

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of a Board of Inquiry appointed under s149J of the Resource Management Act 1991 to consider Notice of Requirements and applications for Resource Consent made by the New Zealand Transport Agency in relation to the East West Link roading proposal in Auckland.

**SUMMARY OF EVIDENCE OF JON ROBERT STYLES ON BEHALF OF AUCKLAND  
COUNCIL  
NOISE AND VIBRATION**

## **1. Overview of Key Conclusions of Evidence**

The key points of concern raised in my evidence were as follows:

### **Construction Noise and Vibration (CNV)**

- (a) That a more descriptive assessment of the construction noise effects was required so that the duration and nature of activities generating high construction noise levels can be understood so that the effects on any given receiver can be properly assessed;
- (b) That the assessment of construction vibration effects in Technical Report 8 is very brief and is confined only to people and buildings and does not assess the potential effects on people and businesses such that they are properly understood and provided for;
- (c) That a draft CNVMP should have been provided to demonstrate how the contractor will go about managing the CNV effects during construction;

### **Operational Noise and Vibration**

- (d) In terms of operational noise, that the assessment of subject noise effects was incomplete without a full description of the annoyance categories including % Annoyed and % Little Annoyed;
- (e) That the assessment and design of the Proposal should include the consideration of noise effects into open space, pathways and the Waikaraka Cemetery;
- (f) I suggested that some improvement to the conditions should be made so that the effects considered in this current hearings process cannot vary by more than a small amount should any aspect of the design (of the alignment, noise walls or any other feature) change before or during construction; and
- (g) I recommended that NZTA undertake a further set of noise measurements to determine the veracity of the computer noise model in the vicinity of the PPFs at 31-35 Onehunga Mall.

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I did not provide detailed comment on the proposed conditions when preparing my primary statement of evidence. I note that whilst some of the issues could have been resolved by further assessment, updates to conditions can also be used in response to the remaining issues. At this stage of the process it has been most efficient to focus on the conditions to deal with the issues not resolved.

## **2. Summary of Issues Resolved**

A number of the issues have been resolved directly through expert conferencing (and addressed in the Joint Witness Statements) and other issues have been resolved indirectly by updates and improvements to conditions. The main matters resolved are:

- (a) A draft CNVMP has not been provided at this stage, but there has been significant strengthening of Condition CNV.4 (which requires the CNVMP) to the extent that, whilst a draft CNVMP would be helpful to understand the way that the CNV effects will be managed, I do not consider its provision necessary at this time.
- (b) The assessment of the proportion of the population who are not Highly Annoyed has been explained in the rebuttal evidence of Ms Wilkening and I am satisfied that no further assessment is required.
- (c) The noise generated by the EWL affecting the Waikaraka Cemetery has been addressed by the NZTA and I understand that the BPO will be investigated to minimise noise levels into that space. In my opinion, a level of 50dB  $L_{Aeq}$  would be desirable.
- (d) The assessment of noise effects on other areas of open space and pedestrian facilities has been covered in the expert conferencing process and I understand that noise mitigation for other areas is being considered, including for the land bridge and SUP in the vicinity of SH20. This is likely to include the use of solid barriers above the open section of the open cut required for the EWL in the vicinity of the land bridge, and
- (e) The certainty of the noise model and noise level predictions in the vicinity of Onehunga Mall has been improved by the further measurements and assessment undertaken by Ms Wilkening as addressed in her rebuttal

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evidence. I do not consider that further measurement is required in this area.

### **3. Summary of Issues Not Resolved**

It is important to note that while discussions are ongoing with the NZTA on conditions, the final set of noise and vibration conditions not been finalised and some refinements may be required to ensure that the concerns I have noted in evidence are fully resolved. However, I anticipate that agreement on the conditions relating to these matters can be reached. I consider that the matters below need to be resolved through amendments to the conditions:

- (a) A number of changes to the CNV conditions are required to ensure that activities which are sensitive to vibration (for reasons other than the amenity of its occupants or building damage) are captured and dealt with to avoid, remedy or mitigate the effects of construction vibration on those activities. Such activities include Stratex, Tip Top and any others along the alignment existing at the time construction commences.
- (b) There are only two key areas where disagreement remains, being the means by which the assessment of CNV effects has been undertaken and the need for robust conditions to address this, and the ways by which the operational noise effects are controlled to be no greater than what has been proposed whilst allowing for a small degree of flexibility.
- (c) In my opinion a meaningful assessment of the potential construction noise and vibration effects likely to be generated during the construction of the project has not been provided. Whilst TR8 provides 'envelopes' showing the areas subject to a medium and high risk of noncompliance with the standard CNV criteria, the extent and duration of the high noise and vibration levels are not known, so the effects on the receivers cannot be determined. Whilst I consider that the absence of a full assessment of the effects is problematic, in its absence the conditions need to be robust and capable of dealing with potentially significant adverse CNV effects on the receivers, including disruption to businesses and sleep disturbance for the residential receivers.

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- (d) I have worked with Mr Gouge (Council's planning witness) to prepare a set of conditions which will deal with the CNV effects by improving the stakeholder engagement provisions in the site specific management plan regime and to improve the certainty that the effects on businesses (in particular) can be mitigated and / or remedied. Because this is dealt with by conditions, in practice it will be the Council who determines whether the measures adopted to avoid, remedy or mitigate the effects are adequate. I have suggested that this be demonstrated to the satisfaction of the Council through a site specific management plan as the need arises throughout the construction period.
- (e) In terms of operational noise, the only remaining matter which has not been resolved is the way that the conditions deal with potential changes in the design of the Structural Mitigation measures that could increase the noise level at the PPFs. The original condition ON.4 (b) (as lodged) permitted the noise level to be increased and a PPF to 'jump a category' if the Requiring Authority could demonstrate to the Council that it had adopted the BPO. The process and parameters for this were not defined and my concern is that the process allows for large changes in noise level to be proposed and approved in a process that is not properly designed for it, although I agree that small changes could be processed by such a condition.
- (d) I agree with Ms Wilkening that a small degree of flexibility for the final design is reasonable to allow for very minor changes in the alignment and to account for measurement and modelling uncertainties. A value of 2dB would in my opinion be reasonable. This margin would not be noticeable to any receiver but would afford adequate flexibility. I consider that the conditions should be amended to confine any increase in noise level to only a small amount in the absence of a robust process for the consideration of a larger increase prescribed by conditions.
- (e) There are a variety of ways to achieve this, including minor changes to the current ON.4(b) to include a 2dB limitation notwithstanding a Category change (in terms of NZS6806), or to delete ON.4 entirely and update condition ON.2 to form a 'noise limit' condition which would include the 2dB allowance. This could be based on the charts provided in Ms Wilkening's summary statement, plus the margin of 2dB. If this

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method were used I understand that any design changes that meant that an increase in noise level greater than 2dB would need to be treated as an alteration to the designation. I consider that such a process would properly deal with the assessment of any larger changes in effect that might be proposed.

- (f) I consider that there will be a number of concomitant amendments to the Operational Noise conditions required to cater with either of the amendments suggested above. I expect that such amendments should be straightforward and that agreement with the NZTA is likely.

**Jon Styles**  
**2 August 2017**