

RESOURCE CONSENT APPLICATION

APPLICANT: QUATTRO PROPERTY HOLDINGS LIMITED

CONSENT AUTHORITY: Waikato District Council

STATEMENT OF EVIDENCE OF ALEX ELI JACOB

Dated: 6th November 2020

Introduction

1. My full name is Alex Eli Jacob
2. I am currently employed as an Engineering Director at Earcon Acoustics Limited and have held this position since 2014

Qualifications and Experience

3. I hold a BSc in Mechanical Engineering, and I am a current member of the New Zealand professional engineers body, Engineering New Zealand (MEngNZ)
4. I have over 24 years of experience in the field of Engineering, including 7 years in New Zealand specialized in Acoustics. I have advised and prepared acoustic reports for over 100 various commercial activities and operations across New Zealand.

Code of Conduct

5. I have read the Environment Court's Code of Conduct for Expert Witnesses in the Environment Court of New Zealand and I agree to comply with it. My qualifications and experience as an expert are set out above. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.
6. The evidence that I give in these proceedings is within my area of expertise, except when I rely on the evidence of another witness or other evidence, in which case I have explained that reliance.
7. I declare that other than the professional acoustical consulting services I provide, as detailed in this Statement of Evidence, I have no interest, financial or otherwise, in the outcome of the proceeding.

Scope of Evidence

8. My evidence is limited to the noise and vibration effects from the proposed development in context of operation of the proposed facility at the subject site 561 Horotiu Rd in Te Kowhai (Site)
9. In my evidence I will discuss the following:
 - a) Waikato District Plan (WDP) standards applicable to the Site for operation of the proposed facility.

- b) Existing environment.
- c) Proposed development in context of noise propagation and shielding
- d) Operational noise – sources, effects and mitigation measures.
- e) Assessment of effects and compliance

Summary of Evidence

WDP Noise Standards

- 10. In accordance with the provisions of the Operative District Plan of the Waikato District, the subject site and surrounding sites are zoned Country Living.
- 11. In accordance with Clause 27.18 of the Operative District Plan, pertaining to Land Use Effects in the Country Living Zone, the following requirements apply to the Site:

Any activity is a permitted activity if it is designed and conducted so that noise from the activity measured at any other site does not exceed:

- a) 50dBA (L_{10}), 7am to 7pm Monday to Saturday, and
- b) 45dBA (L_{10}), 7pm to 10pm Monday to Saturday, and
- c) 40dBA (L_{10}), and 65dBA (L_{max}) at all other times and Public Holidays.

Despite the above, construction noise, farming noise, forest harvesting noise, extractive industry noise, and emergency sirens are not subject to these standards and are permitted under this rule.

- 12. The Operative District Plan defines Noise, as per the following quote, in context of the national standards NZS6801:1999, and NZS6802:1991. I make reference to these standards in context of assessment of noise and effects.

Noise: Means noise levels as measured in accordance with NZS6801:1999 Acoustics Measurement of Environmental Sound and assessed in accordance with NZS6802:1991 Assessment of Environmental Sound. Noise from vehicles being operated on a road shall not be controlled using rules in this plan, except where specifically provided for.

13. I note that the rules in the Proposed District Plan have no legal effect as at the preparation of this evidence, and as such, assessment is only made against the rules in the Operative Plan.

Existing Environment

14. The Site is adjacent the eastern side of Horotiu Road in a generally flat area, with large lots to the North, South and East, and across Horotiu Rd to the West.
15. Horotiu Road is noted to be a collector road with an AADT (Annual Average Daily Traffic) of approximately 4260 Vehicles Per Day with 4% Heavy Vehicles. I note here that approximately 75m north of the subject site is an intersection of Ngaruawahia Rd and Horotiu Rd.
16. We conducted ambient noise level measurements on the 6th of August 2019 during daytime hours of 12:30pm and 1:30pm. Based on these measurements the following ambient noise levels were noted in the vicinity.
 - a) At 10m from the edge of Horotiu Road near the North-South centre of the subject site: LA₁₀ 66dB, LA₉₀ 44dB
 - b) At 20m from the edge of Horotiu Road near the northern end of the subject site in-line with the dwelling of the northern neighbour at 557 Horotiu Rd: LA₁₀ 58dB, LA₉₀ 45dB.
 - c) At 50m from the edge of Horotiu Road at the eastern end of the subject site; LA₁₀ 55dB, LA₉₀ 43dB
17. Due to the Covid-19 alert levels, we were unable to conduct night time measurements, and as such, we created an environmental noise propagation model for traffic on Horotiu Rd, and collated the predicted levels with the measured daytime levels for verification purposes. Based on day, evening and night time distribution of traffic flow, night time noise levels are expected to be approximately LA₁₀ 42dB at the roadside and LA₁₀ 34dB at the eastern end of the site.
18. I note for reference here that the predictive models yielded daytime noise levels within 1dBA of the measure levels. This is consistent with the accuracy of the CoRTN standard used in the predictive model as noted in NZS6806:2010.

19. Sunday traffic, based on an AADT of 3200 Vehicles per day, yields ambient noise levels approximately 1dBA lower than weekday traffic noise. I note for reference here that doubling the number of cars on a road results in a 3dBA increase in noise levels.

Proposed development in context of noise propagation and shielding

20. The proposed facility comprises a single level building incorporating commercial activities including small scale retail shops, a hairdresser, a pizza takeaway shop, and a suprette. These have a range of operating hours covering 7am to 10pm daily.
21. The proposed building is aligned with the Northern and eastern boundaries of the site, with a parking area proposed centre of the site shielded from the northern and eastern neighbouring sites by the proposed building.
22. The proposed facility is expected to generate circa 1,000 - 1,400 vehicle movements per day.
23. The external walls of the proposed building are a combination of concrete and timber weatherboard.
24. In context of receivers, it is my understanding that the receiver at 571 Horotiu Rd has given written approval, and as such effects on this neighbour can be disregarded.
25. The other neighbouring sites are as follows:
 - a) 557 Horotiu Road to the North. This receiver is the closest to the proposed facility, and is currently occupied by a residential building in close proximity to the boundary.
 - b) Lot 4000 DP 527122 to the East. This receiver is a vacant site at the eastern boundary.
 - c) 8 Westvale Lane, 564A, 560A, B and C Horotiu Road to the West. These receivers are across Horotiu Road with residential dwellings set back from the boundary with the road.

Operational Noise Sources, effects and mitigation measures

26. The main sources of noise emanating from the development are as follows:

- a) Car Park Noises: Based on the CKL integrated transportation assessment, the development is conservatively expected to generate a maximum traffic flow of 186 Vehicles per hour at peak hour.
- b) Mechanical Plant Noise: Main mechanical plant is proposed to be located centrally on the roof. Additionally external heat pumps, extractor fans and chillers may be required at the eastern side of the building. I note that noise from mechanical plant is controlled by design, as it can be selected, shielded and located to produce noise levels within required limits.
- c) People and Takeaway noises: The noise associated with people and the outdoor seated area of the takeaway are assumed to produce conversational noise levels similar to a small café.
- d) Refuse Collection (Vehicles): Rubbish collection, particularly the pickup of recycling, is required to occur between 7am and 7pm. The rubbish and recycling collection will occur in designated area in the south-eastern portion of the site.

27. I note the following mitigation measures and best practicable options incorporated into the proposed design of the facility:

- a) The design of the building incorporates an orientation where noise is facing away from the noise sensitive adjacent northern and eastern neighbours.
- b) Parking and traffic movements have been located on the south-western portion of the site, as far as practicably possible from neighbouring residential receivers.
- c) The façade facing the adjacent eastern neighbour is solid with no glazing or penetrations to attenuate any internal noise levels.
- d) Glazed doors on the façade facing the adjacent northern neighbour are required to be acoustically suitable with an STC rating of 31 to attenuate any equipment noise required to operate continuously.
- e) Occupied operation of the facility requiring external noise sources is limited to the daytime and evening periods, with no activities occurring after 10pm.
- f) The mechanical plant units for each tenancy shall be selected to be well within compliance with the District Plan noise limits at all times.
- g) Truck deliveries/pickups are restricted to daytime hours.

h) Acoustic screening is proposed to reduce any potential noise from the takeaway facility.

28. Based on an environmental noise propagation model constructed for the proposed facility, the following noise levels, based for traffic on peak hour, are predicted at the closest receivers. This includes the individual sources, and sources in combination, for both daytime and night time operations:

Location	Predicted noise level - Day (LA₁₀ dB)			
	<i>Vehicles</i>	<i>Plant</i>	<i>People</i>	<i>Cumulative</i>
557 Horotiu Rd	34	42	42	45
Lot 4000 DP 527122	<25	40	24	40
560C Horotiu Rd	36	32	34	38
560A Horotiu Rd	41	34	40	44
564A Horotiu Rd	42	34	39	44
8 Westvale Lane	43	31	31	43

Table 1 - Daytime Noise Levels

Location	Predicted noise level – Night (LA₁₀ dB)
557 Horotiu Rd	33
Lot 4000 DP 527122	33
560C Horotiu Rd	<30
560A Horotiu Rd	<30
564A Horotiu Rd	<30
8 Westvale Lane	<30

Table 2 - Night time noise levels

Assessment of Effects and Compliance

29. The following applicable limits, measured at any point in a receiver site, are in accordance with the provisions of the Operative Version of the Waikato District Plan:
 - a) 50dBA (L_{10}), 7am to 7pm Monday to Saturday, and
 - b) 45dBA (L_{10}), 7pm to 10pm Monday to Saturday, and
 - c) 40dBA (L_{10}), and 65dBA (L_{max}) at all other times and Public Holidays.

30. With regards to the existing ambient environment, noise levels at the receiver sites from traffic along Horotiu Road are as follows:
 - a) Current daytime noise levels range from LA_{10} 66dB at the roadside to LA_{10} 55dB at circa 50m from the road.
 - b) Sunday daytime levels would be within 2dBA lower than the above noise levels with reduced traffic movements.
 - c) Current night time noise levels range from LA_{10} 42dB at the roadside down to LA_{10} 34dB.

31. I note here that daytime noise levels in the existing environment from traffic are already above the Operative District Plan limits due to the proximity of receivers to Horotiu Rd.

32. In context of noise character, traffic noise generated from the proposed facility would be well below the existing traffic noise, and as such would not acoustically change or affect the current environment.

33. Notwithstanding practicability, if the development is viewed in isolation of the existing environment with traffic noise from Horotiu Rd, the following applies to noise from operation of the proposed facility, conservatively based on peak hour traffic:
 - a) Monday-Saturday Daytime: Noise levels compliant at all receivers.
 - b) Monday-Sunday Night time: Noise levels compliant at all receivers.
 - c) Sunday Daytime: Noise levels exceeding the limits by up to 5dBA at northern and western receivers.

34. In context of the specific receivers for Sunday daytime:
- a) For the receivers to the West across Horotiu Rd, the main noise emission from the site would be traffic, which would not be differentiable from traffic noise along Horotiu Rd.
 - b) At 557 Horotiu Rd to the North, the main source of noise from the site would be from mechanical plant and people noise. As these would be well below ambient traffic noise, they would be masked and would not alter the existing environment.
35. With regards to Sunday daytime noise level compliance:
- a) I note that the exceedance (in strict terms of compliance in isolation from the existing noise environment) would neither be practicably measurable nor audibly discernible. The environment is already well above the introduced noise and the character of current environmental noise would dominate and mask the introduced noises.
 - b) If, however, Sunday noise level compliance is strictly required from the facility independent of the existing environment, this can readily be achieved by establishment of an acoustic fence along the length of the Site boundary with 557 Horotiu Rd, and along the boundary of the proposed carpark with Horotiu Road. Fence would need to have a minimum surface density of 10kg/m^2 , with no gaps, and with a minimum 1.8m in height.

Effects

36. In context of effects, the introduced noise levels from operation of the proposed facility would be below the existing noise levels in the surrounding environment, and as such, provided the mitigation measures are implemented including appropriate selection and shielding of mechanical plant, the proposed facility would not change the noise characteristics of the surrounding environment.

Dated: 6 November 2020

Alex Jacob