

MalcolmHuntAssociates



Telephone 04 472 5689 Fax 04 473 0456

mha@noise.co.nz www.noise.co.nz

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The Manager,
Timaru District Council

Attn: Loren Brown, Senior Planner

Proposed Timaru District Plan Noise Provisions Review of Port Noise Report & Noise Contour Recommendations

Timaru District Council has engaged Malcolm Hunt Associates (MHA) to review the methodology and findings of “*PrimePort Timaru - Port noise contours*” report number: AC18314 – 05 – R1¹ by Acoustic Engineering Services (AES) engaged by PrimePort Timaru to develop port noise contours in accordance with NZS6809:1999 *Acoustics – Port Noise Management and Land Use Planning* for consideration by Council for adopting into the Proposed Timaru District Plan.

General

The port of Timaru is a nationally significant asset providing a vital sea link to other centres and internationally. PrimePort operates a full break-bulk handling facility providing the region with significant freight forwarding and receival services operating 24 hours a day. Currently the Operative District Plan (Part B Chapter 12) refers to “Port of Timaru Limited” as a significant noise source however there are no specific policies or rules aimed at managing the effects of port noise. Instead, the provisions of the Industrial H apply to activities at the port however this does not include noise from vessels at berth (which are covered by the Regional Coastal Plan) nor does the district plan contain any provisions to address potential reverse sensitivity noise effects on port operation.

The Proposed District Plan (under development) seeks to minimise conflict between higher noise emitting activities and other more noise sensitive land uses, through controls on what activities are encouraged or limited in different zones, through setting noise limits and through mitigation measures such as acoustic insulation of dwellings in noise affected areas. Under the draft district plan, Port activities are provided for under the General Industrial Zoning applied to the port area. The National Planning Standards places requirements on any new district plan to adhere to a specified (generic) District Plan Structure and includes a requirement that rules to manage an emission of noise must be consistent with the recommendations of the relevant New Zealand Standard for the type of noise under consideration. In relation to noise from port activities, this is covered by NZ Standard NZS6809:1999 *Acoustics – Port Noise Management and Land Use Planning*.

Port Noise Standard

NZS6809:1999 was specifically developed for the management of port noise and the application of appropriate land use planning techniques to ensure the long-term compatibility of ports and their neighbours. NZS6809:1999 has been adopted into many other District Plans. It recommends that:

- Limits be set on the emission of noise from the port (in the long term) at a noise boundary that can be justified based on current and future port activities ; and
- Land use planning measures be adopted to manage the effects of port noise in noise sensitive areas within the contour area.

¹ Dated 11 February 2022.

NZS6809:1999 utilises noise contours (referred to as inner and outer control boundaries) as means of managing and port noise and controlling new noise-sensitive activities establishing within noise-affected areas (as depicted by the port contours). The inner control boundary sets noise limits within which it is undesirable to develop noise sensitive activities such as residential uses. Between the inner and outer control boundaries new noise-sensitive activities and alterations or additions to existing buildings used for noise-sensitive activities should be permitted activities, subject to conditions requiring that they be adequately insulated from port noise. Beyond the outer control boundary specific controls for any noise sensitive use are considered to be unnecessary.

The AES Report

PrimePort Timaru engaged acoustic consultants AES to develop noise contours in accordance with NZS 6809:1999 for consideration for adopting into the Proposed District Plan to improve the sustainability of the port and to deal with potential reverse sensitivity noise issues that may develop in the future around noise emitted from the port. This report evaluates the process and methodology used by AES to develop the port noise contours and subsequent port noise boundaries for possible inclusion in the Proposed District Plan. This review only considers the basis of the predicted port noise contours and conformance with the recommendations of NZS6809:1999 in this regard. It does not cover the wording of noise rules or land use planning requirements for use in the Proposed District Plan.

Section 2 of the AES report describes the nature of existing port activities and outlines the methods adopted to measure levels of noise currently occurring in the port. It explains these measurements were taken for the purpose of quantifying the range of existing noise sources currently found within the port for use in computer noise predictions of maximum levels of noise expected to arise from current activities undertaken within the existing port. It is important to note measurements were taken within the port, at proximal distance to operating machinery. Measurements of cumulative port noise due to existing activities were not undertaken at receiver sites beyond the port itself. This limits the assessment of how future port noise (based on the noise contours recommended within the AES report) may compare to existing levels of port noise experienced in nearby receiver areas.

Port Noise Predictions

The prediction of future cumulative noise emitted due to port activities is a requirement when adopting the methods of NZS6809:1999 so that noise contours (and associated noise limits and land use planning controls) are based on a rational assessment of future activity. In this case, the AES report considered future planned development over the next 10 years with PrimePort indicating likely future developments being;

- Demolition of the No.3 wharf, and the extension of the North Mole wharf to the south creating an additional berth on the North Mole Wharf for steel and container handling.
- A proposed new wharf at Evans Bay, to be used for bulk product handling.

These possible port developments are shown in Figure 3.1 of the AES report which sensibly points out that while these future development projects are at various stages of planning, they are dependent on the materialisation of projected growth in demand for import and export services at Timaru Port. We support the approach of the AES report to base future port noise contours on existing port noise levels with additional noise to be included from reasonably likely future developments. This is consistent with the recommendations of NZS6809:1999 (clause 6.2.2) and is supported on this basis.

Section 4 of the AES report covers the methods adopted for noise modelling including how the effect of the shape of terrain surrounding the report has been taken into account when predicting the shape of noise contours. Characteristics of the individual noise sources modelled are given in tables 4.2 through 4.6 which includes details of various noise sources associated with container handling (including “banging during loading) and noise sources associated with steel handling, cement unloading, handling of bulk products including log handling and activities associated with fishing vessels at the port. Importantly, the activity levels are assessed based on 24 hour activity with overall activity levels assessed over 5 days. This is consistent with clause 6.4.5 of NZS6809:1999 which is reproduced as follows;

6.4.5

For the purposes of predicting the extent of land affected by port noise, the assumptions about sound emissions for the port under consideration should allow for the fact that the predicted contours are the energy average of the daily L_{dn} for 5 consecutive busy days.

The various port noise sources are quantified in terms of sound power levels for each significant source. The sources modelled include mobile sources operating within the port such as logging trucks and trains. Although no sound spectra (indicating frequency content) have been provided in the report, tables 4.2 through 4.6 describe the ways in which the sound spectra for various sources have been included in the modelling.

The modelling has been carried out in terms of Level “day-night” (L_{dn}) where daytime is defined as 7:00am to 10:00pm, and night time is defined as 10:00pm to 7:00am. These times correlate to the definition of L_{dn} used for prediction of night-weighted sound exposure in NZS6809:1999. Although NZS6809:1999 requires consideration of night time noise levels measured as “ L_{Max} ” these units are not needed when formulating port noise contours under the recommendations of this Standard².

Modelling Results

Port noise predictions are provided in the AES report for two scenarios:

- A. “Existing full port scenario” with the following ships assumed to be in port;

NMW, outer berth	NMW, inner berth	No. 1 wharf	No. 1 Extension wharf	No. 2 wharf	No. 3 wharf	TCT wharf extension	Evans Bay wharf
Container	Steel	Fishing, bulk product	Bulk product	Cement	Fishing	-	-

- B. “Future full port scenario” with the following ships assumed to be in port;

NMW, outer berth	NMW, inner berth	No. 1 wharf	No. 1 Extension wharf	No. 2 wharf	No. 3 wharf	TCT wharf extension	Evans Bay wharf
Container	-	Fishing, bulk product	Bulk product	Cement	(demolished)	Combined container and steel ship	Bulk product

It is noted the existing full port scenario does not include log vessel or log handling at Evans Bay wharf however this appears to be included in the future full port scenario (which is the scenario on which future port noise contours are based, these being the basis of district plan port noise contours recommended by AES).

Modelling Results

Predicted L_{dn} noise contours labelled “All sources, existing full port scenario” are found at Appendix 1.1 of the AES report and are set out below in Figure 1.

² NZS6809:1999 envisages L_{max} levels arising from port activities during night time periods will be included within the noise rules to be developed within the port noise provisions of the Proposed District Plan.



Figure 1 “All sources, existing full port scenario” as found at Appendix 1.1 of the AES report

Predicted Ldn noise contours labelled “All sources, future full port scenario” are included at Appendix 1.2 of the AES report, a copy of which is set out below.



Figure 2 “All sources, future full port scenario” as found at Appendix 1.2 of the AES report.

A comparison of the above two contour plots indicates the Ldn noise contours are located slightly further from the port area under the future scenario signifying an increase in Ldn noise emission. The degree of increase appears to be in the order of 1 to 3 dB. Notably, high levels of noise (>70 dB) remain contained within the port area (currently zoned Industrial H) under the future scenario.

Proposed Port Noise Contours

The implementation of NZS6809:1999 approach to managing port noise and compatible land use planning within noise affected areas is based on two mapped noise contours;

- **Inner Control Boundary** – a mapped contour line within which the highest levels of future port noise levels are experienced. This is the area contains the highest port noise levels of Ldn 65 dB or greater. This contour is used as the location at which compliance with prescribed district plan limits on port noise are assessed. As the area most affected by port noise, future noise sensitive developments are not generally recommended to be permitted within the Inner Control Boundary; and
- **Outer control boundary** – a mapped contour indicating the extent of sites experiencing significant port noise to the extent that noise sensitive developments may proceed providing steps to mitigate the effects of future port noise indoors within buildings housing sensitive uses are taken (such as acoustic insulation of dwellings). Whereas the outer control boundary is normally based on levels of future port noise measuring between Ldn 65 dB and Ldn 55 dB, the AES report recommends this area be defined as the area affected by future port noise levels ranging from Ldn 65 to Ldn 57 dB. This departure from the generic recommendations of NZS6809:1999 is supported in the case of Timaru port as the areas of land affected by port noise between Ldn 55 dB and 57 dB lie within the CBD or are highly affected by noise from the state highway or designated railway activities. As such, port noise at levels between Ldn 55 dB and 57 dB are likely to be exceeded by other commercial or transport-related activities³. On this basis, we accept the maximum extent of the Outer Control Boundary extending to Ldn 57 dB instead of Ldn 55 dB recommended within NZS6809:1999 is supported as a justifiable departure from the Standard.

The locations recommended in the AES report for the Inner Control Boundary and the Outer Control Boundary are based on predicted maximum future port noise (Figure 2 above and Appendix 1.2 of the AES report). The actual sound level contours have been corrected to run along property boundary, where possible which is supported as best practice for noise contours overlaid over maps of urban environments. The recommended location of the Inner Control Boundary and the Outer Control Boundary are set out below in Figure 3 (based on Appendix 1.3 of the AES report);

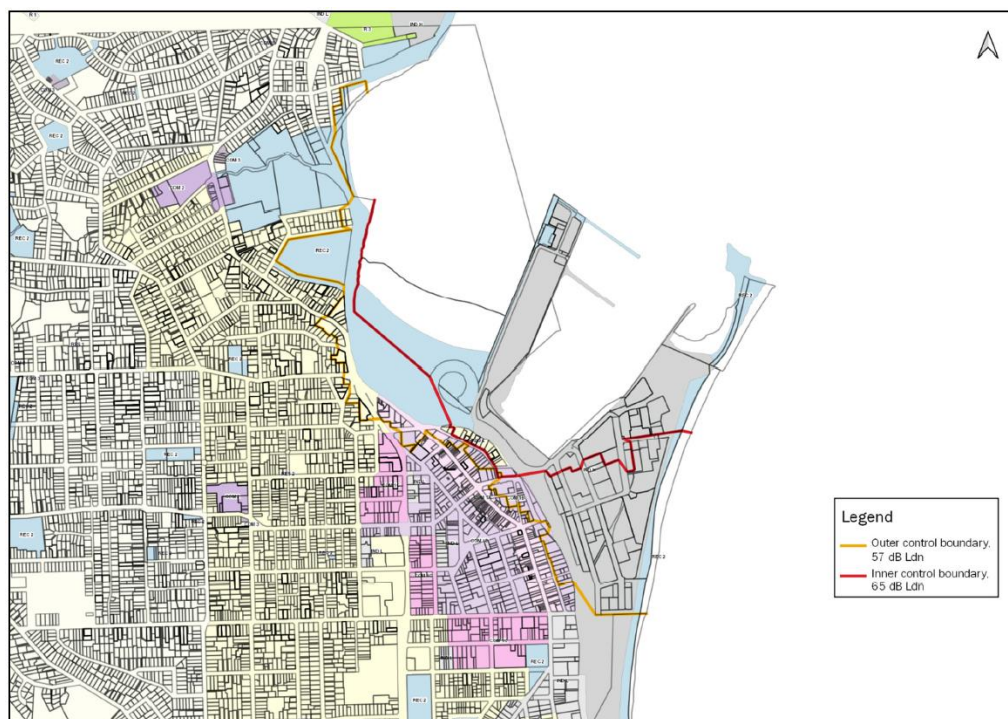


Figure 3 Location of inner and outer control boundaries, as found at Appendix 1.3 of the AES report.

³ Consistent with best practice, the Draft District Plan includes reverse sensitivity measures such as setbacks and acoustic insulation of buildings housing noise sensitive activities within these areas affected by transport noise. Extending the outer noise contour to Ldn 55 dB therefore offers little benefit in terms of the protection of the port against reverse sensitivity noise effects.

Summary & Recommendations

In summary MHA have reviewed recommendations of a report “PrimePort Timaru - Port noise contours” by AES who have been to develop port noise contours in accordance with NZS6809:1999 for consideration by Council for incorporating into the Proposed Timaru District Plan.

The port noise contours have been reviewed in terms of the basis of the predictions undertaken by AES and the way in which future port developments have been considered. We have based the review on methods for formulation of port noise contours recommended within NZS6809:1999.

This review has not considered the wording of port noise rules or policies or examined any specific noise emission limits for port activities, nor has this review considered the type of land use planning rules that may be applied within the contour areas to address reverse sensitivity noise effects on the operation of the port. Wording of these rules and policies covering these matters will be fully reviewed as part of the Proposed District Plan planning process.

The port noise contours on which Proposed District Plan port noise provisions are proposed to be based are set out above in Figure 3 (Appendix 1.3 of the AERS report). Our review supports the basis of the AES noise predictions and methods used to develop these noise contours put forward for inclusion in the Proposed District Plan. We find no technical problems or omissions within the procedures used to develop these contours and therefore support their inclusion in the Proposed District Plan⁴. We support the maximum extent of the Outer Control Boundary to levels of Ldn 57 dB as this offers several practical benefits compared to extending these contours out to Ldn 55 dB as per the generic recommendations of NZS6809:1999.

We recommend the following be considered when developing the full suite of port noise emission limits and port noise reverse sensitivity land use planning controls in the Proposed District Plan;

- a) Primeport (or its agents AES) provide a meaningful comparison of existing ambient sound levels found within areas near the port with future levels of expected port noise (as signalled by the locations of the contours set out in Figure 3 above).
- b) A consideration of future LMax noise levels likely to be received within areas surrounding the port (port noise has only been considered in the AES report in terms of port noise measured as 5 day exposure levels using the Ldn unit).
- c) Consideration of any recommended acoustic insulation requirements within the port noise affected areas should be made consistent with acoustic insulation standards set out within Rule NOISE-R8 (Acoustic insulation of new buildings for use by a noise sensitive activity and alterations to existing buildings for use by a noise sensitive activity).

Please advise if you require any further information.

Yours sincerely,

MALCOLM HUNT ASSOCIATES

per



Malcolm Hunt

B.Sc., M.E.(mech), Dip Public Health

⁴ While we support the basis of the AES port noise modelling, we have not ourselves modelled port noise. If necessary, the district plan process may require AES to provide further evidence or details to support the locations of the recommended port noise contours set out in the report we have reviewed.