

HERNE BAY COLLECTOR

T&T-HBC-RPT-00009_2

HBC MH02 SHAFT RELOCATION S127 NOISE AND VIBRATION ASSESSMENT

Issued for Use

Review and Approval

FUNCTION	POSITION	NAME	SIGNATURE	DATE
PREPARED BY	T&T			04/06/2026
APPROVED BY	Ghella Ltd Social Responsibility Manager	Sandra Edwards	Sandra Edwards - GHELLA LTD Jun 15, 2026, 12:05 PM GMT+12:00	

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Revision Status

REVISION	DATE	STATUS	AMENDMENT DESCRIPTION
2	04/06/2026	For Use	Issued for Use – To be issued to council

Revision changes and reviews are required when significant changes have been made to the document, in particular when in response to comments received from Watercare, changes in contractual or Project requirements need to be reflected, or in response to an incident.

4 June 2026
Job No: 0030552.9089

Ghella Limited
Level 1, 8 Gloucester Park Road
Onehunga
Auckland 1061

Attention: Sandra Edwards

Dear Sandra

Herne Bay Collector s127 application for relocation of Shaft MH02 Noise and vibration effects assessment

1 Introduction

This report has been prepared for Ghella Limited (Ghella) to assess the potential noise and vibration effects associated with the proposed relocation of the Herne Bay Collector Shaft MH02 and the resulting minor amendment to the Herne Bay Collector tunnel alignment. This assessment is provided in support of a section 127 (s127) application under the Resource Management Act 1991 (RMA) to vary the existing resource consent BUN60420393.

We understand that Ghella proposes to relocate shaft MH02 approximately 9.3 m to the north, towards the control chamber (MH01) in the south-west corner of Point Erin Park. The relocation of the shaft also entails a slight change in alignment of the first drive of the tunnel i.e. from a slightly different starting point as shown in Figure 1.1. The relocation is understood to provide construction efficiencies and reduced traffic disruption compared with the originally consented arrangement. In addition, the shaft internal diameter decreases from 13 m to 7 m.

As a result of the shaft relocation, the Herne Bay Collector tunnel alignment has been adjusted. The amended alignment now passes beneath the corner of the property located at 37 Sarsfield Street (also known as 70 Curran Street). At this location, the tunnel is understood to be approximately 13 m below ground, and written approval has been obtained from the affected landowner.



Figure 1.1 MH02 proposed shaft realignment

2 Applicable consent conditions

Works for Herne Bay including MH02 was consented under BUN60420393. The applicable noise and vibration conditions for MH02 have been summarised below.

- **Condition 39** requires that construction noise is measured and assessed in accordance with NZS 6803:1999 Acoustics – Construction Noise.
- In accordance with **Condition 40**, construction noise from the Herne Bay project must comply with the limits in Table 2.1 (**subject to a 5dB reduction**) unless otherwise authorised by an ASCNMP.
- **Condition 44** requires that construction activities comply with the vibration limits set out in the German Industrial Standard DIN 4150-3 (1999) “*Structural Vibration – Part 3 Effects of Vibration on Structures*”. DIN 4150-3:1999 for residential properties is 5 mm/s PPV.

Table 2.1: Construction noise limits

Time of week	Time Period	Maximum noise level (dBA)	
		Leq	Lmax
Weekdays	6.30am-7.30am	60	75
	7.30am-6.00pm	75	90
	6.00pm-8.00pm	70	85
	8.00pm-6.30am	45	75

Time of week	Time Period	Maximum noise level (dBA)	
		L _{eq}	L _{max}
Saturdays	6.30am-7.30am	45	75
	7.30am-6.00pm	75	90
	6.00pm-8.00pm	45	75
	8.00pm-6.30am	45	75
Sundays and Public Holidays	6.30am-7.30am	45	75
	7.30am-6.00pm	55	85
	6.00pm-8.00pm	45	75
	8.00pm-6.30am	45	75

3 Noise and vibration assessment

3.1 Assessment approach

The construction methodology remains the same as consented, with secant piling of the shaft and tunnelling using a TBM. As such the previous construction noise and vibration technical assessment (CNVTA)¹ has been used to inform this assessment of the change in noise and vibration effects from the relocated shaft and tunnelling construction effects.

With the shift of MH02 (Shaft 1 in the CNVTA) north out of the road reserve and further into Point Erin Park and the reduction in shaft size, construction moves noticeably further away from receivers along Sarsfield Street but slightly closer to Curran Street receivers. The 3D noise model using the same parameters as per the CNVTA was updated with the smaller diameter shaft and location and rerun to calculate predicted noise levels.

3.2 Predicted levels and effects

3.2.1 Surface construction – shaft MH02 noise

Predicted noise levels at receivers that may exceed 70 dB LAeq are provided in Table 3.1 and Figure 3.1. Only receivers predicted to exceed 70 dB LAeq are included.

Table 3.1: Comparison of previous and updated predicted noise levels at receivers with exceedances

Address	Previous predicted noise level, dB LAeq	Updated MH02 predicted noise level, dB LAeq	Difference
37 Sarsfield Street	72	73	+1
72 Curran Street	70	72	+2
30 Sarsfield Street	78	73	-5
28 Sarsfield Street	76	72	-4
26 Sarsfield Street	72	69	-3

¹ T+T (June 2023). Herne Bay Tunnel – Construction noise and vibration technical assessment, Report. Ref: 1090120.3000 v1.

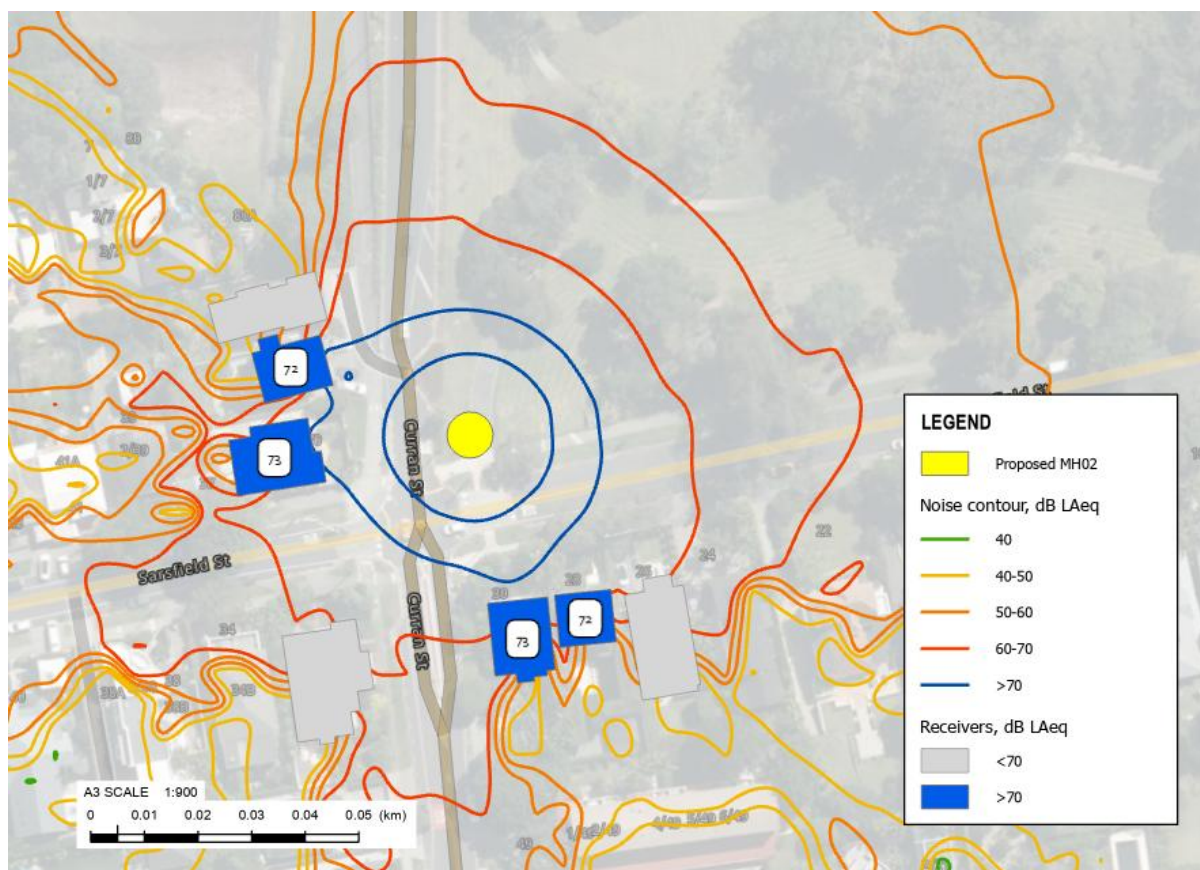


Figure 3.1 Predicted noise level at receivers and noise contours at MH02

The updated predictions indicate four receivers are anticipated to experience noise levels above the 70 dB LAeq daytime construction noise limit, with the maximum level of 73 dB LAeq predicted at 30 Sarsfield Street and 37 Sarsfield Street. A noise level of 73 dB LAeq for shaft construction at this location is considered acceptable for this type of work.

While the number of receivers predicted to exceed 70 dB LAeq remains unchanged from the consented design, the northward shift and reduced size of MH02 results in reduced noise effects:

- The maximum predicted noise level has reduced notably by 5 dB, from 78 dB LAeq to 73 dB LAeq at 30 Sarsfield Street.
- Reduced levels at 28 Sarsfield Street (76 to 72 dB LAeq) and 26 Sarsfield Street (72 to 69 dB LAeq).

Two receivers experience a minor increase of 1 – 2 dB. However, changes of this magnitude are negligible and are typically not a perceptible change to occupants.

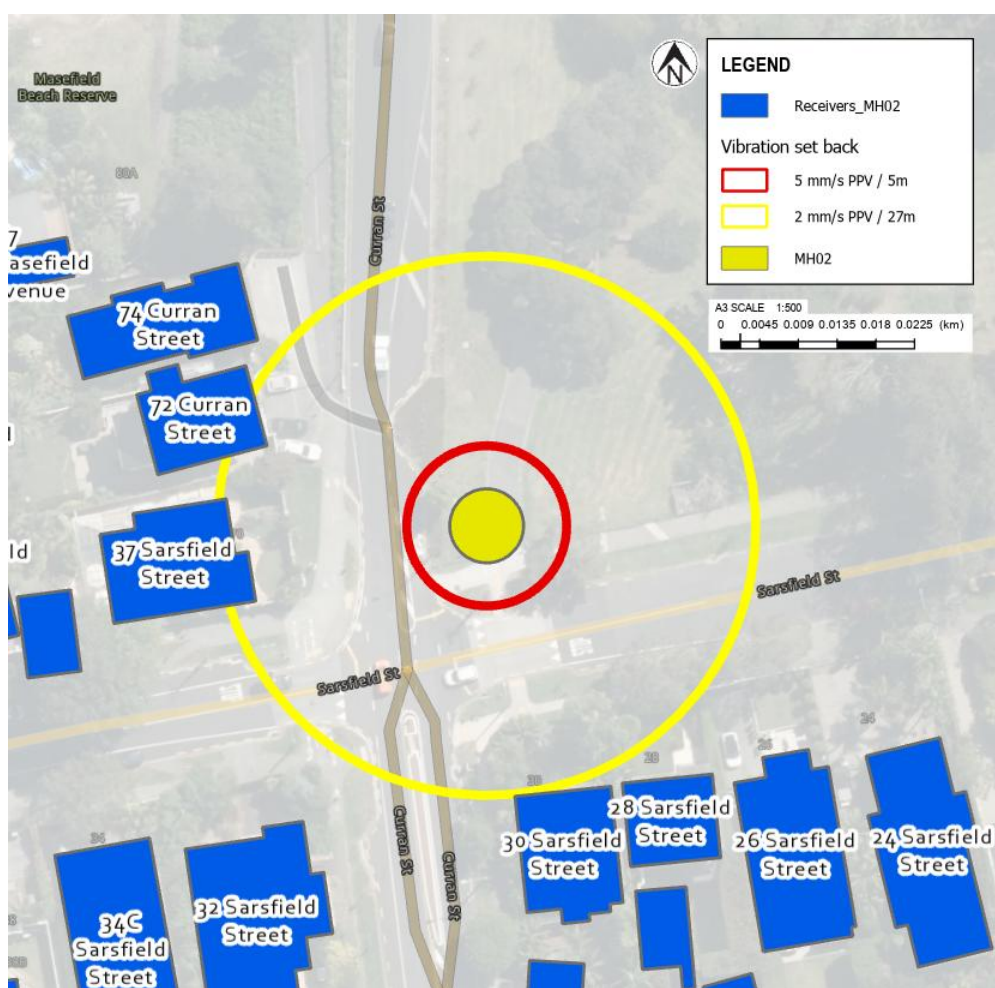
Overall, the shaft relocation results in a net positive effect for noise-sensitive receivers with no additional predicted exceedances.

3.2.2 Surface construction – vibration

Predicted vibration levels have been assessed in accordance with the CNVTA for the nearest receivers most affected by the relocation of MH02. Predictions are based on the most vibratory equipment likely to be used (excavator with breaker attachment). Results are provided in Table 3.2 and vibration contour in Figure 3.2.

Table 3.2: Comparison of previous and updated predicted vibration levels at receivers

Address	Previous predicted vibration level, mm/s PPV	Updated MH02 predicted vibration level, mm/s PPV	Difference
37 Sarsfield Street	2 – 3	2 – 3	No change
72 Curran Street	1 – 2	2 – 3	Increase
30 Sarsfield Street	2 – 3	2 – 3	No change
28 Sarsfield Street	2 – 3	1 – 2	Decrease
26 Sarsfield Street	2 – 3	1 – 2	Decrease

*Figure 3.2 Vibration setback to achieve amenity and DIN 4150-3 at receivers*

The updated predictions indicate that three receivers are anticipated to experience vibration levels above the 2 mm/s PPV amenity criteria, a reduction from the consented design.

The primary change is at 72 Curran Street, where the predicted vibration level range increases from 1 – 2 mm/s PPV to 2 – 3 mm/s PPV. However, this increase is negligible and remains within the envelope of effects assessed in the CNVTA and can be appropriately managed through stakeholder engagement and implementation of the CNVMP.

No exceedances of the DIN 4150-3:2016 building damage criteria are anticipated at any receiver.

3.3 Tunnelling – vibration

The northward shift of MH02 by 9.3 m results in a minor change to the tunnelling alignment in this area. The revised alignment now passes underneath the southeast corner of the property at 37 Sarsfield Street at a depth of approximately 13 m below ground, whereas the consented alignment did not directly pass beneath this property. Applying the ground attenuation relationship developed and validated for Watercare infrastructure projects across Auckland, the predicted vibration level at 37 Sarsfield Street is approximately 0.2 mm/s PPV when the TBM passes directly beneath the property.

The predicted vibration level of 0.2 mm/s PPV will comply with the daytime amenity limit of 2 mm/s. While tunnelling will not be undertaken at nighttime, we note that it will also comply with the most stringent night-time AUP amenity criterion of 0.3 mm/s PPV and remain well below the DIN 4150-3:2016 cosmetic damage criteria for residential structures. At 0.2 mm/s PPV, vibrations are likely to be imperceptible within residential environments. Given the expected TBM advance rate of approximately 10 – 20 m per day, the duration of vibration experienced at 37 Sarsfield Street would be limited to approximately 1 – 2 days as the TBM passes beneath the property.

The change in alignment represents a very minor change to the tunnelling effects assessed in the consented design. Effects will be managed in accordance with the CNVMP, including pre-condition surveys where required, real-time vibration monitoring, and communication with residents prior to tunnelling beneath the property. Overall, vibration effects from tunnelling at 37 Sarsfield Street are expected to be negligible and consistent with the consented project effects.

3.4 Tunnelling – regenerative noise

The regenerated noise threshold of 35 dB LAeq is typically adopted where night-time works (for sleep disturbance) are anticipated and is not directly applicable to daytime works.

Tunnelling will not be undertaken at nighttime. Ground-borne noise from daytime tunnelling works is unlikely to be noticeable above normal day-to-day indoor activities and remains within the same envelope of effects as presented in the consented project effects.

4 Summary and conclusions

This assessment evaluates the noise and vibration effects associated with relocating shaft MH02 approximately 9.3 m northward and the resulting minor tunnel alignment adjustment.

4.1 Key Findings - Noise

- The number of receivers predicted to exceed a noise level of 70 dB LAeq remains unchanged from the consented design.
- Minor increases of 1 – 2 dB are predicted at 37 Sarsfield Street and 72 Curran Street. Changes of this magnitude are negligible and are typically not a perceptible change to occupants.
- The northward shift and reduced size of MH02 results in reduced noise effects:
 - The maximum predicted noise level has reduced notably by 5 dB, from 78 dB LAeq to 73 dB LAeq at 30 Sarsfield Street.
 - Reduced levels at 28 Sarsfield Street (76 to 72 dB LAeq) and 26 Sarsfield Street (72 to 69 dB LAeq).
- Overall, the shaft relocation results in a net positive effect for noise-sensitive receivers.

4.2 Key Findings - Vibration

- The updated predictions indicate that three receivers are anticipated to experience vibration levels above the 2 mm/s PPV amenity criteria, a reduction from the consented design.
- There is no change to predicted vibration levels at 30 and 37 Sarsfield Street (2 – 3 mm/s).
- Predicted vibration levels at 26 and 28 Sarsfield Street reduce to 1 – 2 mm/s.
- The predicted vibration level range at 72 Curran Street increases from 1 – 2 mm/s PPV to 2 – 3 mm/s PPV. However, this increase is negligible and remains within the envelope of effects assessed in the CNVTA and can be appropriately managed through stakeholder engagement and implementation of the CNVMP.
- No exceedances of the DIN 4150-3:2016 building damage criteria are anticipated at any receiver.
- The new alignment passes beneath 37 Sarsfield Street at 13 m depth with a predicted vibration of 0.2 mm/s PPV and is likely imperceptible.
- Regenerated noise is unlikely to be noticeable above normal day-to-day activities.

The proposed changes are within the consented effects envelope and deliver an overall net positive outcome, and effects can be managed through the approved CNVMP. The relocation is acceptable from a noise and vibration perspective, consistent with the consented project and can meet consent conditions.

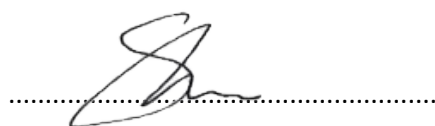
5 Applicability

This report has been prepared for the exclusive use of our client Ghella Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report may be provided to Auckland Council for use in undertaking its regulatory functions in connection with the Herne Bay Collector consents.

Tonkin & Taylor Ltd

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Authorised for Tonkin & Taylor Ltd by:



Karen Baverstock
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Report reviewed by Darran Humpheson (Technical Director - Acoustics).

4-Jun-26

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