

30 July 2018

Logic Group
246 High St, Christchurch Central
Christchurch 8011

Attention: Julie Perkins

Dear Julie

TIMARU HOSPITAL HELICOPTERS

I refer to your email received 5 July 2018. I understand that Hayden Blacker of Timaru District Council has requested that noise from the helicopter be assessed when not in flight (i.e. assessed only during ground based activity).

I have carried out this assessment using the methodology set out below:

- Sound emissions have been calculated for a MMB/BK117 helicopter.
- Source data for the helicopter has been obtained based on a set of measurements performed of the Westpac Rescue Helicopter operating in Hagley Park Christchurch. The analysis has been based on a measured noise level of 99 dB L_{AFmax} at 25 metres¹. This was the loudest “fast A-weighted maximum” noise level measured over three movements (two departures and one arrival). Measurements performed during other movements showed noise levels between 2 to 4 dB quieter than the source data. The sound power spectrum used in calculations is given in Appendix A.
- The data we have used for our analysis of ground based activity is based on a noise measurement performed of a helicopter arrival. Some flight activity is included in the measurement. It is possible that the L_{AFmax} noise level occurred while the helicopter is still in flight (but likely close to the ground). A BK117 will generally start to power down soon after landing, however there will be a short period of time where the on-ground noise level is equivalent to the noise immediately prior to landing. It is considered that the data used is unlikely to be overly conservative, however it is noted that the ground idle noise levels will be significantly lower than the levels used for this assessment.
- Noise levels have been calculated using ISO 9613-2:1996 "*Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*" rather than the previously used *DIN45684-1:2013 Acoustics - Determination of aircraft noise exposure at airfields - Part 1: Calculation method*. The DIN standard is intended to include noise from aircraft in flight.

The L_{AFmax} noise levels from ground based helicopter operations are shown in the appendices as follows:

- **Appendix B:** This figure shows an overlay of the L_{AFmax} noise levels from both the proposed and existing landing pads. The figure illustrates three noise categories:
 1. Buildings that will receive noise levels of above 70 dB L_{AFmax} from the proposed landing pad, that do not currently receive noise levels of above 70 dB L_{AFmax} from the existing botanic gardens landing pad (this is an “adverse effect”)
 2. Buildings that will receive noise levels of above 70 dB L_{AFmax} regardless of which landing pad is used (this is a “neutral effect”)

¹ This level was measured directly in front of the aircraft and on the left-hand side of the aircraft. The same level was measured at both locations.

3. Buildings that will receive noise levels of below 70 dB L_{AFmax} from the proposed landing pad that would currently receive noise levels of above 70 dB L_{AFmax} from the existing landing pad (this is a “positive effect”).
- **Appendix C²:** This figure shows the L_{AFmax} noise levels that would be received from ground based operation at the proposed landing pad
 - **Appendix D:** This figure shows the L_{AFmax} noise levels that are currently received from ground based operation in the botanic gardens.

Our previous assessment discussed noise emissions in terms of sound exposure level (L_{AE}), day-night level (L_{dn}) and maximum noise level (L_{AFmax}). As there are likely to be few movements over the year, it is considered that sleep disturbance is the key noise effect that requires consideration and that this is best addressed using the L_{AFmax} noise level. It is understood that Timaru District Council generally agree with this approach. For further information on L_{dn} noise levels, refer to our previous report.

It is understood that the dwellings exposed to 70 dB L_{AFmax} (that are not currently exposed to such noise levels) will be notified as part of the resource consent application³. If any further information is required or Council consider that changes to the above assessment methodology are required, please do not hesitate to contact us.

Yours faithfully

MARSHALL DAY ACOUSTICS LTD



Peter Ibbotson

Consultant

² In Appendix C and D, the L_{AFmax} noise level during any aircraft movement have been shown. Note that 70 dB L_{AFmax} is the NZS6807:1994 L_{AFmax} night criterion for residential dwellings: there is no L_{AFmax} criterion for industrial or commercial building. The model results in Appendix C and D do not distinguish between industrial and commercial buildings and any notification arising from the modelled results should consider this.




³ Those shown as “peach coloured” in Appendix B.

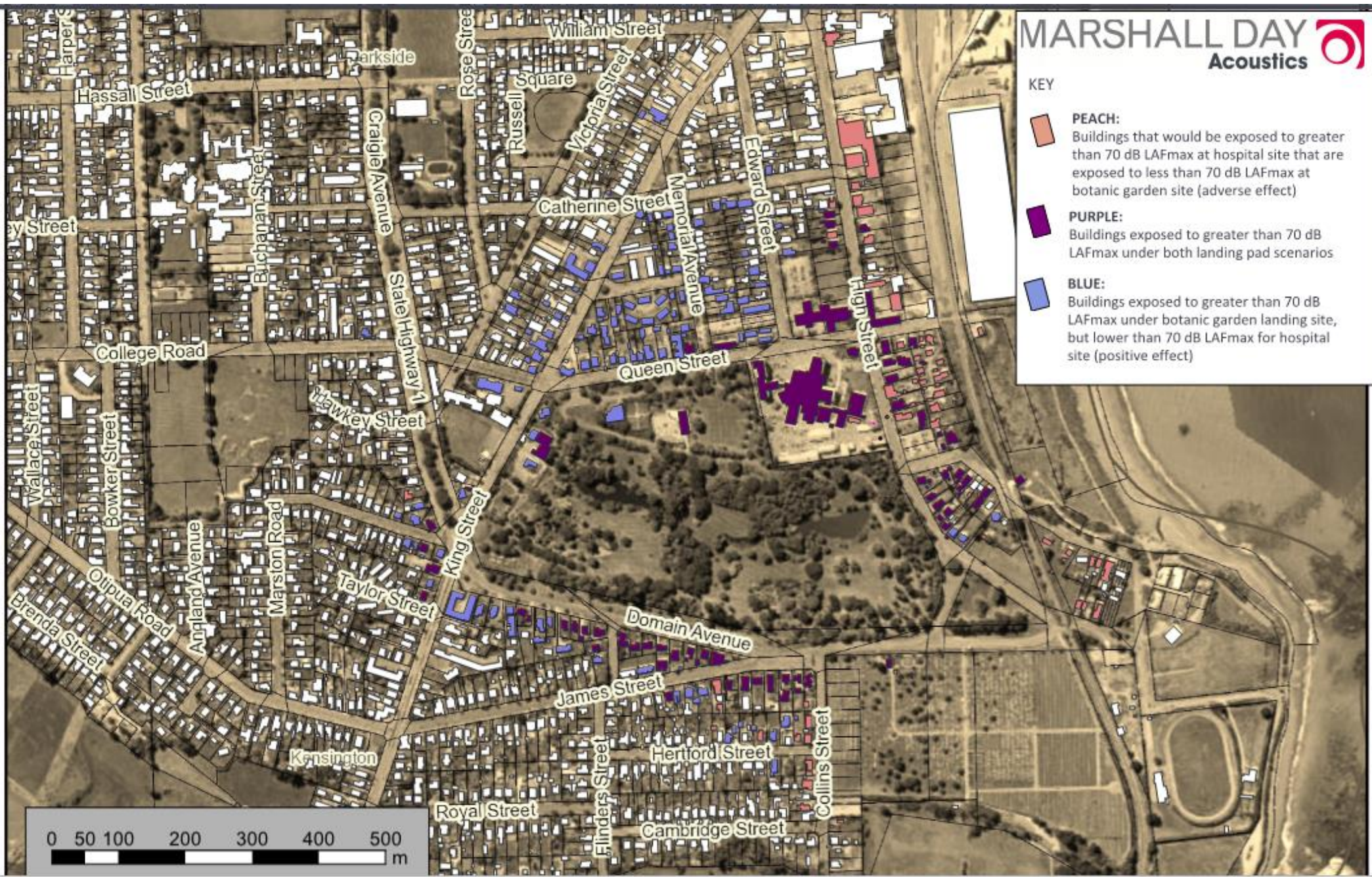
APPENDIX A REFERENCE SOUND POWER LEVEL

	Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1000	2000	4000	
BK117 L _w (for L _{zFmax})	139	132	132	138	133	132	124	138

APPENDIX B L_{AFMAX} OVERLAY FOR BOTH LANDING PADS (PROPOSED AND EXISTING)

KEY

-  **PEACH:**
Buildings that would be exposed to greater than 70 dB LAFmax at hospital site that are exposed to less than 70 dB LAFmax at botanic garden site (adverse effect)
-  **PURPLE:**
Buildings exposed to greater than 70 dB LAFmax under both landing pad scenarios
-  **BLUE:**
Buildings exposed to greater than 70 dB LAFmax under botanic garden landing site, but lower than 70 dB LAFmax for hospital site (positive effect)

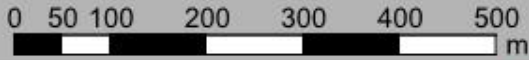


**APPENDIX C L_{AFMAX} NOISE LEVEL DURING GROUND BASED ACTIVITY AT PROPOSED SITE
(OVERLEAF)**



Noise level
 L_{AFMAX}
 BK117 arrival
 in dB(A)

■ < 70
■ \geq 70



PROJECT: TIMARU BASE HELICOPTERS - PROPOSED LANDING PAD		DRAWN: PETER IBBOTSON	
TITLE: LAFMAX NOISE LEVEL		SCALE: AS SHOWN	
		IMAGE: TDC GIS	

APPENDIX D L_{AFMAX} NOISE LEVEL DURING GROUND BASED ACTIVITY AT EXISTING BOTANIC GARDEN SITE (OVERLEAF)

