

Appendix L

Traffic Noise Assessment

36.5922.R2:GA/CD02

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17 October 2006

TRAFFIC NOISE PLANNING STRATEGY
PROPOSED RESIDENTIAL SUB-DIVISION
STAGED DEVELOPMENT
SANDY BEACH MILL
STAGE 1

1.0 INTRODUCTION

Atkins Acoustics was commissioned by *Bennell & Associates* to conduct a preliminary traffic noise assessment for a parcel of land on the western side of the Pacific Highway, Sandy Beach. The purpose of that assessment was to identify acoustic constraints for the rezoning of the land for future residential development. The findings and recommendations of the preliminary noise assessment were reported by *Atkins Acoustics* (35.5992R1R1), dated December 2005.

The land proposed for redeveloping comprises Lot 260, DP 752853, Lot 1 DP 726077, Lot 2 DP 354878 and lot 1 DP 726078 Graham Drive, Sandy Beach. The land is exposed to road traffic noise from the Pacific Highway “*highway*” and Graham Drive “*collector road*”. It is proposed to redevelop the sub-division land in a number of stages; Stage 1 (southern portion) would be developed for twenty-four (24) building lots (*Attachment 1*), the remaining portion of the land being subject to separate assessments and applications.

This report has been prepared to assist with planning strategy for Stage 1. The report presents the findings of the noise assessment, projected future traffic volumes, predicted future traffic noise levels and ameliorative noise control options for the project.

2.0 ROAD TRAFFIC NOISE PREDICTIONS AND ASSESSMENT

2.1 General

For noise assessment purposes the existing and projected traffic volumes for the highway and Graham Drive were provided by RoadNet and reported in *Atkins Acoustics* (35.5922.R1R1). *Table 1* provides a summary of the fifteen (15) and nine (9) hour traffic volumes for the Pacific Highway and maximum one (1) hour day/night flows for Graham Drive projected for the years 2007 and 2017.

Table 1. Traffic Volumes and Percentage Heavy Vehicles

Description	Traffic Volumes (% heavy vehicles)			
	Year 2007		Year 2017	
	Day	Night	Day	Night
Pacific Highway	14976 (8%)	1381 (29%)	21620 (8%)	1995 (29%)
Graham Drive	346 (5%)	138	449 (5%)	180

For noise modeling and assessment it was assumed that the future building facade set backs would be in the order of 250m from the Pacific Highway and 15m from Graham Drive.

2.2 Road Traffic Noise Assessment Goals

For the assessment of road traffic noise exposure the *DEC, Environmental Criteria for Road Traffic Noise (ECRTN)* recommends goals for new residential development. *Table 2* presents a summary of the *ECRTN* external traffic noise goals.

Table 2. Road Traffic Noise Goals for Residential Land Use Development

Type of Development	Criteria		
	Day 7.00am to 10.00pm	Night 10.00pm to 7.00am	Where criteria are already exceeded
New residential land use development affected by freeway/arterial traffic noise	$L_{Aeq, 15hr}$ 55dB(A)	$L_{Aeq, 9hr}$ 50dB(A)	Where feasible and reasonable, existing noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts
New residential land use development affected by collector traffic noise	$L_{Aeq, 1hr}$ 60dB(A)	$L_{Aeq, 1hr}$ 55dB(A)	Where feasible and reasonable, existing noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts

Where external traffic noise goals are not achieved, the *ECRTN* recommends nighttime internal levels of 30-40dB(A) for sleeping areas. For other living areas, the *ECRTN* recommends internal noise levels 10dB below the recommended external levels on the basis that windows/doors are open to provided adequate ventilation. For typical

residential development this normally equates to a minimum of 20% of the window area open. Where it is not practical to rely on open windows/doors for ventilation, alternative means of ventilation are normally considered acceptable.

For assessing road traffic noise exposure and control strategies for new residential development, the *ECRTN* recommends that the noise be addressed to the building facades and 10 year projected traffic growth volumes are considered.

2.3 Calculation of Road Traffic Noise

Predicted future traffic noise levels for Stage 1 of the sub-division were predicted using the CoRTN road traffic noise model. The model takes into account vehicle volumes, vehicle speed, vehicle classifications, road configuration, off set distances from the road and receiver locations. *Table 3* presents a summary of predicted traffic noise levels to represent the first row exposed building facades, without additional noise mitigation. It is recognised that the first row of dwellings would provide noise attenuation to dwellings set back further from the roads.

Table 3. Predicted Facade Traffic Noise Levels

Description	Traffic Volumes (criterion)			
	Year 2007		Year 2017	
	Day	Night	Day	Night
Pacific Highway	L _{Aeq, 15 hrs} 60.9 (55)	L _{Aeq, 9 hrs} 57.0(50)	L _{Aeq, 15 hrs} 62.5 (55)	L _{Aeq, 9 hrs} 58.5 (50)
Graham Drive	L _{Aeq, 1 hr} 62.0 (60)	L _{Aeq, 1 hr} 58.2 (55)	L _{Aeq, 1 hr} 63.5 (60)	L _{Aeq, 1 hr} 59.5 (55)

2.4 Assessment of Traffic Noise Exposure

The highway predicted traffic noise levels summarised in *Table 3* for the year 2017 show that the external nighttime assessment goal is exceeded by 8.5dB(A) and the daytime goal is exceeded by 7.5dB(A) at lot numbers 10, 11, 12, 13 and 14. Traffic noise levels predicted for Graham Drive show that the nighttime goal is exceeded by 4.5dB(A) and the daytime goal is exceeded by 3.5dB(A) at lots 1, 2, 3, 59 and 60.

3.0 ROAD TRAFFIC NOISE CONTROL OPTIONS

To minimise road traffic noise exposure, control options include increasing distance separation between the road and receivers, the erection of road side or sub-division boundary noise barriers, noise insulation of individual dwellings and/or a combination of the above options. In practice a combination of noise mitigation options is normally preferred. In the consideration of treating individual dwellings, it recognised no benefit is provided to the outdoor amenity.

3.1 Distance Separation

The proposed site layout has been developed to maximise distance separation distances from the highway and Graham Drive where practical.

3.2 Sub-division Acoustic Screens

For the purpose of noise modeling and assessment it was assumed that a 1.8 metre high lapped and capped boundary fences were constructed on the lot boundaries. With the erection of 1.8m high acoustic screens (lapped and capped fences) on the lot boundaries, noise reductions of approximately 5dB(A) could be achieved at the ground level facades, no significant noise reduction would be experienced at first floor facades.

3.3 Building Treatments

The degree of sound insulation required for each dwelling would be dependent on the layout of individual lots and the building designs.

Most residential buildings would provide a noise reduction of approximately 10dB(A) with the windows/doors open and without providing additional acoustic treatment. For lightweight clad buildings, the internal noise reductions with exposed windows closed would be in the order of 20-30dB(A); for masonry buildings the reduction would be in the order of 25-35dB(A). With upgrade glazing (closed windows), noise reductions across building facade of 35-45dB(A) are practical. To enable exposed windows/doors to be closed during periods when noise control is required, a system of “*comfort ventilation*” or “*borrowed ventilation*” may be required.

3.4 Assessment

Considering the recommended internal noise goals (*Section 2.2*) and the predicted external noise levels (*Table 3*), building treatments incorporating not less than 6mm thick glass installed in acoustic rated frames could be installed to provide the noise reductions required to achieve the recommended assessment goals.

Final details and specifications would be dependent on the building locations, building layouts and facade designs and would be detailed when the building types and designs are selected. Additionally, the provision of courtyard walls within a private property would provide localised noise control for outdoor areas.

4.0 CONCLUSION

An acoustic assessment has been conducted for Stage 1 of the residential sub-division on Graham Drive, Sandy Beach (*Attachment 1*). The subdivision land is exposed to road traffic noise from the Pacific Highway “*highway*” and Graham Drive “*collector road*”.

The predicted future traffic noise levels for the sub-division have been predicted using the CoRTN road traffic noise model and traffic projections for the Pacific Highway and Graham Drive.

The findings of the noise modeling and the assessment have shown that noise mitigation measures would be required for dwellings constructed adjacent to the eastern and western site boundaries. The extent of noise mitigation would be dependent on the location of building lots, finished site levels and building type designs, etc.

Considering the exposure to road traffic noise from the Pacific Highway and Graham Drive, a combination of low height boundary screens fences and building treatments have been considered. The screens would control noise for outdoor areas and the ground level of dwellings. Building treatments would be required to control traffic noise intrusion for individual dwellings. The extent building treatments would be dependent on the location of boundary screens and building designs.

As part of any pending Council approval for Stage 1 of the subdivision and referenced to the recommendations of the DEC, ECRTN, internal noise criteria of $L_{Aeq, 1 \text{ hour}}$ 30-40dB(A) could be imposed for sleeping areas. For other areas, internal noise levels 10dB below the recommended ECRTN external levels are recommended on the basis that windows/doors being open sufficient to provided adequate. If the open window noise condition cannot be achieved the ECRTN recommends that with provisions for alternative ventilation the internal noise requirements can be conditioned to be satisfied with the windows closed. *Table 4* provides a summary of the recommended internal noise levels

Table 4. Internal Road Traffic Noise Criteria for Residential Land Use Development

Site Location	Road Traffic Noise Assessment Criteria	
	Day 7.00am to 10.00pm	Night 10.00pm to 7.00am
Lots 10, 11, 12, 13 and 14	$L_{Aeq, 15hr}$ 45dB(A)	$L_{Aeq, 9hr}$ 40dB(A)
Lots 1, 2, 3, 59 and 60	$L_{Aeq, 1hr}$ 50dB(A)	$L_{Aeq, 1hr}$ 45dB(A)

Considering the self-shielding that would be provided by the developed site, noise modeling has shown that no specific noise control requirements other than boundary fences are required for Lots 4, 5, 6, 7, 8, 9, 25, 26, 47, 48, 49, and 50.

We trust the information presented in this report assists with the planning strategy of the Sandy Beach Mill residential subdivision. Please do not hesitate to contact our office if further information or clarification is required.

Yours sincerely,

ATKINS ACOUSTICS & ASSOCIATES PTY LTD.

Graham Atkins

ATTACHMENT 1. STAGE 1 LAYOUT

