p>Project: Glen Isla Coastal Protection Structure Project number: 20240399 Client name: Glen Isla Protection Society</p> <p>SCALE 0 5 10 20 30 40 m</p> 	<p>GLEN ISLA CPS Construction Noise - North End</p> <p>MARSHALL DAY Acoustics </p>
---	--	--	---