MalcolmHuntAssociates

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Client Name:	Brenda O'Shaughnessy Senior Resource Management Planner Planning Wanganui District Council
Project Reference:	Plan Change 41 – Expert Comment On Noise & Vibration Issues Raised By Submitters
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RE: Noise Advice – Plan Change 41

Brenda,

As you are aware, Plan Change 41 updates the noise and vibration assessment methods in accordance with best practice, as well as local NZ Standards and international guidelines. The Plan Change provided for a clarification of the District Plan "noise and vibration" objectives, policies, rules and methods are also included as part of the Plan change.

Since public notification of the plan change, a number of noise and vibration issues have arisen among staff from the matters raised within submissions received. You have sent me specific questions which I respond to as follows;

1. Audible Bird Scaring Devices

The submissions received identify a range of issues with this rule. These are summarised as;

- currently bird bangers generate excessive noise nuisance
- bird scaring devices affect peace and quiet
- bird scaring devices affect animals, native birds,
- In people these sounds can affect sleep patterns and affect health of community
- Bird scaring devices become ineffective in a short while
- Westmere contains high population

The issues raised by submitters appear to focus on excessive bird banger noise emitted from a certain strawberry farm at Westmere which uses these measures extensively for crop protection during the late summer. It appears that the use of bird bangers has far exceeded the proposed rules with a far higher level of noise effect, compared to the maximum values provided for in this rule.

The key limit on noise effect is the single event limit on each "bang" of a gas gun to not more than **LAE 75 dB** measured within the notional boundary of any rural dwelling or at any point within a residential zone. This is not a very loud sound. In order to meet the required limits, only 6 such events are permitted within any 60 minute period. This is a relatively modest amount of sound that would create adverse effects only over a small area immediately adjacent to the gun location.

This is based on calculations of noise exposure. Six events at LAE 70 dB every 60 minutes works out to represent the same noise effect of LAeq(15 min) 47.2 dB, based on the "equal energy" principle. This is considered a low level of sound exposure. In terms of maximum sound levels (L_{AFMax}), each bang must register not more than LAE 75 dB which is equivalent to the LAFMax 65 dB.

For comparison purposes, rural zone permitted activity noise standards for adequate protection of health and amenity are:

Rural

Noise emission levels from permitted activities shall not exceed the following limits at any point within the notional boundary of any dwelling unit, other than a dwelling unit on the same site as the activity or at any point within any residentially zoned site;

7.00am to 7.00pm [Daytime]	*50 dB $L_{Aeq\ (15min)}$*
7.00pm to 10.00pm [Evening]	*45dB $L_{Aeq\ (15min)}$*
10.00pm to 7.00am [Night time]	*40 dB $L_{Aeq\ (15min)}$*
10.00pm to 7.00am [Night time]	*75dB L_{AFmax}*

Comparing these 'permitted activity" noise standards to **LAeq(15 min) 47.2 dB** and **LAFMax 65 dB** indicates the reasonableness of the recommended bird banger noise limit in terms of permitted noise levels. The amount of daily banger noise permitted by the proposed noise rule lies between day time and night time noise limit.

It is clear the use of gas guns in the district has been unregulated such that neighbours have experienced high sound levels from gas gun (mis)use and noise annoyance. Historical readings show (depending upon the type of gas gun used), a buffer distance in the order of 200 to 300m (possibly more depending upon conditions) may be required before the level drops below LAE 65 dB. A greater separation distance may be required depending upon weather effects, gas gun type, topography etc. Any distance estimation needs to account for the fact that gas guns produce sound which is highly directional. The front to back ratio may vary between 10 to 20 dB depending upon the gun used.

Depending upon the receiver location, it appears the proposed rule would be effective in reducing gas gun noise from the Westmere area and may in fact rule out there use completely in some cases (e.g. small holdings with dwellings closer than 2 00 to 300 metres). The combination of the "one device per four hectares" and the buffer distances needed to achieve not more than LAE 75 dB at the notional boundary of the nearby dwellings mean the gas gun sounds are not too concentrated in rural areas, whilst also providing for the use of this form of bird control.

Recommendation:

Highlighted within some of the submissions, some other Councils have opted for a lower gas gun noise limit of LAE 65 dB as the preferred level of control over the volume of each bang. Technically, this would lower significantly the amount of sound received by neighbours and reduce those effects on the environment mentioned by submitters.

On the basis that lowering the single event limit to LAE65 dB will still enable limited use of gas guns in the district to control bird pests (but will require more careful placement away from sensitive sites), I recommend in response to concerns raised by submitters 2 to 14 that the single event noise limit of LAE 75 dB in Rule 17.5.7(b) be replaced with a limit of LAE 65 dB.

The submitters have not supported the rule however this is not surprising as the gas gun sound to which these neighbours have been subjected is likely to be 10 or 20 times louder than the recommended noise controls over gas guns.

2. Avian Bird Scaring Devices

Submitter 15 provides a comprehensive submission addressing the noise effects of both gas guns and avian distress alarms. The submitter is affected by gas guns of the nearby strawberry farm which uses gas guns but the submitter does not relate the effects of avian distress alarms (which make a very different sound and have a different effect compared to the impulsive sound from gas guns).

Noise from avian distress alarms are proposed to be controlled to a low level, not to exceed LAeq(15 min) 50 dB when measured within the notional boundary of any rural dwelling or at any point within a residential zone. Avian distress arms are electronic bird-scaring devices that produce a continuous or intermittent sound that either mimics a particular bird species distress call or disrupts the flock's social order by preventing the birds from communicating. The noise can resemble a cell phone ring, bird calls or a car alarm.

The evidence does not support the premise that these types of sounds have caused a significant adverse effects in the district and should be able to be adopted (at the 50 dB noise limit) provided they are adopted as part of a Bird Management Plan (which ensures all reasonable options are given consideration when implementing these types of alarms).

Recommendation:

No amendment is recommended to Rule 17.5.7(c).

3. Requirement For An Integrated Pest Management Plan For All Bird Scaring Devices

Submitter 15 requests an integrated pest management plan be required for all bird scaring devices. While the submitter has a point that the noise generated by gas guns and avian distress alarms should be justified in terms of these forms of control being consistent with the "BPO", we are concerned the impartiality of the submitter having been exposed to a high level of gas gun noise, far higher than that being promoted within the District Plan. It would not usually be considered necessary to have to prepare a bird management plan and submit this to Council in order to be able to use gas guns for bird control.

Recommendation:

No amendment is recommended

4. Submitter Requests Gas Guns & Avian distress alarms a minimum of 600m from high density residential properties

The same submitter requests that gas guns and avian distress alarms only be permitted when they are located 600 metres from "high density residential properties". This submitter has no experience with the low level of noise effects associated with the proposed noise rules governing these forms of bird pest control. This is because the adjacent strawberry farm appears to have generated excessive gas gun noise, at a level way beyond the maximum now being promoted in the District Plan (10 db reduction now proposed).

Overall , with the reasonable levels of gas gun noise emitted by such an activity operating in full compliance with the now recommended noise rules it is not considered necessary to limit the use of these items within 600 metres of residential sites. It is noted that based controls around distance only will not be conducive to developing gas guns that can be effective as an auditory deterrent within the cropped areas, but generate less noise "spill" into sensitive nearby areas.

Recommendation:

No amendment is recommended

5. NZTA Submission - Reverse Sensitivity - Noise & Vibration

Please see Attachment A which addresses the NZTA submission item-by-item.

Recommendation:

Please see Attachment A.

6. Alternative To Mitigation By Acoustic Insulation

Submitter 29 has raised the issue that rather than require acoustic insulation be incorporated into the habitable rooms associated with noise sensitive activities establishing in noise affected areas near state highways or near railway corridors, the submitter seeks an alternative be available which is to use fencing, screening or even natural terrain as this will in many cases reduce sound to levels below which it becomes necessary to insulate buildings and provide ventilation via mechanical means.

Recommendation:

A new rule providing this alternative is attached in *Attachment A* as new Rule 17.5.3 (b)iii

7. Vibration Standards

Submitter 28 submits the vibration performance standards *"...are not quantifiable and are therefore unworkable"*.

Throughout the Proposed Plan the permitted vibration standard states *"No activity shall cause a vibration considered offensive or objectionable."* We agree this is not an acceptable standard as it is not measureable.

Looking back to advice offered to Council on this matter, the MHA report states *"As there are no relevant NZ standards setting our recommended vibration limits and assessment methodologies, we recommend no vibration Standard be employed"*.

Recommendation:

We recommend specific rules covering vibration not be included in the District Plan. The early advice was that this is a difficult area with no NZ Standards recommended, a wide range of possible international candidates are around (but each has its drawbacks) and little in the way of guidance from other District Plans. The objectives and policies should still refer to vibration as an adverse effect. Where the effect is found to cause adverse effects, Council has a number of enforcement options open without relying on the District Plan to provide a performance standard.

8. Rural Activities

Submitter 29 requests:

8.1. <u>All rural machinery exempt from the noise requirements</u>, instead of only intermittent noise from rural machinery;

The currently worded exemption is for "mobile equipment" however why this term is used is a mystery as it deviates from the earlier MHA advice to Council which recommended *"..noise arising from livestock or from operation of mobile agricultural equipment associated with primary production [e.g. tractors, harvesters, and farm vehicles] is exempt from compliance with the noise limits for permitted activities in the rural Environment. This exemption does not apply to any fixed motors or equipment."*

The exemption for mobile rural equipment was based around this sound only being present for temporary time periods. However, intermittency is only part of the effect. For fixed rural sound sources such as pumps and motors these sources can be acoustically treated , screen and /or located away from sensitive sites. It is therefore important the BPO be put in place to ensure these fixed sound sources comply with the relevant requirements.

Unless the District Plan is to be slanted in favour of rural production over environmental protection, we do not recommend exempting all rural noise sources from having to comply with the permitted activity noise limits. It is important that reasonable benchmarks are established in rural areas so that noise effects of permitted activities are controlled to reasonably limit adverse effects on the environment, including people. We can see no good RMA reasons to exclude sounds from rural activities from compliance with the relevant District Plan noise limits.

<u>Recommendation:</u>
Recommend the following changes to definition of "noise":
d. Livestock noise and ~~intermittent~~ noise from <u>mobile</u> rural machinery in the rural zones.

8.2. Clarification that <u>airstrips and helicopter landing areas for rural purposes are excluded from the rural noise provisions</u>.

Firstly, "agricultural airstrips" are specifically excluded from the term "rural activities". Rural activities are those to which the permitted activity noise rules apply within the rural zone. These rules cannot be applied to aircraft sounds under the recommendations of NZS6802:2008, a Standard to be followed when assessing compliance with the permitted activity rural noise standards. Clause 1.2.1 of NZS6802:2008 states *"....assessment of specific sources of sound including ...flight operations of fixed or rotary winged aircraft associated with airports or helicopter landing areas, ...requires special techniques that generally are outside the scope of this Standard."*

Section 9(8) of the RMA prevents any Council from prescribing controls from aircraft in the air however Council does have the right under the RMA to prescribe controls for aircraft using landing areas, landing strips, or the airport.

Whilst it is fair to surmise that noise from airstrips and helicopter landing areas for rural purposes are excluded from the having to comply with permitted activity noise standards for the rural zone, it is fair to say that Council remain responsible for managing this noise and may do so using either of the following Standards;

- NZS6807:1994 *Noise Management and Land Use Planning for Helicopter Landing Areas noise provisions*

- NZS 6805:1992 *Airport Noise Management and Land Use Planning*

8.3. Amend The Daytime Noise Levels To Start At 6am Which Reflects Standard Rural Operating Practice

The relevant guidance around setting of hours for purposes of regulating noise rules is covered within NZS6802:2008. The relevant recommendation is set out within Table 3 of this Standards which states;

> *The definition of times of day are a matter for the relevant local authority and should recognise that a period of not less than 8 hours needs to be provided for sleep to ensure at least the minimum acceptable degree of health protection.*

As the "night time: as defined within the District Plan commences at 10pm in the rural zone, a 6 am start to "daytime" in the rural zone would retain a lower night time limit over the requisite 8 hours. Considering the overall merits of allowing the higher daytime noise limit to commence 1 hour earlier, it is not likely that adverse effects would be experienced within rural zones. As the proposal is to only adopt the 6 am daytime start time to the noise performance standard for permitted activities in the Rural Zone, farmers will need to ensure noise received within adjacent zones are maintained at the lower night time limit until 7 am. Owing to the nature of dairying, pastoral farming, horticulture etc. ,it is not considered likely that a noise conflict would occur for the 1 hour overlap at the zone boundaries where the night time limit would apply to noise received from rural activities until 7am in the morning.

Examining the positives and negatives, on balance we would recommend granting the submitter's request for the daytime noise limit to commence at 6 am in the rural zone as this would enable noisy activities to commence at times more commensurate with rural lifestyles, unless there are planning reasons for not doing so.

Recommendation:

Recommend amending the daytime noise limit to commence at 6 am in the rural zone.

Please do not hesitate to contact the writer is there any further questions.

Yours faithfully,

Malcolm Hunt B.Sc., M.E.(mech), Dip Public Health, RSH Dip Noise Control

ATTACHMENT A: Response to NZTA Submission – Plan Change 41

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Date of Issue:	26 August 2015
Client Name:	Brenda O'Shaughnessy Senior Resource Management Planner Planning Wanganui District Council
Project Reference:	Reverse Sensitivity Noise Advice – NZTA Appeal Plan Change 36 & Plan Change 41
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RE: Reverse Sensitivity Noise Advice – NZTA Appeal Plan Change 36 & Plan Change 41

Brenda,

I have reviewed the documentation you provided regarding reverse sensitivity issues relating to the NZTA Appeal of Plan Change 36 and the same issues traversed within the submissions received for Plan Change 41. Below we comment on the findings of our review, setting out the rationale for the acceptance and non-acceptance of certain plan provisions requested in the NZTA Appeal. The recommendations are made on the basis of the methods and procedures already set out in the District Plan to deal with noise and vibration reverse sensitivity which are based around a combination of 20 metre setback for dwellings adjacent to the highway and the noise insulation requirements for new habitable spaces located within 30 metres of a state highway designation.

First and foremost, we have focused on recognition of the existing approach of the District Plan in regard to dealing with noise and vibration reverse sensitivity issues. Where short-comings are identified, we prefer updating and amending of the existing approach of the district plan, recommending specific amendments to the existing district plan provisions that reflect a need for the mitigation to be applied effectively and efficiently. The NZTA approach has been found to be defective in relation to aspects of methods recommended to for identifying those activities requiring acoustic protection and specifying acoustic insulation against outdoor noise.

Identification of Noise Sensitive Activities To Be Protected

The NZTA request prefers to adopt the Protected premises & facilities approach of NZS6806:2010. The District Plan already sets out an insulation regime based around protecting habitable rooms associated with noise sensitive activities. There are no compelling reasons t adopt the nomenclature of NZS6806:2010 which after all is only applied when assessing noise from new or altered roading projects. However, our review of the methods used to identify noise sensitive uses requiring acoustic protection triggered by the NZTA request has resulted in amendments to the District Plan definition to ensure the necessary range of sensitive uses are appropriately protected.

Method For Prescribing Acoustic Insulation

District Plan methods for stipulating acoustic protection of certain indoor spaces from outdoor noise needs to be easy to understand, reliable and simple for Council, building designers and users to understand and use. Acoustic standards for habitable buildings are controlled by the NZ Building Code, however insulation against outdoor sounds is not included.

NZTA request indoor acoustic protection be specified using an "**Indoor decibel method**". This means the decibel levels received (measured) within bedrooms and other habitable rooms are to be used as a performance standard to ensure an adequate level of protection is provided. While the "design" decibel levels adopted by NZTA are generally supported as acceptable, and are appropriate targets to achieve, proving compliance is achieved could be very difficult. This is due to both the inherent difficulties in measuring 24 hour sound levels in situations where all non-traffic sounds need to be excluded from the measurement results. This is in addition to the uncertainties of assessing compliance when different operators use different design assumptions let alone uncertainty associated with forecasting traffic flows and noise levels without adequate input information. Historically District Plan insulation standards have sometimes adopted the recommended indoor design decibel sound levels as appropriate performance standards, however this should be resisted by Council for the following reasons;

1) The Building Code adopts minimum acoustic performance standards for indoor noise based on acoustic performance of building elements, tested according to international standards with materials suppliers (and others) quoting the sound transmission qualities for every type of wall cladding, roofing, glazing, etc.. Rather than ask building designers to meet a specified indoor level of sounds from adjacent occupancies, the Building Code requires the walls, roof, etc to meet a minimum transmission loss standard. In this way design noise levels do not have to be estimated by each and every user of the rule and field testing (if required) can be simply undertaken using international standards specifically designed to assist in field testing.
2) We believe Council's have a special duty to consider the "workability" and enforcement matters associated with District Plan rules. This is achieved with a rule based around acoustic rating of the building. This method deals with much of the uncertainty around achieving an indoor decibel level. The recommended method for Council's to follow are those based on ISO 717:2013 The units are either Dtr,2m,NTw + Ctr.
3) "Target" type indoor decibel levels requested by NZTA (for example, a limit of no more than 35 dB in bedrooms and 40 dB in other habitable rooms) are worthy and commendable design aims, however Council's are recommended not to approve such rules for District Plans as they are uncertain in their outcome given the vagaries of traffic forecasting, assumptions by designers etc. let alone the difficulties of attempting to measure compliance in areas affected by sounds other than road traffic. The "Indoor decibel method" makes compliance more difficult to be certain of, especially as there are no specific NZ or international standards governing how to measure indoors against with an indoor performance standard. Thus, these types of rules do not work well for Council's which need District Plan acoustic performance standards that are clear with straight forward field testing using applicable international Standards. This is how the sound transmission requirements of the NZ Building Code are administered, a process Council's are fully familiar with.

Experience has shown the disadvantages of the "indoor decibel" method are ;

- External sound level must be predicted each time a new dwelling is designed.
- No design guidance is provided to the rule user in undertaking this noise prediction. This means the user of the rule may conduct noise predictions using uncertain inputs and make assumptions (e.g. regarding road surface) that may not hold true in the future.
- Imposes unnecessary costs and risks for the building designer and owner. Any risks associated with conducting an erroneous noise prediction or under-estimating future traffic flows are borne by the

owner or developer whereas the Agency responsible for roading corridor (and its effects) bears no risks in this regard.

- This "indoor decibel" method has particular disadvantages for council's regarding field testing, if required. There are no NZ standards or international standards specifically designed to assist with such testing. For example, traffic noise testing would require 24 hr testing – on which day should the test be conducted, and how to exclude non-traffic sounds found in the local environment?
- Leads to inconsistent design approaches to deal with outdoor noise with the result new insulated buildings (a) may achieve different required indoor sound levels in areas with the same outdoor noise environment, and (b) due to inadequate design, buildings housing noise sensitive activities may perform poorly in the long run.

The advantages of the ISO method of Rule 17.5.3 are;

- The designer is fully informed of the acoustic performance requirements the building must achieve (in a similar way to dealing with inter-tenancy noise within NZ Building Code procedures).
- The design is easy to check from plans. No traffic noise or rail noise calculations are required.
- Field testing (if necessary) is straight forward using existing international Standards designed for this purpose.
- There is an element of risk sharing as the design target for acoustic performance of the building facade has already been calculated and included in the insulation rule. There are consequently lower risks for the rule user and a greater expectation that the required insulation standard will be achieved compared to the above "indoor decibel" method.

Traffic Noise – SH 3 and 4 Whanganui District - Method Of Evaluation

With the assistance of WDC traffic engineers we identified the sections of state highway 3 and 4 that had a post speed limit <70 km/hr. In order to provide a suitable forecast of noise emissions from the highway over the life of the District Plan, an eleven year forecast was taken (to year 2025) based on annual growth of 2% compounding growth for 11 years[1]. Predictions of LAeq(24 hour) traffic noise were based on the NZTA website calculator using 95 km/hr, and the following AADT's and percentage heavy vehicles;

	AADT Yr 2025	% Heavy
SH3	5,386	18
	11,320	11
	9,399	15
SH4	1,247	16
	1,480	13

The following graph shows the calculated 24 hour traffic noise levels versus distance from the road.

[1] NZTA requested a 3 dB increase in traffic noise to account for future traffic growth. This is not agreed. This 3 dB allowance is equivalent to continuous 7% growth p.a. in AADT over 10 years. Such accelerated growth is likely to vastly over-predict vehicle using the highway in the future and therefore noise emissions.

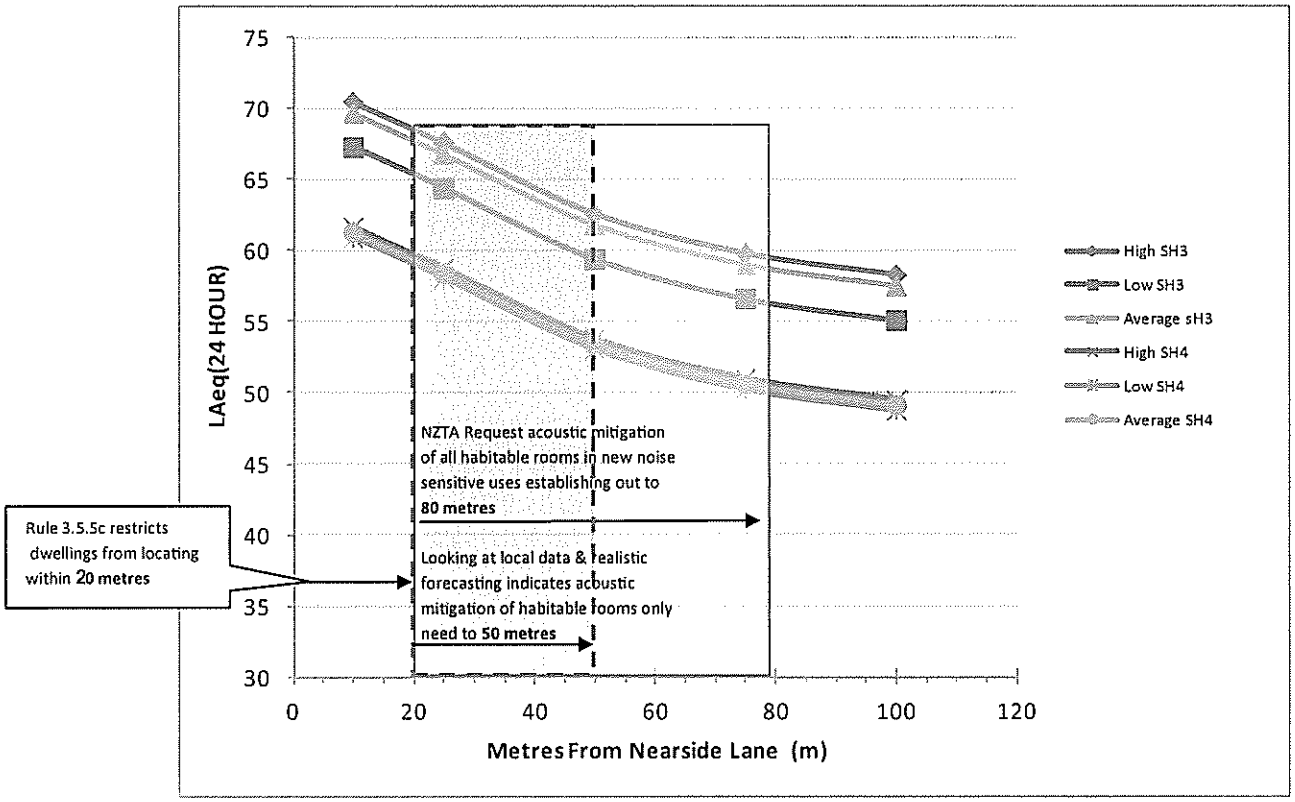


Figure 1 Predicted 24 hour LAeq traffic noise levels as a function of distance from road, 95 km/hr – SH3 and SH 4 AADT forecast for Year 2025.

By examining the expected night time $L_{Aeq(15\ min)}$ outdoor sound levels (being around 10 dB below the $L_{Aeq(24\ hour)}$ level for the same sound) and by taking typical dwelling acoustic performance into account (windows open and windows closed), we have determined traffic noise levels indoors would not exceed LAeq(15 min) 35 dB indoors at night within bedrooms with partially open windows located a distance of 50 metres or greater from the road edge. This is consistent with the recommended indoor sound level in bedrooms near busy traffic routes set out within NZS2107:2000 *Acoustics—Recommended design sound levels and reverberation times for building interiors.*

The District Plan rule (Rule 17.5.3) actually applies to noise sensitive uses establishing within 50 metres as measured from the edge of the designation. This potential extra distance to the actual edge of the highway (i.e. compared to the designation boundary) ensures worst case expected noise effects are taken into account if re-development of the highway takes place resulting in traffic lanes right out to the designation boundary.

Amendments To Rule 17.5.3

As set out attached, we have recommended some wording changes to the District Plan Rule 17.5.3 designed to address reverse sensitivity noise and vibration effects. These changes have arisen from a need to update the acoustic standards to the more recent versions, and to reflect them merits of some aspects of the NZTA appeal and submission on Plan Change 41.

In summary, Rule 17.5.3 has been amended along the following ,lines;

1. The acoustic treatment (or certification that none is required) is now only prescribed for habitable rooms within 30metres for the designation for parts of date highway 3 where the posted speed limit exceeds 70 km/hr
2. The naming of the acoustic specification has slightly changed as a result of the new technical standards.
3. The new, more up to date technical standards are the two references.
4. Because new dwellings can be of all types of design and construction, the comparison to the acoustic performance of a new dwelling is not helpful.

5. A new requirement offers the alternative to avoid acoustic insulation where the effects of screening or terrain mean that the sound levels within the 30 metres distance do not exceed that the stated limits. On this basis the noise effects would not warrant the acoustic treatment required by this rule.
6. Two additional proviso's have been added as per the NZTA appeal request – in order to more clearly signal the requirements for mechanical ventilation (which should be able to operate over a sufficiently broad range and not be noisy in operation).

Please do not hesitate to contact the writer is there any further questions.

Yours faithfully,

Malcolm Hunt B.Sc., M.E.(mech), Dip Public Health, RSH Dip Noise Control

	Amendment sought by Appellant	Respondent Response	
3.4 Rules – Rural Production Zone Rule 3.5.5 Permitted Activities 3.5.5(c)	*"~~Dwellings~~ The following new structures must~~shall be located at least;~~* *i. in respect of a PPF, be located at least 20 metres from the nearest traffic lane of a state highway where the posted speed is at least 70km/hour, and at least 20 metres of any state highway designation that does not contain an existing state highway.* *Ii in respect of dwellings, be located at least 10 metres from ~~any other side or rear~~ boundary;* *~~iii. 10 metres from any other front boundary.~~"*	**Accept** Accept the term "dwellings" does not fully describe the range of activities sensitive to noise. The term "Protected Premise and Facilities" is a specific term adopted in NZS6806:2010. However the term "Noise Sensitive Activity" is already defined in Wanganui Proposed Plan and suitable for this purpose. Comment: Use term' noise sensitive activity" in place of PPF **Decline** • Use of "PPF" not accepted as it is not needed. • No designations in the district currently that do not contain a State Highway. • Decline removal of "10 metres from any other front boundary" as this is avoids developing noise sensitive activities close to streets and non-state highway roads where noise effects may be significant.	**Recommended Wording;** ~~Dwellings~~ New Noise Sensitive Activities shall be located at least; i. 20 metres from the nearest traffic lane of a state highway where the posted speed is at least 70km/hour, or at least 10 metres from any other side or rear boundary; iii. 10 metres from any other front boundary
New Rule to be added as 3.7.9a, 3.9.13a, and 3.11.11a	*"Any new PPF must be located at least 20 metres from the nearest traffic lane for any boundary adjacent to a state highway where the posted speed is at least 70km/hour and at least 20 metres of any State highway designation that does not contain an existing State highway."*	**Accept** Accept need to maintain a setback to the high speed parts of highway network to avoid adverse noise and vibration effects. **Decline** Do not support the protection of a designation where this does not already include a state highway.	**Recommended Wording;** *"Any new PPF must be located at least 20 metres from the nearest traffic lane for any boundary adjacent to a state highway where the posted speed is at least 70km/hour.*

Od acoustic New Rule be added as Rule 3.5.5g, 3.7.9b, 3.9.13b, and 3.11.11b:	*Within 80 metres of the edge of the nearest traffic lane of any State highway or within 80 metres of any State highway designation that does not contain an existing State highway, any new PPF or any alteration to a PPF beyond 10% of the existing gross floor area, shall be designed and constructed to comply with the following design sound levels:* *i) Road-traffic noise of **35 dB LAeq(24hr):*** *a. in respect of educational buildings, inside all assembly halls, lecture rooms and theatres, and music studios: and* *b. inside all places of worship and marae.* *II) Road-traffic noise of **40 dB LAeq(24hr):*** *a. in respect of residential buildings, inside all habitable spaces;* *b. in respect of educational buildings, inside all conference rooms, drama studios, sleeping areas, and teaching areas; and* *a in respect of health facilities, inside all wards and sleeping areas; and* *Road-traffic noise of **45 dB LAeq(24h):*** *a. in respect of educational buildings, inside all libraries; and* *b. in respect of health facilities, inside all clinics, consulting rooms, theatres, and nurses' stations.* *If windows must be closed to achieve the design sound levels, the building must be designed, constructed, and maintained with a ventilation and cooling system. For habitable spaces a ventilation and cooling system must achieve the following:*	**Decline** Do not support the proposed wording for following reasons; • Use of PPF is not supported as the Plan already adequately defines sensitive activities to be protected; • The wording used is deficient as the term "PPF" is not needed to classify "noise sensitive activities" to be protected. • Use of "road traffic noise" as a performance standard is a problematic concept given the definitions in this Plan which mean the term "noise" cannot include the sounds of vehicles being driven along a road. • The NZTA approach does not acknowledge reverse sensitivity protection already afforded by the District Plan (especially of critical listening areas and sleeping areas) addressed within **Rule 17.5.3** which is provides a basic mechanism designed to manage the effects of traffic noise in areas adjacent to state highways. • NZTA approach conflicts and contrasts with PDP approach to dealing with reverse sensitivity effects adjacent to state highways. Overall, the requested wording is too prescriptive, indoor sound levels being difficult & complex to base compliance on. Compared to the existing District Plan approach whereby the building's minimum acoustic performance is specifically stated (and a type-approval provided for common construction type), the highly variable and not easily predicted future level of traffic noise measured indoors is not a suitable basis for a District Plan acoustic insulation rule. While the general performance standards are agreed to as needed to protect health and well-being (once converted to shorter term average sound levels	**Recommended Wording;** *..see amended Rule 17.5.3 attached.*

	iv) Ventilation must be provided to meet Clause G4 of the New Zealand Building Code. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(24h) when measured 1m away from any grille or diffuser. *v) The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.* *vi) The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB LAeq(30s)when measured 1 m away from any grille or diffuser.* *Prior to construction, a design report prepared by an acoustics specialist shall be submitted to the District Council to demonstrate compliance with this rule. The design report must take into account the future permitted use of the State highway. For existing roads this must be done by the addition of 3 dB to existing measured or predicted levels.*	for day time and night time), however the indoor sound level method for specifying insulation requirements is considered too uncertain and technically bereft to form a viable basis of District Plan building acoustic performance standard. • Compared to acoustic insulation standards that specify the minimum acoustic reduction of buildings, rules based on sound levels received indoors are problematic because; 1) The prediction is fraught with difficulties and inconsistent results are likely between rule users. 2) There are no simple Standards to follow to measure such levels indoors; 3) The measurements take 24 hours minimum per room; 4) It is difficult to exclude non-traffic sounds; • The use of "LAeq(24 hr)" as an indoor indicator of acoustic acceptability is not supported , compared to the ISO method for specifying sound insulation of the building envelope. • The approach sought by NZTA is a 'one size fits all" approach to managing the issue, yet noise levels vary considerably throughout the network. Analysis carried out based around forecast traffic noise levels along the relevant portions state highways in the Whanganui district indicate many areas where additional controls (such as those sought by NZTA) are not needed. Low traffic volumes expected over the life of the District Plan, in many isolated sections of state highway do not require any additional controls promoted by NZTA. • The requirement to address noise up to 80 metres from the state highway has been found to be unnecessary and would be an inefficient method for dealing with reverse sensitivity noise effects. This	*..see amended Rule 17.5.3 attached.*

		has been checked by examining future traffic noise following 11 years of growth of the latest 2014 traffic counts. Using forecast AADT's at year 2025 (based on 2 % growth compounding p.a.) and a maximum indoor sound level not exceeding LAeq(15 min) 35 dB at night time in bedrooms, it has been calculated that acoustic treatment of dwellings (with ventilation also addressed) is only necessary out to a distance of **50 metres** from the designation boundary. This is only needed for those parts of State Highway 4 that are posted with a signed speed limit exceeding 70 km/hr. • By measuring the 50 metre "insulation area" from the designation boundary (as opposed to the edge of the highway itself) an allowance is provided for noise changes due to any road alterations within the designation boundary. Thus, the approach is future-proofed in terms of re-development of the highway closer to the receiver, within the existing designation. • Future traffic noise levels predicted those parts of State Highway 3 (> 70 km/hr speed limit) indicate the 20 metre setback and the basic insulation qualities of a typical welling will be sufficient to address noise and vibration reverse sensitivity concerns. • Based on our calculations, rational predictions of future roadside noise levels beyond 50 metres from the edge of the highway do not warrant any additional controls beyond the provisions of district-wide **Rule 17.5.3.** • Given Wanganui's climate, there is no need to provide a cooling function within the ventilation requirements.	*..see amended Rule 17.5.3 attached.*

		Accept General concept agreed to ensure the district plan provides adequate noise and vibration reverse protection for state highways. Accept the following as additions to the ventilation requirements set out within **Rule 17.5.3** on the basis that this enhances the methods for specifying the correct ventilation requirements (including avoiding systems that are noisy when they operate across the required range). Note the amended noise unit for describing sound from the ventilation system, this should be based on a 30 second assessment period, not the 24 hour value requested by NZTA.; *iv) Ventilation must be provided to meet Clause G4 of the New Zealand Building Code. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(30 secs) when measured 1m away from any grille or diffuser.* *v) The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.* **Comment** Apart from adding the above two provisions, it is recommended to amend Rule 17.5.3 in order to improve the degree of acoustic protection in areas where such protection of indoor spaces requires improved protection. The basis of rule 17.5.3 has similar target indoor sound	*..see amended Rule 17.5.3 attached.*

		levels as per the NZTA request, but this is translated into a minimum construction standard, accompanied by a ventilation requirement to avoid the need to open windows. A number of NZTA's concerns can be met within the following recommended amendments to Rule 17.5.3 to better account for the concerns raised by NZTA: 1) Increasing the acoustic requirements to 50 metres from the nearside edge of the highway for those parts of State Highway 3 with a >70 km/hr speed limit. 2) Updating the ISO Standards and naming conventions to reflect the latest international standards. 3) Introducing flexibility so that insulation is not required where, due to terrain or site screening, the outdoor sound level is not likely to exceed 55 dB LAeq(24 hr), as determined by an expert report accepted by Council.	
New definitions be added to Chapter 13 for "**Habitable Space**" and "**Protected Premises & Facilities**"	*"Habitable space means: a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water-closet, pantry. walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods.*	**Comment:** The term "habitable Space" is already defined in the District Plan as "*..means any room in a dwelling that is used or that can be used as a sitting room, a living room, a bed room, a dining room or a family room.*" This definition only describes the rooms to be protected in dwellings and falls short of including the full range of buildings housing noise-sensitive activities that need to be acoustically protected under Rule 17.5.3. Omissions of note are "marae", "teaching and sleeping rooms in educational facilities" and "rooms used for overnight medical care". These are recommended to be added to ensure the necessary range of rooms protected from outdoor noise.	**Recommended Amendment:** ***Habitable Spaces*** *means any room in a dwelling that is used or that can be used as a sitting room, a living room, a bed room, a dining room or a family room "or rooms used for teaching or sleeping in education facilities, rooms within communal buildings located on marae, and rooms used for overnight care at medical facilities."*

		Accept in Part: Amended definition to include those "non-dwelling" sensitive rooms that also require acoustic protection.	
	Protected premises and facilities (PPFs) means: • *Spaces in buildings used for:* • *residential activities* • *marae* • *overnight medical care* • *teaching (and sleeping) in educational facilities* • *playgrounds that are part of educational facilities that are within 20m of buildings used for teaching purposes.* *PPFs are the locations where road-traffic noise is assessed and for which noise mitigation measures may be required."*	**Comment:** The District Plan methods for addressing reverse sensitivity noise and vibration effects associated with the operation of the state highway do not realistically need to refer to such noise sensitive activities and locations as per the term "PPF". This term derives from NZS6806:2010 *Acoustics – Traffic Noise – Noise From New & Altered Roads* which is a Standard referred to within the District Plan. It is recommended the term PPF only be adopted for use in the District Plan if or where the provisions refer to assessing effects of noise from new or altered roads. This is a separate consideration to the issues raised by NZTA which relate to methods for dealing with reverse sensitivity noise and vibration effects on land adjacent to state highways.	**No amendments recommended.**

Proposed Amendments to Rule 17.5.3

(New Text = underlined, Deleted Text = ~~strikeout~~).

17.5.3 Noise Sensitive Activities (including dwellings).

New or relocated buildings for a noise sensitive activity on any site within any rural, commercial or industrial zones (excluding the Airport Enterprise Zone) ~~or~~ within 30 metres of a railway designation or within 50 metres of any portion of the state highway 3 designation to which with a signed speed limit exceeding 70 km/hr applies shall comply with the following:

a. Any habitable space within a new or altered building shall be designed to achieve an insulation rating of no less than:

~~DnT,w+ Ctr > 30 dB~~ $D_{2m,nT,w}$ + Cr > 30 dB

for the external building envelope of each habitable room when tested and verified in accordance with the following standards:

i. ~~AS/NZS1276.1:1999 Acoustics- Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation~~. AS/NZS ISO 717.1:2004 *Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation*

ii. ~~ISO 140-5:1998 Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements Part 5: Field Measurements of Airborne Sound Insulation of Façade Elements and Facades.~~ ISO 16283-1:2014 *Acoustics -- Field measurement of sound insulation in buildings and of building elements -- Part 1: Airborne sound insulation*

b. Compliance with this performance standard shall be achieved when the design and construction of each habitable room:

i. accords with the exact construction specification and schedule as set out in 17.6.

~~Note: A new dwelling constructed to the Building Code will comply with this performance standard.~~

or

ii. an acoustic design certificate is provided to Council by a suitably qualified and experienced acoustic engineer (suitable to Council) which confirms that when built to the recommended design and specification will achieve the minimum acoustic insulation standard of ~~DnT,w+ Ctr > 30 dB~~ $D_{2m,nT,w}$ + Cr > 30 dB for the external building envelope of each habitable room.

or

iii. providing an acoustic design certificate prepared by an acoustic engineer acceptable to Council stating the outdoor noise level at the most affected exterior of the building containing the habitable room will be unlikely to exceed:

55 dB $L_{Aeq(1hr)}$ for rail traffic noise

57 dB $L_{Aeq(24hr)}$ for road traffic noise

c. If the above standard cannot be met with open-able doors and windows then:

i. Mechanical air ventilation shall be required in accordance with provisions of the New Zealand Building Code G4- Ventilation.

ii. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(30 secs) when measured 1m away from any grille or diffuser.

iii. The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.

MalcolmHuntAssociates

Date of Issue:	2 September 2015
Client Name:	Brenda O'Shaughnessy Senior Resource Management Planner Planning Wanganui District Council
Project Reference:	Reverse Sensitivity Noise Advice – NZTA Appeal Plan Change 36 & Plan Change 41
Document version:	Rev 3 Amended
Document Status	Final
Document	Malcolm Hunt

RE: Reverse Sensitivity Noise Advice – NZTA Appeal Plan Change 36 & Plan Change 41

Brenda,

I have reviewed the documentation you provided regarding reverse sensitivity issues relating to the NZTA Appeal of Plan Change 36 and the same issues traversed within the submissions received for Plan Change 41. Below we comment on the findings of our review, setting out the rationale for the acceptance and non - acceptance of certain plan provisions requested in the NZTA Appeal. The recommendations are made on the basis of the methods and procedures already proposed in the District Plan (PC 41) to deal with noise and vibration reverse sensitivity which are based around a combination of 20 metre setback for dwellings adjacent to the highway and the noise insulation requirements for new habitable spaces located within 30 metres of a state highway designation. The review of submissions received on Plan Change 41 has lead to the adoption of several further refinements which our outlined below.

First and foremost, we have focused on recognition of the existing approach of the District Plan in regard to dealing with noise and vibration reverse sensitivity issues. Where short-comings are identified, we prefer updating and amending of the existing approach of the district plan, recommending specific amendments to the existing district plan provisions that reflect a need for the mitigation to be applied effectively and efficiently. The NZTA approach has been found to be defective in relation to aspects of methods recommended to for identifying those activities requiring acoustic protection and specifying acoustic insulation against outdoor noise.

Identification of Noise Sensitive Activities To Be Protected

The NZTA request prefers to adopt the Protected premises & facilities approach of NZS6806:2010. The District Plan already sets out an insulation regime based around protecting habitable rooms associated with noise sensitive activities. There are no compelling reasons to adopt the nomenclature of NZS6806:2010 which after all is only applied when assessing noise from new or altered roading projects. However, our review of the methods used to identify noise sensitive uses requiring acoustic protection triggered by the NZTA request has resulted in amendments to the District Plan definition to ensure the necessary range of sensitive uses are appropriately protected.

Method For Prescribing Acoustic Insulation

District Plan methods for stipulating acoustic protection of certain indoor spaces from outdoor noise needs to be easy to understand, reliable and simple for Council, building designers and users to understand and use. Acoustic standards for habitable buildings are controlled by the NZ Building Code, however insulation against outdoor sounds is not included.

NZTA request indoor acoustic protection be specified using an "**Indoor decibel method**". This means the decibel levels received (measured) within bedrooms and other habitable rooms are to be used as a performance standard to ensure an adequate level of protection is provided. While the "design" decibel levels adopted by NZTA are generally supported as acceptable, and are appropriate targets to achieve, proving compliance is achieved could be very difficult. This is due to both the inherent difficulties in measuring 24 hour sound levels in situations where all non-traffic sounds need to be excluded from the measurement results. This is in addition to the uncertainties of assessing compliance when different operators use different design assumptions let alone uncertainty associated with forecasting traffic flows and noise levels without adequate input information. Historically District Plan insulation standards have sometimes adopted the recommended indoor design decibel sound levels as appropriate performance standards, however this should be resisted by Council for the following reasons;

1) The Building Code adopts minimum acoustic performance standards for indoor noise based on acoustic performance of building elements, tested according to international standards with materials suppliers (and others) quoting the sound transmission qualities for every type of wall cladding, roofing, glazing, etc.. Rather than ask building designers to meet a specified indoor level of sounds from adjacent occupancies, the Building Code requires the walls, roof, etc to meet a minimum transmission loss standard. In this way design noise levels do not have to be estimated by each and every user of the rule and field testing (if required) can be simply undertaken using international standards specifically designed to assist in field testing.
2) We believe Council's have a special duty to consider the "workability" and enforcement matters associated with District Plan rules. This is achieved with a rule based around acoustic rating of the building. This method deals with much of the uncertainty around achieving an indoor decibel level. The recommended method for Council's to follow are those based on ISO 717:2013 The units are either Dtr,2m,NTw + Ctr.
3) "Target" type indoor decibel levels requested by NZTA (for example, a limit of no more than 35 dB in bedrooms and 40 dB in other habitable rooms) are worthy and commendable design aims, however Council's are recommended not to approve such rules for District Plans as they are uncertain in their outcome given the vagaries of traffic forecasting, assumptions by designers etc. let alone the difficulties of attempting to measure compliance in areas affected by sounds other than road traffic. The "Indoor decibel method" makes compliance more difficult to be certain of, especially as there are no specific NZ or international standards governing how to measure indoors against with an indoor performance standard. Thus, these types of rules do not work well for Council's which need District Plan acoustic performance standards that are clear with straight forward field testing using applicable international Standards. This is how the sound transmission requirements of the NZ Building Code are administered, a process Council's are fully familiar with.

Experience has shown the disadvantages of the "indoor decibel" method are;

- External sound level must be predicted each time a new dwelling is designed.
- No design guidance is provided to the rule user in undertaking this noise prediction. This means the user of the rule may conduct noise predictions using uncertain inputs and make assumptions (e.g. regarding road surface) that may not hold true in the future.
- Imposes unnecessary costs and risks for the building designer and owner. Any risks associated with conducting an erroneous noise prediction or under-estimating future traffic flows are borne by the

owner or developer whereas the Agency responsible for roading corridor (and its effects) bears no risks in this regard.

- This "indoor decibel" method has particular disadvantages for council's regarding field testing, if required. There are no NZ standards or international standards specifically designed to assist with such testing. For example, traffic noise testing would require 24 hr testing – on which day should the test be conducted, and how to exclude non-traffic sounds found in the local environment?
- Leads to inconsistent design approaches to deal with outdoor noise with the result new insulated buildings (a) may achieve different required indoor sound levels in areas with the same outdoor noise environment, and (b) due to inadequate design, buildings housing noise sensitive activities may perform poorly in the long run.

The advantages of the ISO method of Rule 17.5.3 are;

- The designer is fully informed of the acoustic performance requirements the building must achieve (in a similar way to dealing with inter-tenancy noise within NZ Building Code procedures).
- The design is easy to check from plans. No traffic noise or rail noise calculations are required.
- Field testing (if necessary) is straight forward using existing international Standards designed for this purpose.
- There is an element of risk sharing as the design target for acoustic performance of the building facade has already been calculated and included in the insulation rule. There are consequently lower risks for the rule user and a greater expectation that the required insulation standard will be achieved compared to the above "indoor decibel" method.
- In 2009 Dr Stephen Chiles URS provided advice to Queenstown District Council regarding acoustic insulation[1]. The report stated *"...The examples .... are either in terms of the performance of the building envelope or a required internal level that should be achieved. In determining an internal level it is necessary to know the external level. We consider that it is better to specify the performance of the building envelope as then no further information is required to comply with the rule".* The ISO method is recommended here for some of the same reasons outlined in the URS report.

Traffic Noise – SH 3 and 4 Whanganui District - Method Of Evaluation

With the assistance of WDC traffic engineers we identified the sections of state highway 3 and 4 that had a post speed limit <70 km/hr. In order to provide a suitable forecast of noise emissions from the highway over the life of the District Plan, an eleven year forecast was taken (to year 2025) based on annual growth of 2% compounding growth for 11 years[2]. Predictions of LAeq(24 hour) traffic noise were based on the NZTA website calculator using 95 km/hr, and the following AADT's and percentage heavy vehicles;

	AADT @ 2025	% Heavy
SH3	5,386	18
	11,320	11
	9,399	15
SH4	1,247	16
	1,480	13

The following graph shows the calculated 24 hour traffic noise levels based on the above AADT and % heavy vehicles, average vehicle speed of 95 km/hr, versus distance from the road.

[1] *Queenstown Town Centre Noise Review*, Report 42168107R002. Prepared for Queenstown Lakes District Council, 29 April 2009.

[2] NZTA requested a 3 dB increase in traffic noise to account for future traffic growth. This is not agreed to. This 3 dB allowance is equivalent to continuous 7% growth p.a. in AADT over 10 years. Such accelerated growth is likely to vastly over-predict vehicle using the highway in the future and therefore noise emissions.

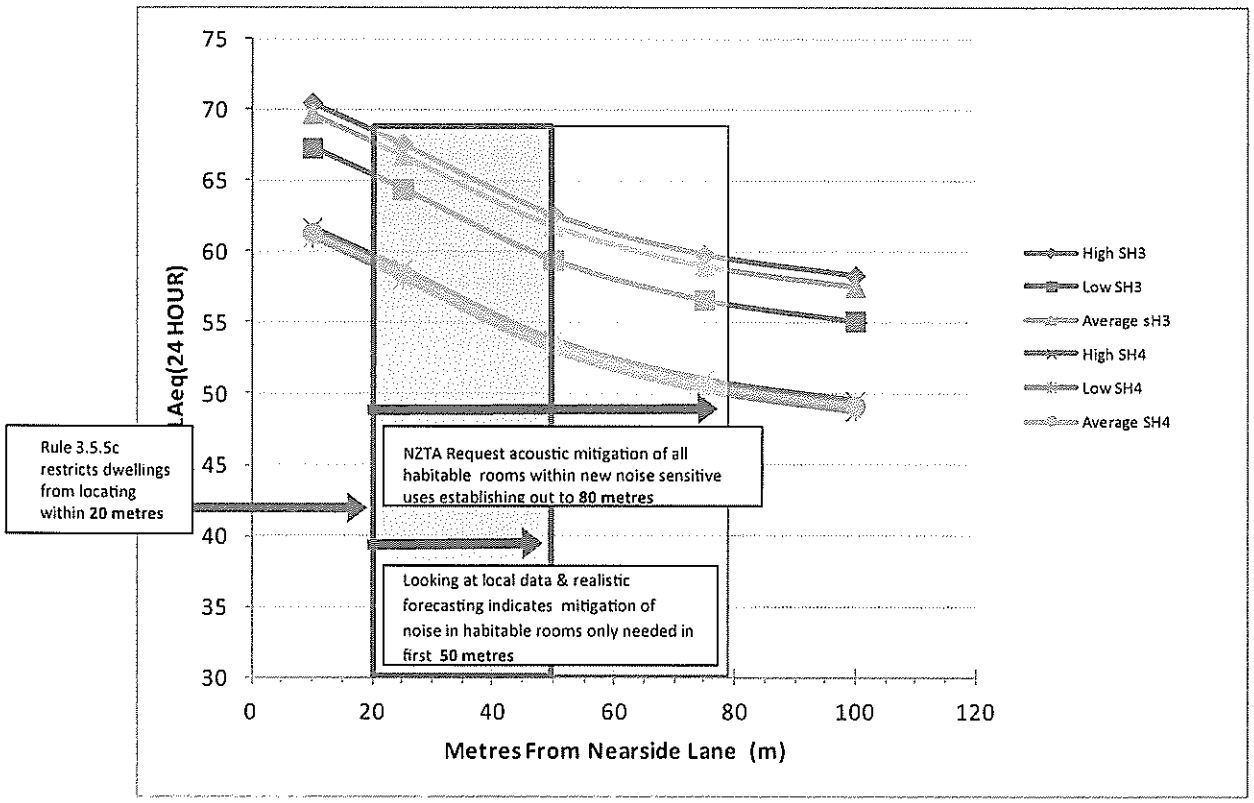


Figure 1 Predicted 24 hour LAeq traffic noise levels as a function of distance from road, 95 km/hr – SH3 and SH 4 AADT forecast for Year 2025.

By examining the expected night time $L_{Aeq(15\ min)}$ outdoor sound levels (being around 10 dB below the $L_{Aeq(24\ hour)}$ level for the same sound) and by taking typical dwelling acoustic performance into account (windows open and windows closed), we have determined traffic noise levels indoors would not exceed LAeq(15 min) 35 dB indoors at night within bedrooms with partially open windows located a distance of 50 metres or greater from the road edge. This is consistent with the recommended indoor sound level in bedrooms near busy traffic routes set out within NZS2107:2000 *Acoustics—Recommended design sound levels and reverberation times for building interiors.*

The District Plan rule (Rule 17.5.3) actually applies to noise sensitive uses establishing within 50 metres as measured from the edge of the designation. This potential extra distance to the actual edge of the highway (i.e. compared to the designation boundary) ensures worst case expected noise effects are taken into account if re-development of the highway takes place resulting in traffic lanes right out to the designation boundary.

Amendments To Rule 17.5.3

As set out attached, we have recommended some wording changes to the District Plan Rule 17.5.3 designed to address reverse sensitivity noise and vibration effects. These changes have arisen from a need to update the acoustic standards to the more recent versions, and to reflect them merits of some aspects of the NZTA appeal and submission on Plan Change 41.

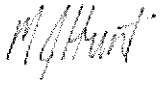
In summary, Rule 17.5.3 has been amended along the following lines;

1. The acoustic treatment (or certification that none is required) is now only prescribed for habitable rooms within 30metres for the designation for parts of date highway 3 where the posted speed limit exceeds 70 km/hr
2. The naming of the acoustic specification has slightly changed as a result of the new technical standards.
3. The new, more up to date technical standards are now referred to.
4. Because new dwellings can be of all types of design and construction, the comparison to the acoustic performance of a new dwelling is not helpful. This comment is recommended to be removed.

5. A new requirement (Rule 17.5.3(b)iii offers the alternative to avoid acoustic insulation where the effects of screening at the rail or roadside or where the shape of the terrain is such that the outdoor sound levels at the outside wall of the proposed dwelling or noise sensitive building do not exceed the stated limit. On this basis that noise levels do not exceed the stipulated level, the level of outdoor sound does not warrant the District Plan requiring acoustic treatment under Rule 17.5.3.
6. Two additional proviso's have been added as per the NZTA appeal request – in order to more clearly signal the requirements for mechanical ventilation (which should be able to operate over a sufficiently broad range and not be noisy in operation). These are sensible technical improvements that will improve the provision of ventilation as part of the acoustic requirements of Rule 17.5.3.

Please do not hesitate to contact the writer is there any further questions.

Yours faithfully,



Malcolm Hunt B.Sc., M.E.(mech), Dip Public Health, RSH Dip Noise Control

	Amendment sought by Appellant	Respondent Response	Recommended Wording;
3.4 Rules – Rural Production Zone Rule 3.5.5 Permitted Activities 3.5.5(c)	*"~~Dwellings~~ The following new structures must~~shall be located at least;~~* *i. in respect of a PPF, be located at least 20 metres from the nearest traffic lane of a state highway where the posted speed is at least 70km/hour, and at least 20 metres of any state highway designation that does not contain an existing state highway.* *ii. in respect of dwellings, be located at least 10 metres from ~~any other side or rear~~ boundary;* *~~iii. 10 metres from any other front boundary.~~"*	**Accept** Accept the term "dwellings" does not fully describe the range of activities sensitive to noise. The term "Protected Premise and Facilities" is a specific term adopted in NZS6806:2010. However the term "Noise Sensitive Activity" is already defined in Wanganui Proposed Plan and suitable for this purpose. Comment: Use term "noise sensitive activity" in place of PPF **Decline** • Use of "PPF" not accepted as it is not needed. • No designations in the district currently that do not contain a State Highway. • Decline removal of "10 metres from any other front boundary" as this is avoids developing noise sensitive activities close to streets and non-state highway roads where noise effects may be significant.	~~Dwellings~~ New Noise Sensitive Activities shall be located at least; i. 20 metres from the nearest traffic lane of a state highway where the posted speed is at least 70km/hour, or at least 10 metres from any other side or rear boundary; ii. 10 metres from any other front boundary.
New Rule to be added as 3.7.9a, 3.9.13a, and 3.11.11a	*"Any new PPF must be located at least 20 metres from the nearest traffic lane for any boundary adjacent to a state highway where the posted speed is at least 70km/hour and at least 20 metres of any State highway designation that does not contain an existing State highway."*	**Accept** • Accept need to maintain a setback to the high speed parts of highway network to avoid adverse noise and vibration effects. **Decline** • Use of "PPF" not accepted as it is not needed. • Do not support the protection of a designation where this does not already include a state highway.	**Recommended Wording;** *"Any new noise sensitive activity must be located at least 20 metres from the nearest traffic lane for any boundary adjacent to a state highway where the posted speed is at least 70km/hour.*

New Rule to be added as Rule 3.5.5g, 3.7.9b, 3.9.13b, and 3.11.11b:	*Within 80 metres of the edge of the nearest traffic lane of any State highway or within 80 metres of any State highway designation that does not contain an existing State highway, any new PPF or any alteration to a PPF beyond 10% of the existing gross floor area, shall be designed and constructed to comply with the following design sound levels:* *i) Road-traffic noise of **35 dB LAeq(24hr):*** *a. in respect of educational buildings, inside all assembly halls, lecture rooms and theatres, and music studios: and* *b. inside all places of worship and marae.* *ll) Road-traffic noise of **40 dB LAeq(24hr):*** *a. in respect of residential buildings, inside all habitable spaces;* *b. in respect of educational buildings, inside all conference rooms, drama studios, sleeping areas, and teaching areas; and* *a in respect of health facilities, inside all wards and sleeping areas; and* *Road-traffic noise of **45 dB LAeq(24h):*** *a. in respect of educational buildings, inside all libraries; and* *b. in respect of health facilities, inside all clinics. consulting rooms, theatres, and nurses' stations.* *If windows must be closed to achieve the design sound levels, the building must be designed, constructed, and maintained with a ventilation and cooling system. For habitable spaces a ventilation and cooling system must achieve the following:*	**Decline** Do not support the proposed wording for following reasons; • Use of PPF is not supported as the Plan already adequately defines sensitive activities to be protected; • The wording used is deficient as the term "PPF" is not needed to classify "noise sensitive activities" to be protected. • Use of "road traffic noise" as a performance standard is a problematic concept given the definitions in this Plan which mean the term "noise" cannot include the sounds of vehicles being driven along a road. • The NZTA approach does not acknowledge reverse sensitivity protection already afforded by the District Plan (especially of critical listening areas and sleeping areas) addressed within **Rule 17.5.3** which provides a basic mechanism designed to manage the effects of traffic noise in areas adjacent to state highways. This is what is being promoted as a District-wide approach for Plan Change 41 which applies within all zones. • NZTA approach conflicts and contrasts with PDP approach to dealing with reverse sensitivity effects adjacent to state highways. Overall, the requested wording is too prescriptive, indoor sound levels being difficult & complex to base compliance on. Compared to the existing District Plan approach whereby the building's minimum acoustic performance is specifically stated (and a type-approval provided for common construction type), the highly variable and not easily predicted future level of traffic noise measured indoors is not a suitable basis for a District Plan acoustic insulation rule. While the general performance standards are agreed to as needed to protect health and well-being (once converted to shorter term average sound levels for day time and night time), however the indoor sound level method for specifying insulation requirements is considered too uncertain and	**Recommended Wording;** *..see amended Rule 17.5.3 attached.*

	iv) Ventilation must be provided to meet Clause G4 of the New Zealand Building Code. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(24h) when measured 1m away from any grille or diffuser. *v) The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.* *vi) The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB LAeq(30s)when measured 1 m away from any grille or diffuser.*	technically bereft to form a viable basis of District Plan building acoustic performance standard. • Compared to acoustic insulation standards that specify the minimum acoustic reduction of buildings, rules based on sound levels received indoors are problematic because; 1) The prediction is fraught with difficulties and inconsistent results are likely between rule users. 2) There are no simple Standards to follow to measure such levels indoors; 3) The measurements take 24 hours minimum per room; 4) It is difficult to exclude non-traffic sounds; • The use of "LAeq(24 hr)" as an indoor indicator of acoustic acceptability is not supported , compared to the ISO method for specifying sound insulation of the building envelope. • The approach sought by NZTA is a 'one size fits all" approach to managing the issue, yet noise levels vary considerably throughout the network. Analysis carried out based around forecast traffic noise levels along the relevant portions state highways in the Whanganui district indicate many areas where additional controls (such as those sought by NZTA) are not needed. Low traffic volumes expected over the life of the District Plan, in many isolated sections of state highway do not require any additional controls promoted by NZTA. • The requirement to address noise up to 80 metres from the state highway has been found to be unnecessary and would be an inefficient method for dealing with reverse sensitivity noise effects. This has been checked by examining future traffic noise following 11 years of growth of the latest 2014 traffic counts. Using forecast AADT's at year 2025 (based on 2 % growth compounding p.a.) and a maximum indoor sound level not exceeding LAeq(15 min) 35 dB at night time in bedrooms, it has been calculated that acoustic treatment	*..see amended Rule 17.5.3 attached.*

		of dwellings (with ventilation also addressed) is only necessary out to a distance of **50 metres** from the designation boundary. This is only needed for those parts of State Highway 3 that are posted with a signed speed limit exceeding 70 km/hr. • By measuring the 50 metre "insulation area" from the designation boundary (as opposed to the edge of the highway itself) an allowance is provided for noise changes due to any road alterations within the designation boundary. Thus, the approach is future-proofed in terms of re-development of the highway closer to the receiver, within the existing designation. • Future traffic noise levels predicted those parts of State Highway 4 (> 70 km/hr speed limit) indicate the 20 metre setback and the basic insulation qualities of a typical dwelling will be sufficient to address noise and vibration reverse sensitivity concerns. • Based on our calculations, rational predictions of future roadside noise levels beyond 50 metres from the edge of the highway do not warrant any additional controls beyond the provisions of district-wide **Rule 17.5.3**. • Given Wanganui's climate, there is no need to provide a cooling function within the ventilation requirements. **Accept** • General concept agreed to ensure the district plan provides adequate noise and vibration reverse protection for state highways. • Accept the following as additions to the ventilation requirements set out within **Rule 17.5.3** on the basis that this enhances the methods for specifying the correct ventilation requirements (including avoiding systems that are noisy when they operate across the required range). Note the amended noise unit for describing sound from the ventilation system, this should be based on a 30 second assessment period, not the 24	*..see amended Rule 17.5.3 attached.*

		hour value requested by NZTA; *iv) Ventilation must be provided to meet Clause G4 of the New Zealand Building Code. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(30 secs) when measured 1m away from any grille or diffuser.* *v) The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.* **Comment** It is proposed to introduce these refinements addressing NZTA concerns via Plan Change 41 as a response to concerns raised by submitters, including NZTA. Apart from adding the above two provisions, it is recommended to amend Rule 17.5.3 in order to improve the degree of acoustic protection in areas where such protection of indoor spaces requires improved protection. The basis of rule 17.5.3 has similar target indoor sound levels as per the NZTA request, but this is translated into a minimum construction standard, accompanied by a ventilation requirement to avoid the need to open windows. A number of NZTA's concerns can be met within the following recommended amendments to Rule 17.5.3 to better account for the concerns raised by NZTA: 1) Increasing the acoustic requirements to 50 metres from the nearside edge of the highway for those parts of State Highway 3 with a >70 km/hr speed limit.	*..see amended Rule 17.5.3 attached.*

		2) Updating the ISO Standards and naming conventions to reflect the latest international standards. 3) Introducing flexibility so that insulation is not required where, due to terrain or site screening, the outdoor sound level is not likely to exceed 55 dB LAeq(24 hr), as determined by an expert report accepted by Council.	
"Acoustic Design Report" requested as part of New Rule to be added as Rule 3.5.5g, 3.7.9b, 3.9.13b, and 3.11.11b:	*Prior to construction, a design report prepared by an acoustics specialist shall be submitted to the District Council to demonstrate compliance with this rule. The design report must take into account the future permitted use of the State highway. For existing roads this must be done by the addition of 3 dB to existing measured or predicted levels.*	**Accept In Part** As above, Council has preferred the approach of **Rule 17.5.3** for dealing with reverse sensitivity to rail and highway noise which is based on the acoustic rating of the external building envelope of habitable rooms to be either conform with the standard construction (specified in Rule 17.6) or via submitting an **Acoustic Design Certificate** to Council. This certificate has a similar function to the requested wording referring to an "acoustic design report". However requiring a report for each dwelling or noise sensitive building is likely to be more costly than simply ensuring the building construction accorded with the guidance provided (which covers typical constructions used in dwellings in NZ). As a result of submissions received from Plan Change 41 and as shown attached, the use of an Acoustic Design Certificate in **Rule 17.5.3** has been expanded (at Rule 17.5.3(b)iii to account for the situation where, due to natural terrain screening or a roadside noise barrier fence, outdoor noise levels are reduced to acceptable levels such that there is no requirement for additional acoustic insulation to be included within the new building. This seems a sensible addition to the reverse sensitivity noise provisions and is, in part, performs a function consistent with the requested "acoustic design report". **Decline In Part** Whereas it is important to allow for the growth in outdoor levels of traffic noise experienced adjacent to highways, this should be based on rational assessment of traffic growth. NZTA states that traffic growth rates should be expressed as arithmetic, not geometric, growth rates. As an example, a 3% arithmetic growth rate will see volumes in 25 years that are 1.75 times greater than the initial volume. A 3% geometric growth would produce volumes 2.09	**Recommended Wording;** *..see amended Rule 17.5.3 attached.*

		times greater, or 20% higher than the arithmetic value. According to NZTA stats the average annual growth in traffic over the last 10 years using the State Highway network for all vehicles is 1.5%. In terms of the Wanganui /Manawatu region, in 1997/98 there were 1,043 million vehicle kilometres travelled with this region. Ten years later this figure had risen to 1,358 million vehicle kilometres. The requested method requiring outdoor noise levels to be calculated from future traffic noise has been rejected above as unsuitable as a basis for assessing acoustic insulation requirements within the District Plan. The addition of +3 dB within the prediction process to account for future traffic growth seems too optimistic as this would allow for a doubling of traffic flows during a typical planning period when in fact history indicates much slower traffic growth rates usually occur in practice. Over-estimating outdoor noise will have the effect of requiring a greater level of insulation, and therefore cost.	

New definitions be added to Chapter 2 for "**Habitable Space**" and "**Protected Premises & Facilities**"	*"Habitable space means: a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water-closet, pantry. walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods.*	**Comment:** The term "habitable Space" is already defined in the District Plan as "*..means any room in a dwelling that is used or that can be used as a sitting room, a living room, a bed room, a dining room or a family room."* This definition only describes the rooms to be protected in dwellings and falls short of including the full range of buildings housing noise-sensitive activities that need to be acoustically protected under Rule 17.5.3. Omissions of note are "marae", "teaching and sleeping rooms in educational facilities" and "rooms used for overnight medical care". These are recommended to be added to ensure the necessary range of rooms protected from outdoor noise. **Accept in Part**: Amended definition to include those "non-dwelling" sensitive rooms that also require acoustic protection.	**Recommended Amendment:** ***Habitable Spaces*** *means any room in a dwelling that is used or that can be used as a sitting room, a living room, a bed room, a dining room or a family room "or rooms used for teaching or sleeping in education facilities, rooms within communal buildings located on marae, and rooms used for overnight care at medical facilities."*

	Protected premises and facilities (PPFs) means: • *Spaces in buildings used for:* • *residential activities* • *marae* • *overnight medical care* • *teaching (and sleeping) in educational facilities* • *playgrounds that are part of educational facilities that are within 20m of buildings used for teaching purposes.* *PPFs are the locations where road-traffic noise is assessed and for which noise mitigation measures may be required."*	**Comment:** The District Plan methods for addressing reverse sensitivity noise and vibration effects associated with the operation of the state highway do not realistically need to refer to such noise sensitive activities and locations as per the term "PPF". This term derives from NZS6806:2010 *Acoustics – Traffic Noise – Noise From New & Altered Roads* which is a Standard referred to within the District Plan. It is recommended the term PPF only be adopted for use in the District Plan if or where the provisions refer to assessing effects of noise from new or altered roads. This is a separate consideration to the issues raised by NZTA which relate to methods for dealing with reverse sensitivity noise and vibration effects on land adjacent to state highways.	**No amendments recommended.**

Proposed Amendments to Rule 17.5.3

(New Text = underlined, Deleted Text = ~~strikeout~~). These updates reflect the fore-going comments and recommendations made with respect to submissions received on Plan Change 41 and in response to issues raised within the NZTA Appeal. Changes have also been made to ensure the most up to date technical standards are referred to.

17.5.3 Noise Sensitive Activities (including dwellings).

New or relocated buildings for a noise sensitive activity on any site within any rural, commercial or industrial zones (excluding the Airport Enterprise Zone) ~~or~~ within 30 metres of a railway designation or within 50 metres of any portion of the state highway 3 designation to which with a signed speed limit exceeding 70 km/hr applies shall comply with the following:

a. Any habitable space within a new or altered building shall be designed to achieve an insulation rating of no less than:

~~DnT,w+ Ctr > 30 dB~~ $D_{2m,nT,w}$ + Cr > 30 dB

The update to this formula is as a result of the updated Standards and represents accepted best practice in this area. It has not changed the insulation standard required.

for the external building envelope of each habitable room when tested and verified in accordance with the following standards:

i. ~~AS/NZS1276.1:1999 Acoustics- Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation~~. AS/NZS ISO 717.1:2013 *Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation*

ii. ~~ISO 140-5:1998 Acoustics -- Measurement of Sound Insulation in Buildings and of Building Elements Part 5: Field Measurements of Airborne Sound Insulation of Façade Elements and Facades.~~ ISO 16283-1:2014 *Acoustics -- Field measurement of sound insulation in buildings and of building elements -- Part 1: Airborne sound insulation*

b. Compliance with this performance standard shall be achieved when the design and construction of each habitable room:

i. accords with the exact construction specification and schedule as set out in 17.6.

~~Note: A new dwelling constructed to the Building Code will comply with this performance standard.~~

or

ii. an acoustic design certificate is provided to Council by a suitably qualified and experienced acoustic expert (suitable to Council) which confirms that when built to the recommended design and specification will achieve the minimum acoustic insulation standard of ~~DnT,w+ Ctr > 30 dB~~ $D_{2m,nT,w}$ + Cr > 30 dB for the external building envelope of each habitable room.

or

iii. providing an acoustic design certificate prepared by an acoustic expert acceptable to Council stating the outdoor noise level at the most affected exterior of the building containing the habitable room will be unlikely to exceed:

55 dB $L_{Aeq(1hr)}$ for rail traffic noise

57 dB $L_{Aeq(24hr)}$ for road traffic noise

c. If the above standard cannot be met with open-able doors and windows then:

i. Mechanical air ventilation shall be required in accordance with provisions of the New Zealand Building Code G4- Ventilation.

ii. At the same time as meeting this requirement, the sound of the system must not exceed 30 dB LAeq(30 secs) when measured 1m away from any grille or diffuser.

iii. The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser.

[End of Document]

Rachael Pull

From: Malcolm Hunt <mha@noise.co.nz>
Sent: Wednesday, 30 September 2015 12:42 p.m.
To: Rachael Pull
Subject: Re: FW: Further information for PC41
Attachments: W002 Report July 20061.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Rachael,
Thanks for that. **Please see my responses in blue below each question**;

At 02:25 p.m. 29/09/2015, you wrote:

> Good afternoon
>
> I have started drafting the hearing reports for the noise plan change and have come across a couple more gaps in my knowledge. Can you please answer the following:
>
> **7.4 Submitter Name: MidCentral Public Health Services**
> **Submission No: 17.3pc41**
> Summary:
> Support the assessment methods for mining explosives (Rule 17.5.4), but requests minor changes to the terminology.
> Decision Sought:
> 1. ?128 unweighted BZ? is replaced with ?128 dB?.
> **Accept- this is technically correct**
> 2. ?blast noise (air blast)? is replaced with ?blast vibration?.
> **Accept in part - Agree with substitution for 15.5.4(a) but not in (b)**
> QUESTION: Is this correct?
>
> **7.6 Submitter Name: MidCentral Public Health Services**
> **Submission No: 17.5pc41**
> Summary:
> Supportive of the gist of the provisions of Rules 17.5.7-10 (Noise controls for zones), but requests amendments in order with case law and clarity for Plan users
> Decision Sought:
> 1. Rule 17.5.7(a) (Rural zone limits) is retained, but with minor amendments to the terminology.
> 2. Rule 17.5.7(b-c) (bird scaring devices) is retained.
>
> 3. Rule 17.5.8-10 (zone limits) is retained, but with minor amendments to the terminology.

Agree with all those requested changes

> QUESTION: Is the terminology changes requested correct? (See attached submission for full details)
> **7.9 Submitter Name: New Zealand Transport Agency**

Submission No: 24.1pc41

Summary:

Supportive of the intention to protect noise sensitive activities from the transport network. The Transport Agency recommends a provision that specifies the internal noise level instead of how the building performs as it relates more closely to the effect that is anticipated to be avoided and it ensures each building is appropriately designed in relation to its distance for the State Highway network.

Decision Sought:

Amend Rule 17.5.3 to restrict noise sensitive activities within 20 metres of the state highway and to require noise sensitive activities within 80 metres of the state highway to have an internal noise level of 40 dB LAeq(24hr) or habitable spaces and no greater than the maximum limits in AS/NZS 2107:2000.

This is linked to NZTA's appeal of PC 36 - See Brenda about this - we don't agree with NZTA methodology but do agree to the general thrust of protecting sensitive indoor spaces to the sorts of indoor Stds they refer, however as a Council we prefer methods based on acoustic rating of the building envelope. This is similar to how Council deals with inter-tenancy noise and other building performance matters. NZTA's approach does not suit rule users or Councils' but will fully achieve NZTA's policy objectives (at no cost) - for these reasons we also view the NZTA approach inequitable.

QUESTION: Do you have an idea/estimate of how much our proposed provisions would add to a cost of a standard house? The table below is what I want to say in my report:

The additional cost of upgrading a new single story 3 bedroom house (excluding GST) to comply with these standards are:

At 60 m and 90m NO special acoustic treatment to deal with highway noise.

I attach a Wellington City report on costs which unfortunately don't fully align with the table you've used. It still has some relevance for cost estimation.

I also understood that this standard would be meet by the current building code. However you have taken out this comment. How much more onerous is this standard on the user?

Testing has shown typical new dwelling will achieve DnTw+Ctr < 28
Typical a new house only has to be marginally improved to meet > 30
Some new houses of solid construction with double glazing can achieve DnTw+Ctr > 35

7.14 **Submitter Name: KiwiRail Holdings Limited (KiwiRail)**

Submission No: 25.4pc41

Officer Comments

The concern about a ?suitably qualified acoustic engineer? can be altered to a

a. Professional body?
b. Set level of degree?

c. List of approved consultants?
QUESTION: Is there a professional body or qualification we can refer to without needing a peer review each and every time?
**The NZ Acoustical Society has devised a system based on expertise & qualifications. The term "Member ASNZ" is intended to be used to identify those persons holding suitable experience and qualifications. The NZS website states "*The phrase "suitably qualified acoustic engineer" is commonly used in NZ legislation relating to environmental noise and building acoustics. The Members Register is the full list of current ASNZ Members and is the only definitive record of suitably qualified acoustic engineers in New Zealand.*
*ASNZ does not publish the Members Register, but interested parties can submit an enquiry to determine whether a person is an ASNZ Member, thereby confirming that person meets the minimum qualification and experience requirements."***

7.17 **Submitter Name: New Zealand Defence Force**
Submission No: 28.1pc41
Summary:
Opposed to the following parts of the proposed Plan change:
1. The definition of noise is broad and does not provide any practical use in terms of the application of the Plan provisions.

2. The vibration performance standards are not appropriate for a permitted activity as it is subjective and not easily quantifiable. NZDF considers such a standard unworkable.
Decision Sought:
1. Remove the proposed definition of noise and exclude the listed activities from the relevant rules.
The propsoed defintion of "noise" is important as it excludes sources not covered by the relevant NZ Stds. The notified definition should be retained - I recommend to decline NZDF this submission point.
2. Amend the proposed performance standard for vibration to refer to the appropriate standard.

There are no relevant New Zealand Standards to assess vibration effects, therefore the issue is proposed to be dealt under the nuisance provisions of the Health Act 1956 or as an adverse effect that there is a duty to manage under section 17 of the RMA. Our earlier advie to Brenda was to retain the reference to avoid vibration effects in the polciies and objectives, but to remove the vibration rule. The Std referred to previously as a "guide' has been superceded by a new Std with no specific guidance on adverse vibration effects (measurement only). This is the thinking in some other district plans.

QUESTION: What do we need to do to the vibration provisions to make them work?

Thanks

Rachael.

[1] NZ Transport Agency Building Treatment Costing Study December 2013

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Wellington

Please Visit: www.noise.co.nz
Office [04] 472 5689

Rider Hunt

ELEMENTAL ESTIMATED COST REPORT

FOR

PORT-NOISE ACOUSTIC DESIGN REQUIREMENTS (30dBA And 35dBA)

FOR

WELLINGTON CITY COUNCIL

July 2006

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Report Prepared by

Vaughan Plant

.....

Report Reviewed by

Hugh Mackenzie

GENERAL

• Introduction

This Elemental Estimate is for comparative purposes to provide an indicative assessment of the typical impact of acoustic design changes applicable to the Port-noise Affected Area.

This report is based on estimated typical costs for two types of 'Model' apartments and a 'Model' Villa retrofit/extension using the acoustic design schedule for "standard" construction, 30dBA construction and 35dBA construction as prepared by Malcolm Hunt Associates Acoustic Engineers. The 'Model' dwelling costs include allowance for structural components, walls, ceilings, windows, fixtures/fittings, services and elements directly affected by the District Plan changes.

Please note that the estimate is intended to provide comparative construction cost data only and is not intended as a complete construction cost estimate.

This report does not incorporate the possible secondary economic effects of the proposed changes. However it should be noted that some secondary economic advantage may result from the proposed acoustic upgrades, for example, improved thermal insulation properties, perceived market increase in quality of upgraded local building stock, etc.

• Summary

The outcome of our comparative estimate analysis for 30dBA and 35dBA construction upgrades is reported in the following tables on a percentage of cost increase basis for each 'Model' dwelling unit.

30dBA Acoustic Requirement Summary

Description of 'Model'	Standard Current Cost "A"	30dBA Upgraded Cost "B"	Change "C"	% Cost Increase for Proposed 30dBA Acoustic Changes "C/A"
'Model 1' Bedroom Mid-floor apartment	$84,000	$85,500	$1,500	1.8%
'Model 2' bedroom Penthouse apartment	$144,900	$153,000	$8,100	5.6%
'Model' Villa Retrofit 1 Bedroom Extension with Ensuite	$63,300	$71,000	$7,700	12.2%

35dBA Acoustic Requirement Summary

Description of 'Model'	Standard Current Cost "A"	35dBA Upgraded Cost "B"	Change "C"	% Cost Increase for Proposed 35dBA Acoustic Changes "C/A"
'Model 1' Bedroom Mid-floor apartment	$84,000	$88,000	$4,000	4.8%
'Model 2' bedroom Penthouse apartment	$144,900	$168,300	$23,400	16.1%
'Model' Villa Retrofit 1 Bedroom Extension with Ensuite	$63,300	$80,100	$16,800	26.5%

The 'Model' apartments (both 1 and 2 bedroom) are based on the cost of the unit within a multilevel development including proportional allowance for structural components of the building as a whole.

The 'Model' Villa retrofit costs are derived from the cost of the proposed 43m2 extension only and not the entire dwelling. This approach is in accordance with requirements to upgrade altered areas of an existing dwelling only however the percentage cost increase is proportionately higher than for a complete new dwelling unit.

The report is based on 'Model' dwelling units as representative of typical construction and specification in the Central Wellington area. The analysis should be treated as an indicative guide only based upon the parameters outlined in the Malcolm Hunt Associates construction schedules. It is recommended specific acoustic design and costs estimates should be undertaken to ascertain construction costs for individual projects.

Note all analysis is exclusive of GST.

PRELIMINARY ELEMENTAL ESTIMATE

- **Basis of Estimate**

This estimate is an elemental estimate of construction costs and is based on measured approximate quantities of the 'Model' dwellings and priced rates as at July 2006 and makes no allowance for cost escalation beyond July 2006.

This estimate assumes the work will be let as one single contract and all trades will be competitively tendered.

- **'Model' 1 Bedroom Mid-floor Apartment**

One bedroom apartment, approximately 50m2 GFA in a mid-level strata of a new centrally located multi-storey apartment building.

The apartment has approximately 18m2 of external façade (14m2 precast concrete panel & 4m2 of windows), one partitioned off bedroom and a single bathroom. To provide realistic overall comparative cost analysis the estimate also includes for an allowance for the building structural components.

Living rooms/lounge areas although classed as habitable have not been deemed to require additional separate mechanical fresh air supply.

Refer appendix 2 for full details of the 'Model' apartment estimate and the proposed upgraded 'Model' apartment.

- **'Model' 2 Bedroom Penthouse Apartment**

Two bedroom rooftop penthouse apartment, approximately 70m2 GFA in a new centrally located multi-storey apartment building.

The apartment has approximately 109m2 of external façade (82m2 cement sheet type cladding & 27m2 of windows), two partitioned off bedrooms and a single bathroom. To provide realistic overall comparative cost analysis the estimate also includes for an allowance for the building structural components.

Living rooms/lounge areas although classed as habitable have not been deemed to require additional separate mechanical fresh air supply.

Refer appendix 3 for full details of the 'Model' apartment estimate and the proposed upgraded 'Model' apartment.

- **'Model' Villa Retrofit With Habitable Room Extension + Ensuite**

New one bedroom extension with associated ensuite to an existing 'Villa' type dwelling, approximately 43m2 GFA total new extension. **Note only the new extension is deemed to require upgrades to meet proposed acoustic changes.**

The new extension has approximately 58m2 of external façade (42m2 weatherboard type cladding & 16m2 of windows), one partitioned off bedroom and a single ensuite/bathroom. To provide realistic overall comparative cost analysis the estimate also includes for an allowance for the building structural components.

Refer appendix 4 for full details of the 'Model' Villa estimate and the proposed upgraded 'Model' Villa extension.

• Documentation

The estimate has been based on the following information: -

- Malcolm Hunt Associates 'Model' Dwelling Construction Schedule

• Estimate Exclusions

No allowances have been made for the following: -

- Escalation in costs beyond July 2006
- Building & Resource Consent fees
- Land acquisition costs
- Goods and Services Tax (G.S.T)
- Professional Fees
- Legal Costs
- Secondary economic effects

• Appendicis

Refer to the following pages.

APPENDIX 1

Malcolm Hunt Associates

'Model' Dwelling Construction Schedule

Rw+Ctr >35 Schedule *Minimun Critieria Rw+Ct > 35*	Rw	Ctr	Rw+Ctr
Notes: All linings hard/solid fixed to timber frame. Standard R2.2 batts in wall/ceiling cavity. Rw 50-3150Hz (Rw+ctr generally 2 points lower for 50 to 5000Hz). Predictions generally within 1-3 dB of real life construction for most. All internal doors solid core with full perimeter seals. Windows perimeter sealed.			
Window Glazing			
7mm Laminate [orginal]	34	-4	30
8.38 Laminate	35	-4	31
8.76 Laminate	35	-3	32
9mm Laminated Glass	35	-3	32
10.38 Laminate	36	-3	33
10.76 Laminate	36	-3	33
11mm Laminated Glass	37	-4	33
12.38 Laminate	37	-3	34
12.76 Laminate	37	-3	34
17mm Laminated Glass	39	-3	36
External Wall Construction [HardiFlex Compressed Sheet]			
6 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 13 mm Gib [orginal]	41	-8	33
6 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 13 mm Gib	42	-7	35
7.5 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 13 mm Gib	41	-7	34
7.5 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 13 mm Gib	42	-6	36
6 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x10 mm Gib	44	-8	36
6 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x10 mm Gib	45	-6	39
6 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	45	-6	39
6 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	46	-5	41
7.5 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	45	-6	39
7.5 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	46	-5	41
6 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 1x10mm + 1x13 mm Gib	45	-7	38
6 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 1x10mm + 1x13 mm Gib	46	-6	40
7.5 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 1x10mm + 1x13 mm Gib	45	-7	38
7.5 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 1x10mm + 1x13 mm Gib	46	-5	41
6 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	45	-6	39
6 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	46	-5	41
7.5 mm Harditex, 100 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	45	-6	39
7.5 mm Harditex, 150 mm x 50 mm framing, R2.2 batts in cavity, lined with Standard 2x13 mm Gib	46	-5	41
External Wall Construction Type 2 [Timber Weatherboard]			
25 mm timber weatherboard over 100x50mm framing, 13 mm standard gib, R2.2 batts in cavity [orginal]	39	-8	31
25 mm weatherboard over 100x50mm framing, 2x10 mm standard gib, R2.2 batts in cavity	43	-9	34
25 mm weatherboard over 150x50mm framing, 2x10 mm standard gib, R2.2 batts in cavity	44	-7	37
25 mm weatherboard over 100x50mm framing, 2x13 mm standard gib, R2.2 batts in cavity	44	-7	37
25 mm weatherboard over 150x50mm framing, 2x13 mm standard gib, R2.2 batts in cavity	45	-6	39
25 mm weatherboard over 100x50mm framing, 1x10mm + 1x13 mm standard gib, R2.2 batts in cavity	44	-8	36
25 mm weatherboard over 150x50mm framing, 1x10mm + 1x13 mm standard gib, R2.2 batts in cavity	44	-6	38
25 mm weatherboard over 100x50mm framing, 2x13 mm gib noistine, R2.2 batts in cavity	47	-7	40
25 mm weatherboard over 150x50mm framing, 2x13 mm gib noistine, R2.2 batts in cavity	47	-5	42
External Roof/Ceiling Lining Construction			
0.55 profiled roofing iron, over building paper, over 200 mm airgap, 450m joists. Internal lined with standard 13 mm Gib. R2.2 Batts in cavity. Soffits (200 mm wide) - 4 mm Harditex [orginal]	42	-7	35
0.55 profiled roofing iron, over building paper, over 250 mm airgap, 450m joists. Internal lined with standard 2x13 mm Gib. R2.2 Batts in cavity. Soffits (200 mm wide) - 4 mm Harditex	48	-7	41

Apartment 1

Element	"Typical" Construction.	Construction Schedule	Area (m2)	Total Area (m2)
Window 1	Standard 4mm thick Clear Float	7mm Laminated Glass	3	
Window 2	Standard 4mm thick Clear Float	7mm Laminated Glass	1.2	
			Total Window Area	**4.2**
External Wall Façade 1:	150 mm concrete, lined with Standard 10 mm Gib	150 mm concrete, lined with Standard 10 mm Gib	14.4	
Door	Hollow-core	Std solid core door PLUS allow weather-strip.		
			Total Wall Façade Area	**14.4**

Notes: Difference between Schedule and Typical Construction is 4mm clear float and 7mm laminated glass respectively. All remaining construction elements are the same.

Apartment 2

Element	"Typical" Construction.	Construction Schedule	Area (m2)	Total Area
Window 1	Standard 6mm thick Clear Float	7mm Laminated Glass	6.6	
Window 2	Standard 4mm thick Clear Float	7mm Laminated Glass	1.2	
Window 3	Standard 4mm thick Clear Float	7mm Laminated Glass	1.2	
Window 4	Standard 4mm thick Clear Float	7mm Laminated Glass	0.6	
Window 5	Standard 4mm thick Clear Float	7mm Laminated Glass	0.36	
Window 6	Standard 6mm thick Clear Float	7mm Laminated Glass	16.8	
			Total Window Area	**26.76**
External Wall Façade 1:	6 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 10 mm Gib.	6 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 13 mm Gib.	16.8	
External Wall Façade 2:	6 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 10 mm Gib.	7 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 13 mm Gib.	16.8	
External Wall Façade 3:	6 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 10 mm Gib.	8 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 13 mm Gib.	24	
External Wall Façade 4:	6 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 10 mm Gib.	9 mm Harditex, 100 mm x 50 mm framing, R1.8 batts in cavity, lined with Standard 13 mm Gib.	24	
			Total Wall Façade	**81.6**
Roof Ceiling / Ceiling Construction	0.55 profiled roofing iron, over building paper, over 200 mm joists, lined with 10 mm Gib. R2.2 Batts in cavity. Soffits (200 mm wide) - 4 mm Harditex	0.55 profiled roofing iron, over building paper, over 200 mm joists, lined with 13 mm Gib. R2.2 Batts in cavity. Soffits (200 mm wide) - 4 mm Harditex	70	
			Total Roof Area	**70**

PLUS allow additional weather-strip to seal to sliding door.

Notes: Difference between Schedule and Typical Construction is 6mm clear float and 7mm laminated glass, and gib linings from 10 mm to 13 mm. All remaining construction elements are the same.

House retrofit 3

Element	"Typical" Construction.	Construction Schedule	Area (m2)	
Window 1	Standard 4mm thick Clear Float	7mm Laminated Glass	3.3	
Window 2	Standard 4mm thick Clear Float	7mm Laminated Glass	12.2	
			Total Window Area	15.5
External Wall Façade 1:	Pallisade over 100 mm studs, 13 m m gib linings	Pallisade over 100 mm studs, 10 m m gib linings		
External Wall Façade 2:	25 mm weatherboard over 100mm studs, 13 mm gib	26 mm weatherboard over 100mm studs, 10 mm gib		
			Total Wall Façade Area	42
Roof Ceiling / Ceiling Construction				
	0.55 profiled roofing iron, over building paper, over 200 mm joists, lined with 10 mm Gib. R2.2 Batts in cavity. Soffits (200 mm wide) - 4 mm Harditex		32.5	
Skylight	Laserlite polycarbonate, 250 mm air gap, 4 mm clear float	Proprietary glazing, 7 mm laminated glass	10	
			Total Roof Area	42.5

Notes: Difference between Schedule and Typical Construction is windows, claddings and skylight. All remaining construction elements are the same.

APPENDIX 2

'Model' Building Estimate Details

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

SUMMARY 30dBA

Description	Standard Current Cost "A"	30 dBA Upgraded Cost "B"	Change "C"	% Change "C/A"
Model 1 Bedroom Mid-floor apartment	84000	85500	1500	1.8%
Model 2 Bedroom Penthouse apartment	144900	153000	8100	5.6%
Model 'Villa' Retrofit & 1 Bedroom Extension	63300	71000	7700	12.2%

SUMMARY 35dBA

Description	Standard Current Cost "A"	35dBA Upgraded Cost "B"	Change "C"	% Change "C/A"
Model 1 Bedroom Mid-floor apartment	84000	88000	4000	4.8%
Model 2 Bedroom Penthouse apartment	144900	168300	23400	16.1%
Model 'Villa' Retrofit & 1 Bedroom Extension	63300	80100	16800	26.5%

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	50	600	30000
EW	**EXTERNAL WALLS**				
1	150mm concrete wall with 10mm gib internally	m2	14	340	4760
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic alumnium framed 4mm clear float glass	m2	4	300	1200
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
2	Double leaf sliding wardrobe door	No	1	500	500
3	Single cupboard door	no	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	50	105	5250
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	42	42	1764
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	50	65	3250
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			5500
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	item			150
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for amenities mechanical extracts	item			2200

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	50	38	1900
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	50	70	3500
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			300
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			6241
				TOTAL	**$ 84,000**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (PROPOSED REQUIREMENTS 30 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	50	600	30000
EW	**EXTERNAL WALLS**				
1	150mm concrete wall with 10mm gib internally	m2	14	340	4760
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 7mm laminated glass	m2	4	370	1480
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
2	Double leaf sliding wardrobe door	No	1	500	500
3	Single cupboard door	no	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	50	105	5250
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	42	42	1764
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	50	65	3250
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			5500
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	item			150
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (PROPOSED REQUIREMENTS 30 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
1	Allowance for amenities mechanical extracts	item			2200
2	Allowance for fresh air supply to bedroom 1	item			1100
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	50	38	1900
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	50	70	3500
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			300
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			6361
				TOTAL	**$ 85,500**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (PROPOSED REQUIREMENTS 35 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	50	600	30000
EW	**EXTERNAL WALLS**				
1	150mm concrete wall with 10mm gib internally	m2	14	340	4760
WW	**WINDOWS & EXTERIOR DOORS**				
1	Aluminium framed 12.76mm laminated glass	m2	4	570	2280
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
2	Double leaf sliding wardrobe door	No	1	500	500
3	Single cupboard door	no	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	50	105	5250
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	42	42	1764
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	50	65	3250
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			5500
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	item			150
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

1 BED APARTMENT FITOUT (PROPOSED REQUIREMENTS 35 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
1	Allowance for amenities mechanical extracts	item			2200
2	Allowance for fresh air supply to bedroom 1 (35dba)	item			2500
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	50	38	1900
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	50	70	3500
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			400
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			6561
				TOTAL	**$ 88,000**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

2 BED PENTHOUSE APARTMENT FITOUT (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	70	600	42000
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 200mm joists, R2.2 batts, 10mm gib	m2	70	200	14000
2	200mm wide 4mm Harditex soffit	m2	6	120	720
EW	**EXTERNAL WALLS**				
1	6mm Harditex, timber frame, batts, 10mm gib	m2	82	220	18040
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 4mm float glass	m2	4	300	1200
1	Domestic aluminium framed 6mm float glass	m2	23	330	7590
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	3	700	2100
3	Double leaf sliding wardrobe door	No	2	500	1000
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	60	105	6300
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	58	42	2436
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	8	120	960
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	70	65	4550
2	EV for special entry ceiling	m2	5	60	300
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			7000
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

2 BED PENTHOUSE APARTMENT FITOUT (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for amenities mechanical extracts	item			2200
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	70	38	2660
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	70	70	4900
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			300
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			10739
				TOTAL	**$ 144,900**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

2 BED PENTHOUSE APARTMENT FITOUT (PROPOSED REQUIREMENTS 30 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	70	600	42000
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 15mm ply sarking 200mm joists, R2.2 batts, 10mm gib	m2	70	250	17500
2	200mm wide 4mm Harditex soffit	m2	6	120	720
EW	**EXTERNAL WALLS**				
1	6mm Harditex, timber frame, batts, 13mm gib	m2	82	225	18450
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 7mm laminated glass	m2	27	370	9990
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	3	700	2100
3	Double leaf sliding wardrobe door	No	2	500	1000
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	60	105	6300
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	58	42	2436
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	8	120	960
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	70	65	4550
2	EV for special entry ceiling	m2	5	60	300
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			7000
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

2 BED PENTHOUSE APARTMENT FITOUT (PROPOSED REQUIREMENTS 30 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
4	WHB complete	no	1	1600	1600
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for amenities mechanical extracts	item			2200
2	Allowance for fresh air supply to bedroom 1	item			1100
3	Allowance for fresh air supply to bedroom 2	item			1100
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	70	38	2660
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	70	70	4900
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			500
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			11329

TOTAL $ 153,000

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS **Rider Hunt**

2 BED PENTHOUSE APARTMENT FITOUT (PROPOSED REQUIREMENTS 35 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
ST	**STRUCTURAL ELEMENTS**				
1	Substructure, frame & upper floors	m2	70	600	42000
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 15mm ply sarking 250mm joists, R2.2 batts, 2x13mm gib	m2	70	270	18900
2	200mm wide 4mm Harditex soffit	m2	6	120	720
EW	**EXTERNAL WALLS**				
1	7.5mm Hardiflex, 150x50mm timber frame, batts, 1x10mm gib 1x13mm gib	m2	82	280	22960
WW	**WINDOWS & EXTERIOR DOORS**				
1	Aluminium framed 12.76mm laminated glass	m2	27	570	15390
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	3	700	2100
3	Double leaf sliding wardrobe door	No	2	500	1000
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	60	105	6300
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	58	42	2436
2	Floor finishes to bathroom	m2	4	120	480
3	Floor finishes to kitchen/entry	m2	8	120	960
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	70	65	4550
2	EV for special entry ceiling	m2	5	60	300
FT	**FITTINGS AND FIXTURES**				
1	Allowance for kitchen joinery	item			7000
2	Allow for appliances - hob/oven/range hood	item			1400
3	Vanity unit	no	1	1000	1000
4	Breakfast bar	no	1	750	750
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
7	Sundry shelving to HWC etc	item			200
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

2 BED PENTHOUSE APARTMENT FITOUT (PROPOSED REQUIREMENTS 35 dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600
5	Plumbing to kitchen fittings/appliances	item			900
6	Plumbing to laundry fittings/appliances	item			800
7	Hot water cylinder	no	1	1200	1200
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for amenities mechanical extracts	item			2200
2	Allowance for fresh air supply to bedroom 1 (35 dBA)	item			2500
3	Allowance for fresh air supply to bedroom 2 (35dBA)	item			2500
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	70	38	2660
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	70	70	4900
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			250
2	Security & entry phone system	item			400
SU	**SUNDRIES**				
1	Builders work to services	item			500
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			12519

TOTAL $ 168,300

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
SB	**SUBSTRUCTURE**				
1	Partical board floor on timber piles & subframe	m2	43	180	7740
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 200mm joists, R2.2 batts, 10mm gib	m2	33	200	6600
2	Laserlite polycarb, 250mm airgap, 4mm float glass skylight complete	m2	10	500	5000
3	200mm wide 4mm Harditex soffit	m2	4	120	480
EW	**EXTERNAL WALLS**				
1	Pallisade, 100mm framing, R1.8 batts, 10mm gib	m2	21	210	4410
2	25mm Weatherboard, 100mm framing, R1.8 batts, 10mm gib	m2	21	260	5460
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 4mm float glass	m2	16	300	4800
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
3	Double leaf sliding wardrobe door	No	1	500	500
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	35	105	3675
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	39	42	1638
2	Floor finishes to bathroom	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	43	65	2795
FT	**FITTINGS AND FIXTURES**				
3	Vanity unit	no	1	1000	1000
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for mechanical extracts to ensuite	item			1100

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE (CURRENT REQUIREMENTS)

		Unit	Qty	Rate	$
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	37	0	0
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	37	70	2590
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			150
SU	**SUNDRIES**				
1	Builders work to services	item			200
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			4757
				TOTAL	**$ 63,300**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE
(PROPOSED REQUIREMENTS 30dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
SB	**SUBSTRUCTURE**				
1	Partical board floor on timber piles & subframe, 15mm ply sarking to underside joists	m2	43	230	9890
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 15mm ply sarking, 200mm joists, R2.2 batts, 10mm gib	m2	33	250	8250
2	Proprietary 7mm laminated glass skylight	m2	10	600	6000
3	200mm wide 4mm Harditex soffit	m2	4	120	480
EW	**EXTERNAL WALLS**				
1	Pallisade, 100mm framing, R1.8 batts, 13mm gib	m2	21	215	4515
2	25mm Weatherboard, 100mm framing, R1.8 batts, 13mm gib	m2	21	265	5565
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 7mm laminated glass	m2	16	370	5920
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
3	Double leaf sliding wardrobe door	No	1	500	500
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	35	105	3675
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	39	42	1638
2	Floor finishes to bathroom	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	43	65	2795
FT	**FITTINGS AND FIXTURES**				
3	Vanity unit	no	1	1000	1000
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE
(PROPOSED REQUIREMENTS 30dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for mechanical extracts to ensuite	item			1100
2	Allowance for fresh air supply to bedroom 1	item			1100
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	37	0	0
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	37	70	2590
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			150
SU	**SUNDRIES**				
1	Builders work to services	item			200
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			5227
				TOTAL	**$ 71,000**

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE
(PROPOSED REQUIREMENTS 35dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
SB	**SUBSTRUCTURE**				
1	Partical board floor on timber piles & subframe, 15mm ply sarking to underside joists	m2	43	230	9890
RF	**ROOFING**				
1	0.55 Profiled roofing iron, 15mm ply sarking, 250mm joists, R2.2 batts, 2x13mm gib	m2	33	275	9075
2	Proprietary 12.76mm laminated glass skylight	m2	10	750	7500
3	200mm wide 4mm Harditex soffit	m2	4	120	480
EW	**EXTERNAL WALLS**				
1	Pallisade, 150mm framing, R1.8 batts, 2x13mm gib	m2	21	250	5250
2	25mm Weatherboard, 150mm framing, R1.8 batts, 2x13mm gib	m2	21	300	6300
WW	**WINDOWS & EXTERIOR DOORS**				
1	Domestic aluminium framed 7mm laminated glass	m2	16	570	9120
DR	**INTERIOR DOORS**				
1	Single solid core door incl hardware	No	2	700	1400
3	Double leaf sliding wardrobe door	No	1	500	500
4	Single cupboard door	No	1	375	375
PN	**INTERIOR WALLS**				
1	Full height timber partition	m2	35	105	3675
2	Glass screen to bath/shower	no	1	950	950
FF	**FLOOR FINISHES**				
1	Floor finishes to living & bedroom	m2	39	42	1638
2	Floor finishes to bathroom	m2	4	120	480
WF	**WALL FINISHES**				
1	EV for wet area wall finishes	m2	10	105	1050
CF	**CEILING FINISHES**				
1	Timber framed gib lined ceiling	m2	43	65	2795
FT	**FITTINGS AND FIXTURES**				
3	Vanity unit	no	1	1000	1000
5	Wardrobe rail/shelving	no	2	150	300
6	Sundry toilet hardware	item			50
8	Allowance for mirrors	item			200
PB	**SANITARY PLUMBING**				
1	Bath complete	no	1	1800	1800
2	Shower mixer, rose & rail (over-bath)	no	1	600	600
3	WC suite complete	no	1	1600	1600
4	WHB complete	no	1	1600	1600

PORT NOISE ACOUSTIC DESIGN REQUIREMENTS

Rider Hunt

VILLA' RETROFIT HABITABLE ROOM EXTENSION + ENSUITE
(PROPOSED REQUIREMENTS 35dBA)

PROPOSED CHANGES SHOWN SHADED

		Unit	Qty	Rate	$
HV	**HEATING & VENTILATION SERVICES**				
1	Allowance for mechanical extracts to ensuite	item			1100
2	Allowance for fresh air supply to bedroom 1 (35dBA)	item			2500
FS	**FIRE SERVICES**				
1	Allowance for fire services	m2	37	0	0
EL	**ELECTRICAL SERVICES**				
1	Allowance for electrical services	m2	37	70	2590
SS	**SPECIAL SERVICES**				
1	Telephone & TV services	item			150
SU	**SUNDRIES**				
1	Builders work to services	item			200
PG	**PRELIMINARY & GENERAL**				
1	Preliminary & General	item			5932
				TOTAL	**$ 80,100**

Rachael Pull

From: Malcolm Hunt <mha@noise.co.nz>
Sent: Wednesday, 7 October 2015 11:59 a.m.
To: Rachael Pull
Subject: Re: FW: FW: Further information for PC41

Follow Up Flag: Follow up
Flag Status: Flagged

Rachael,

1. The acoustic insulation requirement is slightly amended to reflect the updated international stds and now precisely describes what is to be achieved (compared to the older way of expressing this requirement). The amendment has no effect on actual degree of acoustic insulation to be achieved - that remains as previously stipulated (> 30 dB).
Thus, there would be no need to change any wording of the noise insulation table etc.

2. Those changes to the Use of Explosives Rule are almost correct, however it recommend the following slight change to make it read properly;

e. ~~The limit of particle velocity (pPeak particle velocity) from blast noise (air blast)~~ blast vibration measured on any foundation of an adjacent occupied building not connected with the site, or suitable location adjacent to the building, shall not exceed 25mm/second for commercial buildings or 10mm/second for dwellings and buildings of similar design.

Regards,
Malcolm

At 11:14 a.m. 7/10/2015, Rachael Pull wrote:

> Good morning
>
> As well as the mining query below, I?ve got another question:
>
> You propose changing the noise insulation formula from $D_{nT,w}+ C_{tr} > 30$ dB to $D_{2m,nT,w}+ C_r > 30$ dB.
>
> How will this affect the noise insulation table that is proposed to be inserted into the Plan to show how to comply?
>
> Thanks
>
> Rachael.
>
> **From:** Rachael Pull
> **Sent:** Tuesday, 6 October 2015 9:33 a.m.
> **To:** 'Malcolm Hunt' <mha@noise.co.nz>
> **Subject:** RE: FW: Further information for PC41
>
> I have gotten confused. Therefore, here is now what is suggested for this rule. Can you please confirm that this is technically correct and incorporates what the submitter asked for:

17.5.4 Mining Explosives.

a. The measurement of blast noise (air blast) from explosives related to mining, quarry, mineral processing or construction activity shall be carried out in accordance with AS 2187.Part 2:~~1993~~ 2006 Explosives Storage and Use Part 2: Use of Explosives.

b. Blast noise (air blast) from explosives related to mining, mineral processing or construction activity shall not exceed a peak sound pressure level of 128dB ~~unweighted BZ~~.

c. Blast noise (air blast) shall be measured at any point within the notional boundary of any dwelling unit, other than a dwelling unit on the same site as the activity.

d. Neighbouring sites shall be advised of pending blasts, at least 48 hours and again at least 1 hour before any such blast.

e. The limit of particle velocity (peak particle velocity) from ~~blast noise (air blast)~~ blast vibration measured on any foundation of an adjacent occupied building not connected with the site, or suitable location adjacent to the building, shall not exceed 25mm/second for commercial buildings or 10mm/second for dwellings and buildings of similar design.

From: Malcolm Hunt [mailto:mha@noise.co.nz]
Sent: Monday, 5 October 2015 11:07 p.m.
To: Rachael Pull < Rachael.Pull@wanganui.govt.nz>
Subject: RE: FW: Further information for PC41

Rachael,

I have checked the submitters request again. I did not quite interpret the request properly. Note first request is to use 128 dB within (a) only. This is accepted as being more technically appropriate.
The second request regarding replacing the words "blast noise (air blast)" with "blast vibration" ONLY relates to (e).
We accept this is more technically appropriate as vibration from blasting will mostly have travelled through the ground. This means it is incorrect to refer to blast noise (air blast) as the source of the vibration being controlled. The amendment recommended by this submitter fixes this error up nicely and is accepted.

Note the Std. referred to in (a) is out of date. (a) should refer to "AS 2187: Part 2: 2006 Explosives Storage and Use Part 2: Use of Explosives"

Regards,
Malcolm Hunt

At 06:02 p.m. 5/10/2015, Rachael Pull wrote:

> Good evening
>
> With Submission 17.3, you have said use the substitution in 15.5.4(a), but not 15.5.4(b). What about 15.5.4(c)? Which is best to use?
>
> Thanks
>
> Rachael.
>
> From: Malcolm Hunt [mailto:mha@noise.co.nz]
> Sent: Wednesday, 30 September 2015 12:42 p.m.
> To: Rachael Pull < Rachael.Pull@wanganui.govt.nz>
> Subject: Re: FW: Further information for PC41

Hi Rachael,
Thanks for that. Please see my responses in blue below each question;

At 02:25 p.m. 29/09/2015, you wrote:
Good afternoon

I have started drafting the hearing reports for the noise plan change and have come across a couple more gaps in my knowledge. Can you please answer the following:

7.4 Submitter Name: MidCentral Public Health Services
Submission No: 17.3pc41
Summary:
Support the assessment methods for mining explosives (Rule 17.5.4), but requests minor changes to the terminology.
Decision Sought:
1. ?128 unweighted BZ? is replaced with ?128 dB?.
Accept- this is technically correct
2. ?blast noise (air blast)? is replaced with ?blast vibration?.
Accept in part - Agree with substitution for 15.5.4(a) but not in (b)
QUESTION: Is this correct?

7.6 Submitter Name: MidCentral Public Health Services
Submission No: 17.5pc41
Summary:
Supportive of the gist of the provisions of Rules 17.5.7-10 (Noise controls for zones), but requests amendments in order with case law and clarity for Plan users
Decision Sought:
1. Rule 17.5.7(a) (Rural zone limits) is retained, but with minor amendments to the terminology.
2. Rule 17.5.7(b-c) (bird scaring devices) is retained.
3. Rule 17.5.8-10 (zone limits) is retained, but with minor amendments to the terminology.

Agree with all those requested changes

QUESTION: Is the terminology changes requested correct? (See attached submission for full details)
7.9 Submitter Name: New Zealand Transport Agency
Submission No: 24.1pc41
Summary:
Supportive of the intention to protect noise sensitive activities from the transport network. The Transport Agency recommends a provision that specifies the internal noise level instead of how the building performs as it relates more closely to the effect that is anticipated to be avoided and it ensures each building is appropriately designed in relation to its distance for the State Highway network.
Decision Sought:
Amend Rule 17.5.3 to restrict noise sensitive activities within 20 metres of the state highway and to require noise sensitive activities within 80 metres of the state highway to have an internal noise level of 40 dB LAeq(24hr) or habitable spaces and no greater than the maximum limits in AS/NZS 2107:2000.

This is linked to NZTA's appeal of PC 36 - See Brenda about this - we don't agree with NZTA methodology but do agree to the general thrust of protecting sensitive indoor spaces to the sorts of indoor Stds they refer, however as a Council we prefer methods based on acoustic rating of the building envelope. This is similar to how Council deals with inter-tenancy noise and other building performance matters. NZTA's approach does not suit rule users or Councils' but will fully achieve NZTA's policy objectives (at no cost) - for these reasons we also view the NZTA approach inequitable.
QUESTION: Do you have an idea/estimate of how much our proposed provisions would add to a cost of a standard house? The table below is what I want to say in my report:

The additional cost of upgrading a new single story 3 bedroom house (excluding GST) to comply with these standards are:
At 60 m and 90m NO special acoustic treatment to deal with highway noise.
I attach a Wellington City report on costs which unfortunately don't fully align with the table you've used. It still has some relevance for cost estimation.

I also understood that this standard would be meet by the current building code. However you have taken out this comment. How much more onerous is this standard on the user?

Testing has shown typical new dwelling will achieve DnTw+Ctr < 28
Typical a new house only has to be marginally improved to meet > 30
Some new houses of solid construction with double glazing can achieve DnTw+Ctr > 35

7.14 Submitter Name: KiwiRail Holdings Limited (KiwiRail)
Submission No: 25.4pc41
Officer Comments

The concern about a ?suitably qualified acoustic engineer? can be altered to a
a. Professional body?
b. Set level of degree?
c. List of approved consultants?
QUESTION: Is there a professional body or qualification we can refer to without needing a peer review each and every time?
The NZ Acoustical Society has devised a system based on expertise & qualifications. The term "Member ASNZ" is intended to be used to identify those persons holding suitable experience and qualifications. The NZS website states "The phrase "suitably qualified acoustic engineer" is commonly used in NZ legislation relating to environmental noise and building acoustics. The Members Register is the full list of current ASNZ Members and is the only definitive record of suitably qualified acoustic engineers in New Zealand.
ASNZ does not publish the Members Register, but interested parties can submit an enquiry to determine whether a person is an ASNZ Member, thereby confirming that person meets the minimum qualification and experience requirements."

7.17 Submitter Name: New Zealand Defence Force
Submission No: 28.1pc41
Summary:
Opposed to the following parts of the proposed Plan change:

1. The definition of noise is broad and does not provide any practical use in terms of the application of the Plan provisions.
2. The vibration performance standards are not appropriate for a permitted activity as it is subjective and not easily quantifiable. NZDF considers such a standard unworkable.

Decision Sought:

1. Remove the proposed definition of noise and exclude the listed activities from the relevant rules.

The propsoed defintion of "noise" is important as it excludes sources not covered by the relevant NZ Stds. The notified definition should be retained - I recommend to decline NZDF this submission point.

2. Amend the proposed performance standard for vibration to refer to the appropriate standard.

There are no relevant New Zealand Standards to assess vibration effects, therefore the issue is
proposed to be dealt under the nuisance provisions of the Health Act 1956 or as an adverse effect
that there is a duty to manage under section 17 of the RMA. Our earlier advie to Brenda was to retain the reference to avoid vibration effects in the polciies and objectives, but to remove the vibration rule. The Std referred to previously as a "guide' has been superceded by a new Std with no specific guidance on adverse vibration effects (measurement only). This is the thinking in some other district plans.
QUESTION: What do we need to do to the vibration provisions to make them work?

Thanks

Rachael.

[1] NZ Transport Agency Building Treatment Costing Study December 2013

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