



MARSHALL DAY
Acoustics 

THREE KINGS QUARRY
SOAKAGE INFRASTRUCTURE ASCNMP
Rp 001 2016459A | 18 August 2016

Project: **THREE KINGS QUARRY**

Prepared for: **Winstone Aggregates
PO Box 17195
Greenlane
Auckland 1546**

Attention: **Andrea Cave**

Report No.: **Rp 001 2016459A**

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1.0 INTRODUCTION

This Activity Specific Construction Noise Management Plan ("ASCNMP") relates to consented construction works located at Three Kings Quarry, 985 Mt Eden Road, Three Kings, Auckland.

Project	Three Kings Development – South-western Soakhole
Location	Three Kings Quarry
Project Manager	Andrea Cave
Total Construction Duration	3 years
ASCNMP Construction Period	July 2016 to May 2017
Construction Times	Monday to Saturday, 0700 to 1800hrs

This ASCNMP is required to satisfy consent number NZ Env 214. It identifies the performance standards that must, where practicable, be complied with. It also sets out best practicable options to avoid, remedy or mitigate adverse noise effects from the project.

This ASCNMP shall be implemented throughout the entire construction period. It should be considered a 'living document' which shall undergo expansions and updates as appropriate.

The ASCNMP is a stand-alone document, and is intended to be the primary tool to inform the project's management of construction noise effects.

A glossary of acoustic terminology can be found in Appendix A.

2.0 CONTACT DETAILS

Table 1: Contacts

Role	Name	Organisation	Phone	Email
Client	Andrea Cave	Winstones Aggregates	(09) 525 9027	Andrea.Cave@gbcwinstone.co.nz
Site Adviser	Angela Klein	Winstones Aggregates	027 504 3624	Angela.Klein@gbcwinstone.co.nz
Winstones acoustics advisor	Mat Cottle	Marshall Day Acoustics	(09) 379 7822	mat.cottle@marshallday.co.nz
Council – Noise/ Environmental Health	TBA	Auckland Council	TBA	TBA@auaucklandcouncil.govt.nz
Public complaint contact number	Angela Klein	Winstones Aggregates	027 504 3624	Angela.Klein@gbcwinstone.co.nz

Angela Klein will be responsible for ensuring that this ASCNMP is correctly implemented. She will review all documentation relating to construction noise before it is issued.

All site personnel will be required to read and sign the construction noise induction form (refer to Appendix E) and any relevant schedules. If required, specific training will be provided for site personnel.

3.0 PROJECT OVERVIEW

Works relating to this ASCNMP form a part of the overall redevelopment of the site by Fletcher Residential into a residential precinct including apartments, town houses and open space areas including sports fields. This work consists of the receipt of rock and concrete at the south-western corner of the site. The material is being used to construct a soakage hole (soakhole), enabling subsurface storage of stormwater flows.

Handling, sorting and stockpiling of incoming material and excavated rock from the quarry is required to improve it to meet soakage specification. While much of the soakhole has already been completed, extra material is required to be stockpiled in order to ensure there is sufficient quantity for future use on other soakage devices required for the development.

3.1 Site Location

A site plan is included in Appendix B which depicts the site, the area of works relevant to this ASCNMP, and adjacent residential receivers.

3.2 Hours of Construction

In general, construction activities shall be undertaken between 0730 and 1800hrs, Monday to Saturday. No construction shall occur on Sunday and public holidays.

3.3 Construction Methodology

Materials will be delivered to site via twin-axle truck (with or without articulated trailer) and deposited in the allocated area. Several excavators and a bulldozer may be used to sort and place the material in the soakhole, other soakage features beside the soakhole, or stockpiled for future use.

Material will also be carted away from the stockpile to other soakage zones within the site using road trucks or dump trucks.

At some stage, rock may be excavated from the site using excavators and hauled to soakholes or stockpiled, using dump trucks.

3.4 Construction Programme

The construction programme is currently being developed and will be appended to this ASCNMP when it becomes available.

4.0 NOISE PERFORMANCE STANDARDS

4.1 Construction Noise Condition of Consent

Condition 43 from consent number NZ Env 214 is reproduced in part below.

Construction Noise Management Plan

- 46-43. If the consent holder intends to rely on the construction noise limits set out in the District Plan for any construction works on the site, the consent holder shall, prior to the commencement of any such construction, submit a Construction Noise Management Plan (CNMP) consistent with the NZS standard 6803:1999 Acoustics - Construction Noise prepared by a person suitably qualified in environmental



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4.2 Construction Noise Limits

The construction works are subject to, and shall as far as practicable comply with the limits provided in Table 2 from New Zealand Standard NZS 6803: 1999 “Acoustics - Construction Noise”. These limits are included below.

Table 2 – Recommended upper limits for construction noise received in residential zones and dwellings in rural areas

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

The duration of soakage infrastructure works in the south-western area of the site is 10 months, within total site construction duration of 8-10 years. This is classified as ‘long term’ duration works in accordance with NZS6803: 1999¹. Therefore, the long term noise criteria (outlined in red in Table 2 above) apply to soakage infrastructure works.

The assessment position is at a distance of 1 metre from the façade most exposed to project construction activities, and 1.2 to 1.5 metres above the relevant floor level. No correction shall be made for façade reflection².

In summary, the relevant noise limits for construction occurring during normal working hours (0730 to 1800hrs) is 70dB L_{Aeq} and 85dB L_{Amax} .

¹ NZS 6803: 1999 Clause 7.2.1

² NZS 6803: 1999 Sections 5.2 and 6.2.1

5.0 CONSTRUCTION EQUIPMENT AND NOISE LEVELS

The following table lists all significant equipment proposed to be used on the project. The sound level for each item of equipment is based on measurements made by MDA of similar plant used on other projects or from BS 5228-1:2009 *Code of practice for noise and vibration control on construction and open sites* Part 1: Noise.

During initial site noise monitoring the validity of this data shall be confirmed and the table updated where necessary for the major items of equipment.

Table 3: Activity Specific Noise Levels

Item/Activity	Typical Operating Sound Power Level (dB L _{WA10})	BS5228 Reference	Noise Level (dB L _{A10})			
			@ 10m	@ 50m	@ 100m	@ 200m
1 50t excavator (placing rock)	114	C.1.13	86	72	66	60
2 30t excavator (separating rock)	111	C.1.12	83	69	63	57
3 Articulated truck movement	107	MDA	79	65	59	53
4 Bulldozer (40T)	113	MDA	85	71	65	59
Activity Noise Level	118		90	76	70	64

6.0 AFFECTED DWELLINGS

Dwellings that have line of sight to the project are located on the following roads:

- Mt Eden Road
- Fyvie Avenue
- Henshaw Avenue
- Barrister Avenue
- Smallfield Avenue

Dwellings potentially affected by construction noise effects are indicated on the figure in Appendix B.

7.0 MANAGEMENT AND MITIGATION MEASURES

7.1 Consultation

Consultation with potentially affected stakeholders shall be carried out prior to commencement of construction activities as follows:

- **Receivers within 100 metres of the construction area:** Written notification and a Project description shall be provided to raise awareness of the Project, its expected activities and duration
- **Receivers within 50 metres of the construction area:** Individual written notification shall be provided and opportunity made available for discussions on a case-by-case basis, if requested by the occupants/owners. If required and necessary, suitable alternatives and/or mitigation options shall be explored that are acceptable to both parties. Ongoing consultation shall be carried out throughout the duration of construction

7.2 General Mitigation Measures

The following shall be implemented throughout the construction program:

- Quiet equipment/models shall be used in favour of noisy equipment, where practicable
- Where it is practicable to do so, smaller plant and machinery shall be used when operating in close proximity to site boundaries
- Construction equipment shall be well maintained in order to reduce noise resulting from the deterioration of equipment
- It is the responsibility of Winstones to maintain a tight timeframe and keep the construction time near noise sensitive areas to a minimum
- Toolbox training sessions to inform contractors of the noise sensitivities
- Avoid unnecessary noise such as shouting, the use of horns, banging or shaking of excavator buckets and tonal reverse beepers
- Utilise noise bunding / barriers where appropriate and practicable

Where utilised, noise bunding / barriers should be:

- Positioned to block line of sight between the activity and receiving position
- Positioned as close as practicable to noisy construction work

8.0 NOISE MONITORING

8.1 General

Construction noise monitoring shall be undertaken as follows:

- At the onset of works that are predicted to exceed the relevant noise limits
- When a reasonable noise complaint is received

The following information shall be recorded:

- The time, date and personnel undertaking the measurements
- The activity and location of works during the measurement period
- The measured noise or vibration level
- Monitoring records shall be kept at the site office and made available to Auckland Council upon request

In the event of a non-complying activity being identified, a suitably qualified acoustic consultant shall be engaged and the following formal process shall be implemented:

- Construction noise levels shall be monitored and assessed
 - In accordance with the relevant acoustic standard
 - At locations representative of sensitive receivers in the vicinity
 - To reflect representative construction activities, and shall be no less than 10 to 15 minutes and not exceed 60 minutes duration
- The results shall be summarised in a report and submitted to Council within one week of receiving the complaint

8.2 Contingency Measures

In the event that a measurement shows non-compliance with the relevant acoustic standard, the following procedures shall be implemented:

- Further measurements shall be undertaken where necessary, to determine the extent of non-compliance
- A report shall be prepared, outlining the non-compliance and, if required, potential mitigation and management measures
- Upon implementation of any additional mitigation measures, further measurements shall be undertaken to confirm the effectiveness of those mitigation measures

The ASCNMP manager (Angela Klein) shall liaise with affected receivers throughout this process.

Refer to Appendix D for a detailed response plan for construction noise issues.

9.0 COMPLAINTS PROCEDURE

A contact name and phone number to which complaints can be directed shall be clearly included in written correspondence and on-site signage.

An initial response shall be undertaken as soon as practicable, however this should be within 1 hour of receiving a complaint, and resolved as soon practicable thereafter.

Any construction noise complaint shall be recorded in a complaints file, and an investigation shall be undertaken involving the following:

- Identification of the source(s) of concern, and measuring or estimating noise levels at the time of the complaint
- Reporting of findings and recommendations
- Actions and time taken to close-out complaint
- Communication with the complainant
- Reporting of the investigation in the complaints file

APPENDIX A GLOSSARY OF TERMINOLOGY

dB	<u>Decibel</u> : The unit of sound level. Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
$L_{\text{Aeq}}(t)$	<p>The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.</p> <p>The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.</p>
L_{Amax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 <i>"Acoustics - Construction Noise"</i>

APPENDIX B SITE OVERVIEW AND RECEIVING ENVIRONMENT



Source: Google Earth Pro

APPENDIX C CONSTRUCTION NOISE CONDITIONS SET

Construction Noise Management Plan

- 46.43. If the consent holder intends to rely on the construction noise limits set out in the District Plan for any construction works on the site, the consent holder shall, prior to the commencement of any such construction, submit a Construction Noise Management Plan (CNMP) consistent with the NZS standard 6803:1999 Acoustics - Construction Noise prepared by a person suitably qualified in environmental



2275791 Discharge consent - Environment Court

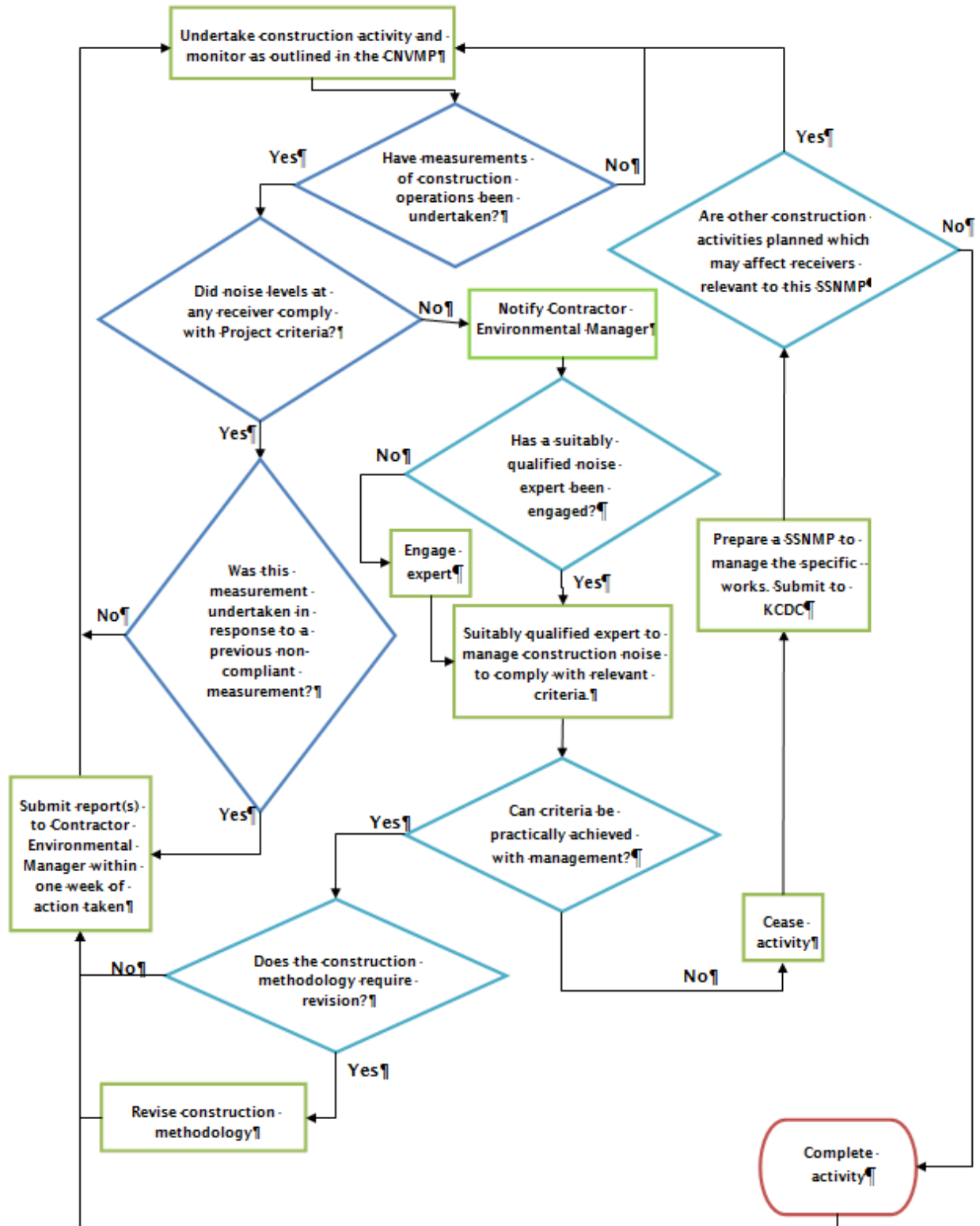
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acoustics to the satisfaction of the Manager. The CNMP shall include but not be limited to: [Replaces Land Use Condition 19]

- (a) A description of the final construction methodology, including a list of potentially noisy plant and equipment, the estimated noise levels and the approximate locations within the site;
- (b) Predicted noise levels and where the predicted noise levels exceed the construction noise standard NZS 6803:1999, specific noise mitigation measures must be implemented which may include but not be limited to acoustic screening, alternative equipment etc;
- (c) Noise monitoring must be undertaken at the onset of works that are likely to exceed the relevant noise limits. Additional monitoring will be required to be undertaken in the event of any complaints received;
- (d) In the event of the measured noise levels exceeding the relevant standard, the Manager must be notified without delay and further mitigation options shall be investigated and implemented;
- (e) A complaints management system must be implemented. It must specify the responsible persons for maintaining the complaints register, procedures to be followed in investigating and resolving complaints and procedures for reporting complaints to council; and
- (f) The name and contact telephone numbers of the Site Manager or other persons responsible for supervision of the works, implementation of the Noise Management Plan and complaint receipts and investigations.

APPENDIX D NOISE RESPONSE PLAN FLOW CHART



APPENDIX E CONSTRUCTION NOISE INDUCTION FORM

Project: Soakhole Infrastructure Works in South-western corner

There are many residential and some commercial neighbours adjacent to the site, where construction noise criteria apply. To ensure criteria are achieved, all staff are responsible for good noise management.

The following shall be implemented throughout the construction programme:

- 1 When arriving at work prior to 0730hrs, please drive slowly on site and keep revs to a minimum.
- 2 No shouting or swearing on site. Either walk over and talk to somebody or use a radio/phone.
- 3 Be careful with lifting heavy loads. Place them down and do not drop them.
- 4 Do not drag materials on the ground. Place them down when you arrive at the work area.
- 5 Equipment and vehicles should not be left running when not in use.
- 6 When loading trucks try not to drop material from a height. Load softer material at the bottom.
- 7 Noise enclosures should always have all doors/hatches closed when the equipment is in use.
- 8 Stationary equipment such as pumps and generators should be located away from neighbours.
- 9 All equipment is to be well maintained.
- 10 No work that could cause noise disturbance shall be conducted outside the hours of 0730h to 1800h Monday to Saturday (and no work at all shall be conducted outside the hours of 0630h to 2000h) unless an activity specific assessment has been carried out.
- 11 If you see anything/anyone making unnecessary noise then stop it/them. If the source cannot be stopped then report it to Angela Klein.
- 12 It is essential that good relationships are maintained with the local community. Any queries from members of the public should be responded to politely and referred to Angela Klein. Staff shall assist the public to make contact with this person. Staff shall not enter into debate or argue with members of the public.
- 13 No work that could cause noise disturbance is to be conducted until all staff involved in the task have read and signed the Construction Noise Management Schedule for that task.

Table E1: Induction List

[illegible]