

THREE KINGS QUARRY
Noise Compliance Assessment – Quarry Activity
Rp 004 2011528A

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Project: **THREE KINGS QUARRY**
Noise Compliance Assessment – Quarry Activity

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1.0 INTRODUCTION

Marshall Day Acoustics (MDA) has carried out an environmental noise survey at monitoring positions adjacent to Three Kings Quarry, Mt Eden on 5 July 2013. Winstone Aggregates is required to undertake two noise surveys per year, at two identified monitoring positions, as part of the Environmental Management Plan for the quarry, in order to determine compliance with the noise rules for the site.

“Fill” operations are also taking place at the northern end of the quarry. Sound generated from these activities must comply with the conditions in Environment Court Decision No. [2011] NZEnvC 214.

2.0 NOISE PERFORMANCE STANDARDS

The quarry is zoned *Business 7* in the City of Auckland District Plan Isthmus Section – Operative 1999. The closest dwellings are located immediately to the west of the quarry in Fyvie Avenue. The noise rule for operations within the quarry is:

“Noise Control at the Residential Interface

The L_{10} noise level and maximum level (L_{max}) arising from any activity measured at or within the boundary of any residential zoned property shall not exceed the following limits:

<i>Monday to Saturday</i>	<i>7.00 am – 10.00 pm</i>	<i>L_{10} 55 dBA</i>
<i>Sunday and Public Holidays</i>	<i>9.00 am – 6.00 pm</i>	
<i>At all other times</i>		<i>L_{10} 45 dBA</i>
		<i>L_{max} 75 dBA, or background (L_{95}), plus 30 dBA whichever is the lower</i>

The above noise levels shall be measured and assessed in accordance with the requirements of the NZS 6801:1991 “Measurement of Sound” and NZS 6802:1991 “Assessment of Environmental Sound” or their replacement.”

3.0 MEASUREMENTS

3.1 General

Measurements were completed at the Fyvie Avenue measurement position on 5 July 2013 between 11:00 am and 11:30 am. Measurements could not be practicably undertaken at the Grahame Breed Drive position due to noise from construction activities associated with the building of a new 3-storey apartment development at 12-18 Henshaw Avenue, Mt Roskill.

The measurement positions are the same as in all previous compliance measurements of this type and are shown on the figure in Appendix A.

Sound level measurements were carried out using a Brüel & Kjaer 2250 sound level meter, which satisfies the requirements for a Type 1 sound level meter according to IEC 651.

Measurements were carried out and assessed generally in accordance with the relevant New Zealand Standards.

The weather was fine with 7 oktas cloud cover and a light breeze from the south-west.

3.2 Operations and Equipment

The following equipment was operating in the quarry during the survey. These operations were confirmed by the quarry supervisor following completion of the survey.

Quarry Activity (including scoria extraction):

- 1 x Terex Pegson 4242SR Mobile Crusher (operating at the south-eastern corner of the quarry)
- 1 x Komatsu WA480-6 wheel loader, moving crushed aggregate from the mobile crusher to the stockpile areas and loading aggregate trucks
- 1 x Hyundai 210 Excavator loading scoria into the mobile crusher
- 1 x CAT 350 Excavator, loading scoria into a dump truck at the south-western corner of the quarry
- 1 x Volvo A35 Dump Truck, moving scoria from the south-western corner to the south-eastern corner of the quarry to be crushed
- Arrival and departure of trucks collecting aggregate from the stockpiles

Fill Operations Activity (at northern end of quarry):

- 1 x Hyundai 290 Excavator digging out from the trench and stockpiling
- 1 x CAT D6 Swamp Track Bulldozer spreading and compacting fill
- Arrival and departure of trucks delivering fill materials

3.3 Results

The measured sound levels are presented in Table 1 below.

Table 1 – Measured Sound Levels

Measurement Position	Duration	dB L _{A10}	Noise Sources ⁽¹⁾
Fyvie Avenue	20 minutes	51	CAT 350 excavator and A35 dump truck (south-western corner of quarry), <u>D6 bulldozer pushing out fill</u> , <u>Hyundai 290 excavator</u> , trucks collecting quarry materials and delivering fill, general loader operations <i>Occasional:</i> Bird sounds, truck air brake sounds, distant sound of children's voices from Three Kings School

Notes to Table 1:

- (1) Dominant sound source(s) underlined
- (2) Noise from mobile crusher and attendant excavator not noticeable from measurement position

3.4 Discussion

3.4.1 Fyvie Avenue

Sound from quarry and fill operations was audible at the Fyvie Avenue measurement position.

Engine sounds from the CAT D6 Swamp Track bulldozer pushing out fill (Refer Photo 1) was clearly audible above other quarry sounds.

The Terex Pegson crushing plant was located at the south-eastern corner of the quarry (Refer Photo 2) and was screened by quarry topography in regard to sound received at this measurement position.

Ambient sound sources (i.e. not associated with the quarry activity) included bird sounds and distant children's voices.

Activity from both quarry operations (including scoria extraction) and fill operations took place during the measurement.

The measured sound level of 51 dB L_{A10} readily complies with the relevant noise criterion of 55 dB L_{A10} .

3.4.2 Grahame Breed Drive

As previously noted it was impracticable to measure noise emission from the quarry due to on-going intrusive noise from construction of a new building development at 12-18 Henshaw Avenue, Mt Roskill by NZ Strong Construction.

During the site visit, sounds from quarry activities were audible intermittently, but only when construction was quiet.

The noise effects from the construction site dominated the noise environment in the vicinity of the measurement position. Subsequently, it is considered that any potential noise effects from the quarry would be of no concern at this location whilst the construction activity continues to dominate the noise environment.

As advised by NZ Strong Construction, all external works at 12-18 Henshaw Avenue are expected to be completed by the end of November 2013, with only quieter internal works remaining to be completed thereafter.

Based on the above, it is recommended that measurement of quarry noise levels at the Grahame Breed Drive position should be undertaken at the next 6 monthly noise survey, by which time the adjacent construction activity will have ceased.



Photo 1 – North End of Quarry



Photo 2 – South-east Corner of Quarry



Photo 3 – South-west Corner of Quarry



Photo 4 – View from Southern End

4.0 CONCLUSIONS

Marshall Day Acoustics has completed noise monitoring at one of the two nominated monitoring positions as required by the Environmental Management Plan for the Three Kings Quarry. The second position, at Grahame Breed Drive, could not be practicably measured due to intrusive noise from a nearby construction site.

Sound generating activity from the quarry during the monitoring included general quarry activity, scoria extraction and fill operations.

Fill operations were taking place at the northern end of the quarry involving one bulldozer to spread and compact the fill material, an excavator and trucks delivering material to the fill area.

Quarry operations included scoria extraction at the south-west corner of the quarry, crushing at the south-east corner and the loading and stockpiling of crushed product.

The sound levels measured at the Fyvie Avenue measurement position complied with the relevant noise limit for quarry operations on the site.

The noise environment at the Grahame Breed Drive measurement position is currently controlled by noise from construction activity at 12-18 Henshaw Avenue, Mt Roskill. Accordingly, it is recommended that quarry noise levels are measured at this location in six months time when the construction activity is expected to have ceased.

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