8.3 AMENITY MATTERS

8.3.1 NOISE

8.3.1.1 DISCUSSION, PURPOSE AND REASONS

(1) Noise pollution now forms a major source of intrusion into the environment. As the demand for urban development continues and we have less space to call our own, it is likely that noise pollution will continue to be a matter requiring management.

(2) The Resource Management Act 1991 has recognised the important role that the control of noise has in terms of giving effect to the purpose of the Act, particularly as it relates to protecting amenity values. Section 31(1)(d) of the Act gives Council the function of controlling the emission of noise and the mitigation of the effects of noise. This function is supported by other provisions in the Act relating to the general duty to avoid unreasonable noise, enforcement penalties and other actions available to Council.

(3) Reaction to noise varies considerably, not only between individuals but also between communities. The standards set out in this section reflect the need for some flexibility while providing a standard which developers can design to and which the community can be confident will provide a recognised element of protection. The basis for these controls comes from social and acoustical research undertaken locally, nationally and internationally.

(4) Due to their national, regional and district importance, the efficient functioning of existing regionally significant road and potential rail networks through the District needs to be protected from noise sensitive activities establishing in close proximity to them and potentially restricting their operation due to reverse sensitivity effects. Where regionally significant transport routes already have noise sensitive activities established alongside them, there is limited ability through the District Plan to address that issue. However, the opportunity to avoid reverse sensitivity effects can be taken where new noise sensitive activities seek to establish. This is addressed through the relevant zone development standards.

(5) In the Industrial Zone, it is recognised that noise levels are likely to be higher as a result of the type of activities permitted in the zone. There is other legislation that protects workers within the zone and hence there are no District Plan standards within the zone.

(6) The noise requirements in this standard do not over-ride the "excessive noise" provisions in Sections 326 - 328 of the Resource Management Act 1991.

8.3.1.2 ENVIRONMENTAL RESULTS

(1) To protect the character and amenity values of areas (particularly residential and reserve) and public health from the effects of excessive environmental noise.

(2) To allow some noise sources generated as an ancillary part of normal permitted activities in a zone (eg lawn mowing, wood cutting (for domestic use on site) in a residential area) to be exempt from these performance standards.

(3) To recognise the community expectation that maximum noise levels will continue to decline as developments in the design of machinery, buildings and acoustic materials enable the effects of noise to be reduced.

8.3.1.3 STANDARDS

(1) LEVELS

Noise shall not exceed the levels set out below when measured in accordance with the provisions of New Zealand Standard (NZS) 6801:2008 Acoustics – Measurement of Environmental Sound and assessed in accordance with the provisions of NZS 6802:2008 Acoustics – Environmental Noise:

(a) Between *Sites* Within *Zones*

Zone	Standard	$L_{Aeq(15\ min)}$	L_{AFmax}
▪ Residential ▪ Low Density Residential ▪ Rural ▪ Coastal ▪ Karangahake Gorge	All activities in each of the Residential and Low Density Residential Zones shall be conducted to ensure that the following noise levels shall not be exceeded within any other site contained within that *zone*.		
	All activities in the Rural, Coastal and Karangahake Gorge Zones shall be conducted to ensure that the following noise levels shall not be exceeded within the *notional boundary* of any *residential property* within that *zone*.		
	On all days 7.00am - 10.00pm	50*dB*	NA
	On all nights 10.00pm – 7.00am	40*dB*	65*dB*
▪ Town Centre ▪ Township ▪ Marae Development	All activities in these *zones* shall be conducted to ensure that the following noise levels shall not be exceeded within any other site contained within that *zone*.		
	On all days 7.00am - 10.00pm	55*dB*	NA
	On all nights 10.00pm - 7.00am	40*dB*	65*dB*
▪ Industrial & Reserve (Active)	On all days, at all times.	No restrictions	
▪ Reserve (Passive) ▪ Conservation	All activities in each of these *zones* shall be conducted to ensure that the following noise levels shall not be		

Zone	Standard	$L_{Aeq(15\ min)}$	L_{AFmax}
(Wetland) ▪ Paeroa Flood Ponding	exceeded within any other site contained within that *zone*		
	On all days, at all times	55*dB*	NA
▪ Conservation (Indigenous Forest)	All activities within this *zone* shall be conducted to ensure that noise from the *site* shall not exceed the following noise levels measured within the *notional boundary* of: Any *building* used for residential activities (eg dwellings, huts, lodges); or camping facilities used by the public (where this is in a defined location specifically identified as a camping area).		
	On all days 7.00am – 10.00pm	50*dB*	NA
	On all nights 10.00pm – 7.00am	40*dB*	65*dB*

(b) Between *Zones*

Zone	Standard	$L_{Aeq\ (15\ mins)}$	L_{AFmax}
▪ Township ▪ Marae Development ▪ Reserve (Passive) ▪ Conservation (Indigenous Forest)	All activities on any *site* within these *zones* shall be conducted to ensure that noise from the *site* as measured within the *zone* boundary of a Residential, Low Density Residential and Marae Development Zone or within the *notional boundary* within the Rural, Coastal, or Karangahake Gorge Zone, shall not exceed the following noise levels:		
	On all days 7.00am - 10.00pm	50*dB*	NA
	On all nights 10.00pm - 7.00am	40*dB*	65*dB*
▪ Reserve (Active)	All activities on any individual reserve shall be conducted to ensure that noise from the reserve as measured within: i) the *zone* boundary of a Residential and Low Density Residential Zone; ii) the *notional boundary* within the		

Zone	**Standard**	L_{Aeq} (15 mins)	L_{AFmax}
	Rural, Coastal, and Karangahake Gorge Zone; iii) the *notional boundary* of: any *building* used for residential activities (eg dwellings, huts, lodges); or camping facilities used by the public (where this is in a defined location specifically identified as a camping area) in the Conservation (Indigenous Forest) Zone, shall not exceed the following noise levels:		
	Sunday to Thursday: 7.00am - 10.30pm	50*dB*	NA
	Friday & Saturday: 7.00am - 12.00pm (midnight)	50*dB*	NA
	At all other times	45*dB*	65*dB*
▪ Industrial ▪ Town Centre	All activities on any *site* within these *zones* shall be conducted to ensure that noise from the *site* as measured within the *zone* boundary of a Residential, Low Density Residential and Marae Development Zone or within the *notional boundary* within the Rural, Coastal, or Karangahake Zone, shall not exceed the following noise levels:		
	Monday – Saturday 7.00am - 10.00pm	50*dB*	NA
	Sunday and Public Holidays 7.00am - 10.00pm	45*dB*	NA
	On all nights 10.00pm – 7.00am	40*dB*	65*dB*
▪ Industrial	All activities on any *site* within this *zone* shall be conducted to ensure that noise from the *site* as measured within the *zone* boundary of a Reserve (Active) or Town Centre Zone, shall not exceed the following noise levels:		
	On all days. 7.00am - 10.00pm	55*dB*	NA

Zone	Standard	L_{Aeq} (15 mins)	L_{AFmax}
	All activities on any *site* within this *zone* shall be conducted to ensure that noise from the *site* as measured within the *notional boundary* within a Reserve (Active) or Town Centre Zone shall not exceed the following noise levels:		
	On all nights 10.00pm - 7.00am	45*dB*	65*dB*
▪ Industrial	All activities on any *site* within this *zone* shall be conducted to ensure that noise from the *site* as measured within the *zone* boundary of the Reserve (Passive) Zone shall not exceed the following noise levels:		
	On all days, at all times	55*dB*	NA

(c) *Temporary Military Training* Activities

Zone	Standard	L_{Aeq} (15 mins)	L_{A95}	L_{AFmax}
▪ In all *zones*	Noise, measured at the *notional boundary* of any *residential property* shall not exceed the following limits:			
	Any Day 12.00 (midnight) - 6.30 am 6.30am - 7.30 am 7.30am - 6.00 pm 6.00 pm – 10.00 pm 10.00 pm – 12.00 (midnight)	 40*dB* 60*dB* 75*dB* 70*dB* 40*dB*	 N/A 45*dB* 60*dB* 55*dB* N/A	 65*dB* 70*dB* 90*dB* 85*dB* 65*dB*
	Noise, measured at the *notional boundary* of any *residential property*, resulting from the use of explosives shall not exceed 122 L_{Cpeak} during daylight hours. The use of explosives is not provided for during night-time hours.			

(d) Exemptions

(i) In all *zones*, Rule 8.3.1.3(1) shall not apply with respect to normal domestic activities and *accessory uses* thereto (eg lawn mowing, chainsawing undertaken at reasonable times and in domestic circumstances).

(ii) In the Rural, Coastal and Karangahake Gorge Zones, Rule 8.3.1.3(1) shall not apply to normal rural activities that follow accepted rural management practices

(eg orchard spraying, cowshed operations, haymaking, crop harvesting, land cultivation, aerial topdressing).

(iii) In the Reserve (Active), Coastal, Karangahake Gorge and Rural Zones Rule 8.3.1.3.(1) shall not apply to:

(1) permitted outdoor recreational activities; or

(2) temporary events that do not involve *motor sports*, firearms or amplified sound systems.

(iv) In all *zones*, noise from fire appliance sirens and call out sirens for volunteer brigades shall not be subject to these noise standards, subject to the *best practicable option* always being adopted to minimise noise levels.

(e) Location of Noise Measurement Requirements

(i) Noise levels are to be measured as specified in the above standards.

(ii) For the purpose of this standard the following definitions in Section 4 shall apply:

(1) *Residential Property*;

(2) *Site*;

(3) *Notional Boundary*.

(2) VIBRATION

Refer to Performance Standard 8.3.2 - Vibration in the Ground.

(3) CONSTRUCTION NOISE

Construction noise emanating from a *site*, where construction activity is of limited duration and where the construction activity is not part of the ongoing land use activity, shall meet the maximum noise standards set out in the tables below for the various *zones*, and shall be managed, measured and assessed in accordance with New Zealand Standard 6803:1999 Acoustics – Construction Noise.

(a) Maximum noise standards for construction noise received in the following *zones* are set out in the table below:

(i) Rural Zone;

(ii) Residential Zone;

(iii) Low Density Residential Zone;

(iv) Marae Development Zone;

(v) Coastal Zone;

(vi) Karangahake Gorge Zone;

(vii) Conservation (Indigenous Forest) Zone;

(viii) Conservation (Wetland) Zone;

(ix) Reserve (Passive) Zone;

(x) Reserve (Active) Zone.

Time of Week	Time Period	Typical Duration (*dB*)		Short Term Duration (*dB*)		Long Term Duration (*dB*)	
		L_{Aeq}	L_{Amax}	L_{Aeq}	L_{Amax}	L_{Aeq}	L_{Amax}
Weekdays	0630 - 0730	60	75	65	80	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	80	55	85	55	85
	1800 – 2000	45	75	45	75	45	75
	2000 – 0630	45	75	45	75	45	75

Note: NZS6803:1999 defines "Typical Duration" as meaning construction work at any one location for more than 14 calendar days but less than 20 weeks. Short-term and long-term durations are less than and greater than this period respectively.

(b) Maximum noise standards for construction noise received in the following *zones* are set out in the table below:

(i) Town Centre Zone;

(ii) Township Zone;

(iii) Flood Ponding Zone;

(iv) Industrial Zone.

Time Period	Duration of Work		
	Typical Duration	Short Term Duration	Long Term Duration
	L_{Aeq} (*dB*)	L_{Aeq} (*dB*)	L_{Aeq} (*dB*)
0730 – 1800	75	80	70
1800 – 0730	80	85	75

Note: NZS6803:1999 defines “Typical Duration” as meaning construction work at any one location for more than 14 calendar days but less than 20 weeks. Short-term and long-term durations are less than and greater than this period respectively.

(4) OTHER CONTROLS ON NOISE NUISANCE

Notwithstanding compliance with the above standards any activity must also comply with the provisions of the Resource Management Act 1991 and the Health Act 1956.

8.3.1.4 RESTRICTED DISCRETIONARY ACTIVITY MATTERS

(1) The *Council* will restrict the exercise of its discretion to the ability of the activity or development to achieve the particular environmental result in Section 8.3.1.2 of the Standards in Rule 8.3.1.3 for which compliance is not met and the following relevant matters:

(a) Whether the noise is intermittent, seasonal or of a short-term or temporary nature.

(b) The times of day of the activity and the possibility of night-time activities.

(c) Whether the activity has an effect on the existing background noise level.

(d) Whether the noise adversely affects the health of the community or *amenity values* of the area.

(e) Whether the *best practicable option* has been adopted to control the noise.

Note: The "*Excessive noise*" provisions of the Resource Management Act 1991 (Sections 326-328) apply in addition to the performance standards above.

8.3.2 VIBRATION IN THE GROUND

8.3.2.1 DISCUSSION, PURPOSE AND REASONS

(1) INTRODUCTION

(a) Ground vibration from land use activities can range in effect from structural damage to buildings (relatively extreme level of vibration) to disturbance of sleep and reduction of amenity as a result of people being able to perceive vibration. It is considered that ground vibration standards should be set in terms of human perception rather than in relation to the structural implications for buildings, thus ensuring that the amenity values of any area are not unreasonably compromised.

(b) Measurement of vibration is taken in the ground rather than in affected buildings, as buildings respond differently and thus the vibration response in the building may amplify ground vibration. It is beyond the scope of this standard to define that response.

(2) TYPES OF GROUND VIBRATION

(a) Ground vibration may be continuous or transient, with transient vibration being either impulsive or intermittent vibration.

(b) Continuous vibration is vibration that remains uninterrupted over a given time period, typically a period of several minutes or more (eg vibration generated by construction equipment such as impact and vibratory rollers).

(c) Impulsive vibration is a short duration isolated event, that involves the rapid build up of vibration then decay, that may comprise a single pulse or a number of pulses (eg vibration generated by blasting).

(d) Intermittent vibration is a string of vibration incidents, each of short duration and separated by intervals of a much lower vibration magnitude (eg vibration generated by pile driving and traffic).

(e) Acceptable levels for continuous vibration are considerably less than those for transient vibration.

(3) CONTINUOUS VIBRATION

(a) In setting standards for ground vibration, it is accepted that a certain amount of continuous background vibration occurs as a result of existing activities (eg industry, traffic). Accordingly, continuous vibration levels are set in relation to background or ambient levels ($V_{background}$). The ground vibration levels from a particular activity will have to exceed the background level by a generally perceptible amount (deemed to be 0.5mm/s) not to meet this standard. It will be up to persons who wish to undertake any particular activity to demonstrate to Council's satisfaction that the standard is being met. This will include providing the Council with information regarding background vibration levels.

(b) Continuous ground vibration levels are measured in terms of the 99 percentile value. This means that for one per cent of any nominal 60 minute period, $V_{background}$ plus 0.5mm/s could be exceeded.

(c) Ground vibration levels are set in terms of $V_{background}$. Hence it is not necessary to:

(i) provide different standards for day and night occurrences; and/or

(ii) provide different standards for different zones.

(4) TRANSIENT VIBRATION

(a) Isolated vibration events that occur infrequently and/or irregularly, eg only a few times a day, present special concerns to residents and accordingly must also be addressed and managed. This will be done by setting an appropriate standard for transient vibration, to ensure that amenity values are maintained at a reasonable level. Any transient vibration in excess of the standards set may be considered through the resource consent process and the standards set out in this rule will be used as a guideline in setting conditions.

(b) Vibrations from blasting are impulsive, of short duration and superimposed on background vibration levels.

(c) Human response to transient vibration can be wide ranging, with the same event being imperceptible to some persons, while causing nuisance to others.

(d) The standards set to control transient vibration are based on international standards, and monitoring and experience, developed to protect and preserve amenity values.

(e) In considering transient vibration from the perspective of human perception the following levels have been adopted:

Transient Vibration Level	
less than 0.5mm/s	imperceptible (threshold of perception)
0.5mm/s – 2.0mm/s	slightly perceptible (barely noticeable)
greater than 2.0mm/s	distinctly perceptible (noticeable)

(f) Transient vibration levels in excess of 5mm/s have the potential to compromise amenity values.

(g) As the vibrations are of relatively short duration where V_{max} is controlled to avoid nuisance the statistical analysis to obtain 99 percentile vibration levels is of little meaning, as the results depend on the length of vibration record. Accordingly, when monitoring vibrations, the control will be in terms of V_{max}.

(h) Blasting events should be designed in such a way as to comply with the standards set. However, the Council recognises that the prediction of the maximum ground vibration experienced from any particular blast event is dependent upon distance from source, ground conditions, and design of the blasting pattern. A complex relationship exists between these factors and therefore occasional exceedances of V_{max} may occur.

(5) VIBRATION FROM HEAVY VEHICLES

(a) Ground vibration generated by heavy traffic on roads is a difficult matter to manage. Where a road surface is not in sufficiently smooth condition, vibration from heavy trucks measured at the road boundary may well exceed the V_{max} level set. To enforce compliance may require road closure, which is not a practical option. Immediate upgrading of the road surface is also not a solution.

(b) As ground vibration normally dissipates relatively quickly with distance it is proposed that V_{max} levels arising from vehicle induced vibration be measured inside the property at the front yard boundary within any lot. Thus in the Residential Zone, a V_{max} will still apply and this is appropriate as it will discourage heavy vehicles from using residential streets.

(c) However, in the Town Centre and Industrial Zones no front yards are required and buildings may be erected on the road boundary. As the state highway is routed through the town centres of Paeroa, Waihi and Ngatea (and several townships as well), it is considered impractical to set a V_{max} in these areas.

8.3.2.2 ENVIRONMENTAL RESULTS

(1) To ensure that vibration levels generated by land use activities do not adversely affect the amenity values enjoyed by other land users.

8.3.2.3 STANDARDS

(1) CONTINUOUS VIBRATION

The 99 percentile ground vibration levels (V_{max}) resulting from any land use activity ($V_{activity}$) shall not exceed the background vibration level ($V_{background}$) by more than 0.5mm/second.

(2) TRANSIENT VIBRATION

(a) The maximum limits and parameters for ground vibration exposure resulting from activities other than those using explosives or similar impulsive and energetic material are:

Parameter	Standard
Monday to Saturday 0700 – 1800	5mm/second peak amplitude (V_{max})
All other times and on Sundays and public holidays	1mm/second peak amplitude (V_{max})

(b) The maximum limits and parameters for ground vibration and overpressure exposure resulting from activities using explosives or similar impulsive and energetic materials are:

Parameter	Standard
(1) Blast Event[1] Duration as defined by the delay timing (ie the difference in time between the first and last charge detonation)	1 second
(2) Number of Blast Events[1] per *holding*, or, for *exploration* activities, per *exploration* or *mining* permit area	3 per day, separated by an interval of not less than 10 minutes between blast events[1], and no more than 21 within a calendar year
(3) Overpressure (P_{max})	120dBL
(4) Peak Amplitude (V_{max})	5.0 mm/second
(5) Time of Day	0700 – 1800
(6) Days	Monday to Saturday (excluding public holidays)

[1]For the purpose of the above standard a 'blast event' means an individual or number of linked individual blasts of not more than the total duration period specified in (1) above.

(3) MEASUREMENT OF OVERPRESSURE, AND OF CONTINUOUS AND TRANSIENT GROUND VIBRATION

(a) All measurements shall be taken at or within the boundary of any *allotment* not owned by the agency responsible for creating the vibration.

(b) For the Rural, Coastal and Karangahake Gorge Zones only, measurements shall be taken within the *notional boundary*.

(c) Vibration measurements are to be taken in the ground not within *buildings*.

(4) VIBRATION FROM HEAVY VEHICLES ON PUBLIC ROADS

Within the Residential Zone only, the 99 percentile ground vibration levels (V_{max}) resulting from *heavy vehicles* ($V_{activity}$) shall not exceed the background vibration level ($V_{background}$) by more than 0.5 mm/sec, when measured at the *front yard* boundary within any residential *lot*.

8.3.2.4 EXPLANATION OF STANDARDS

(1) Ground vibration levels referred to in this Standard for $V_{Activity}$ and $V_{Background}$ are 99 percentile values of instantaneous Peak Particle Velocities calculated from the vector sum of the three orthogonal components of vibration occurring within the frequency range of 2Hz - 200Hz.

(2) The velocities must refer to a specific time, ie:

$V_{(t)}$ TOTAL = ($V_{(t)}$ Radial² + $V_{(t)}$ Transverse² + $V_{(t)}$ Vertical²)½

The 99 percentile of a set of vibration events is the vibration value which is exceeded by 1 per cent of the events recorded over the period of time measured.

(3) The V_{max} level referred to in this Standard is the maximum value of instantaneous peak Particle Velocities calculated from the vector sum of the three orthogonal components of vibration occurring within the frequency range of 2Hz – 200Hz ($V_{max} = V_{activity} + V_{background}$).

(4) Measurement periods to establish background ground vibration levels ($V_{background}$) shall, as a minimum, consist of a continuous interval which is of at least 60 minutes duration during a typical day. It is not feasible to measure $V_{activity}$ directly. It is determined by comparing $V_{background}$ with $V_{background}$ plus $V_{activity}$. Consequently, where $V_{activity}$ is being considered, the measurement period selected to determine combined ground vibration levels ($V_{background} + V_{activity}$) will relate directly to the period during which the activity is occurring.

(5) The discrete sampling interval employed during each measuring period shall be selected to avoid distortion or bias to recorded vibration values due to activities not directly associated with the activity under consideration. (Normally the discrete sampling interval will be 1 second). The resulting combined vibration levels ($V_{background} + V_{activity}$) shall then be statistically analysed and compared with $V_{background}$ to determine compliance with the standard.

(6) The vibration frequency band width which is to be monitored is nominally 2Hz - 200Hz but this may be varied by *Council* (particularly at the low frequency end of the range) on a case by case basis to reflect the capability of commercially available vibration monitoring systems.

(7) For resource consents, transient ground vibration is typically set in terms of a 95 percentile, and may include a maximum limit. The percentile limit will generally be applied to the design of each and every blast so that induced disturbances will not exceed the 95 percentile limit on more than 5 per cent of occasions (and will never exceed the maximum limit where set). The 95 percentile limit has little meaning for the activities that are permitted under the transient ground vibration limits set in this standard as the derivation of the relationship between explosive charge, distance and ground response required to undertake such a design can only be achieved through a series of trial blasts. Accordingly, it is the V_{max} level as referred to and defined in this standard that is the performance standard for transient ground vibration.

8.3.2.5 RESTRICTED DISCRETIONARY ACTIVITY MATTERS

(1) The *Council* will restrict the exercise of its discretion to the ability of the activity or development to achieve the particular environmental result in Section 8.3.2.2 of the Standards in Rule 8.3.2.3 for which compliance is not met and the following relevant matters:

(a) Whether the vibration adversely affects the *amenity values* of the area, especially residential *amenity values*, taking into account (but not limited to) the following factors:

(i) the total project duration

(ii) the duration of each blast

(iii) the time at which blasting occurs

(iv) the number of blasts per day

(v) the amount by which the standard has been exceeded

(vi) the cumulative impact where more than one of the standards are exceeded.

(b) Whether the vibration is intermittent or of a temporary nature.

(c) Whether the vibration specific to the activity has an effect above the existing background level.

(d) Whether the best practicable option has been adopted to control vibration.

(e) Where one or more of the standards in 8.3.2.3 is exceeded, the *Council* will assess the need to reduce any of the other standards to ensure an appropriate level of vibration effect to maintain the *amenity values* of the locality.

Note: The "*Excessive Noise*" provisions of the Resource Management Act 1991 (Sections 326 – 328) apply in addition to the Standards above.