Chiles Ltd

1 May 2018
Ref: 180801

Timaru District Council

By email: hayden.blackler@timdc.govt.nz

Dear Hayden

Subject: RC.102.2018.78.1 Timaru Hospital Helipad - Acoustics comment

Introduction

Chiles Ltd has been engaged by the Timaru District Council to review acoustics aspects of an application for resource consent to relocate a helipad from the Timaru Botanic Gardens where it serves the adjacent Timaru Hospital, to a new location within the Timaru Hospital site. This review has been made on a desk-top basis from review of the operative district plan and:

- Assessment of environmental effects (AEE), Anderson & Co, dated 13 April 2018,
- Assessment of helicopter noise, Marshall Day Acoustics (MDA), dated 9 April 2018.

The author is not familiar with the site and has based observations in part on inspection of aerial photographs.

The AEE and MDA report do not discuss potential disturbance from helicopter sound in the wards of the hospital itself. As this noise effect occurs within the application site it has not been considered further in this review. However, it is noted the location of the helipad could give rise to significant adverse noise effects within hospital wards.

District Plan

Section 4 of the MDA report correctly identifies rule 6.21.2.4 of the operative district plan, which specifically addresses noise from helicopters. This rule only applies to helicopter operations within the scope of NZS 6807. We agree the application for this helipad is within the scope of NZS 6807 as:

- There are more than 10 movements a month on average,
- Regardless of any variation in the number of movements, the specified noise thresholds in NZS 6807 clause 1.1 are exceeded by a significant margin, and
- The potential restriction of the standard with respect to emergency operations is only stated in a commentary clause of the standard, which is not a normative (mandatory) part of the standard.

NZS 6807

MDA adopts the 50 dB L_{dn} noise limit from NZS 6807. This criterion has an identical meaning to the "Edn" criteria also in NZS 6807. At the time NZS 6807 was drafted there were different opinions in New Zealand as to the best way to express noise limits, so two alternative ways (Edn/Ldn) were

provided to express the same criteria. Since that time, all New Zealand practitioners now follow the international norm of Ldn; so Edn is no longer used.

MDA correctly identifies that sleep disturbance is likely to be the critical noise effect. MDA discusses the 70 dB L_{AFmax} criterion from NZS 6807 but essentially dismisses it in favour of a substantially more lenient 95 dB L_{AE} criterion. While 95 dB L_{AE} has previously been recommended as a criterion by MDA and used at some other airports, it is not a standard value. There is significant ongoing research into sleep disturbance from noise as recently summarised in *WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep, International Journal of Environmental Research and Public Health 2018, 15, 519*. Such research indicates greater sleep disturbance from aircraft noise than the older 1997 report cited in the MDA report. As such, it is considered that 70 dB L_{AFmax} as recommended by NZS 6807 should be used as a criterion to assess sleep disturbance effects.

Predicted sound levels

Section 5 of the MDA report sets out predicted sound levels. The predictions are based on DIN 45684-1:2013, which is not a method we are familiar with and are not aware of it being used in New Zealand previously. The MDA report does not set out input data in the model so that could not be reviewed.

Despite the potential uncertainty with the modelling data and method, the results are within an expected range, and sufficient for assessing noise effects. The results require adjustment to estimate L_{AFmax} values from the L_{AE} values stated and plotted in Appendices B2 and B3. MDA estimates that around 1000 houses are exposed to more than 70 dB L_{AFmax}.

Potential noise effects

MDA contend that noise exposure is in effect moved from one place to another and the net effect is essentially neutral or even positive. We disagree, as houses that are already exposed may have been constructed or adapted to address that existing exposure, and residents may have habituated to some extent. This will not be the case for houses with greatly increased exposure where residents may experience significant disturbance.

In general, we agree the potential daytime noise effects are limited by the relatively small numbers of flights that occur. This would hold true even if the number of flights as much as say doubled from the 74 flights that occurred in 2017. Each helicopter event will be clearly audible across a wide area and may cause temporary disturbance, particularly at the nearest houses, possibly interfering with concentration, relaxation and communication. Due to the short and infrequent nature of this disturbance it should be acceptable for most people during the day, but this may depend on the sound insulation, layout and use of the nearest houses with the highest exposure.

Night-time helicopter sound is likely to cause sleep disturbance over a wide area. Due to the infrequent nature of such disturbance it may be considered reasonable in the context of medical emergencies. However, the effect could be significant at some houses, including at houses over a wider area than identified by MDA.

Mitigation/conditions

The selected helipad location is close to residential properties, which is undesirable in terms of noise management. From the AEE it is understood an evaluation of alternative locations has been conducted

but other options are not practicable. It is accepted that altering the proposed location of the helipad is not a practicable option to reduce or manage noise exposure.

The proposed flight paths reduce noise exposure at houses as the initial stages pass over the Timaru Botanic Gardens.

Given the function of this helipad, it is not considered appropriate to set a limit on movement numbers or helicopter type. Likewise, it is not appropriate to set noise limits, as they would in essence have the same effect. The helipad should however be limited to medical use and should not be allowed to be a base for helicopters.

The MDA report does not set out whether screening of the helipad has been assessed, or whether it would be acceptable in terms of aviation safety. While a barrier would not alter the sound of helicopters in flight, it could reduce the overall exposure at the most affected houses opposite. The practicability of a noise barrier on the boundary of High Street should be investigated. A barrier would need to be a significant height to effectively screen a helicopter on the ground.

If there are residual adverse effects that would occur due to the particular design, construction or use of neighbouring houses then those effects may need to be mitigated through treating individual buildings. This would require further investigation.

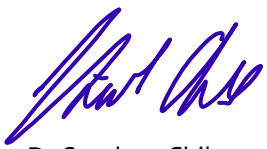
Conclusions

NZS 6807 is an appropriate standard for consideration of the proposed helipad. Both the 50 dB L_{dn} criterion and the 70 dB L_{AFmax} criterion should be considered. The MDA modelling could not be reviewed but the results are in the range expected. This shows the nearest houses would be exposed to more than 50 dB L_{dn} and around 1000 houses would be exposed to more than 70 dB L_{AFmax}. For some of these houses this exposure is existing but for numerous houses there would be significantly increased exposure and potential disturbance.

Given the relatively low usage of the helipad and the essential function it serves for the community, the effects are likely to be acceptable to most people. However, screening of helicopters on the ground should be investigated and some of the nearest properties may require treatment to avoid undue sleep disturbance. There are likely to be more than minor adverse noise effects at a large number of houses.

Yours sincerely

Chiles Ltd



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