REVERB ACOUSTICS
Noise and Vibration Consultants

Our Ref: 10-1471-L6 17 August 2011

Parkway Accommodation Pty Ltd
C/- CKDS Architecture Pty Ltd Ph. (02) 4929 3804
PO Box 958
NEWCASTLE NSW 2300

Attention: Stuart Campbell email: scampbell@ckds.com.au

DESIGN CHANGE – NEW DRIVEWAY NW CORNER OF SITE
RESIDENTIAL DEVELOPMENT – 121-123 UNION STREET, COOKS HILL

This letter has been prepared in response to a design change requested by Newcastle City Council's (NCC's) Compliance Services Unit (CSU) and the Joint Regional Planning Panel. Council have requested that additional access be provided to the carpark via Union Street at the north west corner of the site. The purpose of this letter is to recommend additional acoustic design changes necessary to maintain compliance at nearest residential neighbours. This letter is to be read in conjunction with previous acoustic reports prepared for the site.

Methodology and calculations for the ramp at the NE corner of the site are reproduced below, taken from Reverb acoustics Report 10-1471-R1. Virtually an exact situation will occur at the NW corner of the site, with the exception that the driveway at the NW corner will be level, offering a measure of conservatism:

Vehicles entering and leaving the carparks via the NE and SE access points in Corlette Street has the potential to disturb nearby residents. Due to the non-continuous nature of site activities, noise impacts are assessed using the following in-house mathematical formula.

Equation 2:

$$L_{eq},T = Lw - \left[10\ log\ (20\ log\ R + 8) + 10\ log \frac{(D\ x\ N)}{T}\right]$$

Where Lw is sound power level of source (dB(A))
R distance to receiver (m)
D is duration of noise for each event (sec)
N is number of events
T is total assessment period (sec)

The noise levels used in Equation 2 are the average maximum predicted noise levels produced at the residential boundary. Addition of the received Sound Pressure Level (SPL) from each noise source gives the total SPL at the receiver, which is then compared to the relevant criterion. Where noise impacts above the criterion are identified, suitable noise control measures are implemented and reassessed to demonstrate satisfactory received noise levels.

A worst-case situation for site activities has been assessed for a 15 minute peak period as follows:

- 15 cars enter or leave the site in a single assessment period.
- 2 cars are stationary on the ramp for approximately 10 seconds to await there turn to exit/enter the site.
- Vehicles accelerate to leave the site.

The following Table shows calculation of received noise levels from site vehicles, propagated to nearest residential receivers in Corlette Street (which also apply to Union Street). All calculations are based on distances scaled from plans supplied by CKDS Architects and through physical measurement during our site visits.

Table 7: Vehicle Noise Impact, dB(A). – Nearest Residences in Corlette Street

Activity	Car Travelling In Driveway	Car Stationary In Driveway	Car Accelerating From Site
Lw dB(A)	82	75	84
Ave Dist to rec (m)	18	18	15
Dur of event (sec)	5	10	2
No. of events	15	2	15
Barrier loss/Direct #	10	9	6
Rec dB(A),Leq	35.1	21.4	35.7
Combined	**38.5**		
Crit (day/evening)	**46dB(A),Leq (15 min)**		
Impact	**-**		

Intervening structures, ramp walls, etc.

Vehicles accelerating on the site may also disturb residents at night. The sleep arousal criterion of 51dB(A) implies a maximum allowable sound power level of 83dB(A), when considering distance loss. Vehicles will be travelling at approximately 10km/h and will be under slight acceleration while negotiating the driveway. Previous noise tests by Reverb Acoustics suggest that a vehicle in good mechanical order will produce a sound power level of 75-80dB(A) under these conditions, however wide variations are noted particularly with smaller modern cars and larger V8 or diesel powered vehicles.

Based on the above scenario noise as high as 52dB(A),L1 is predicted at the facade of nearest residences. Peak vehicle noise is 1dB(A) above the sleep arousal criterion, we therefore recommend erecting acoustic fences along the north site boundary adjacent to the carpark ramp. Acoustic fences are to be at least 1800mm in height and contain no significant gaps to allow the passage of sound below the recommended height. Fence design options and locations are discussed in more detail in Section 8.

As can be seen by the above calculations, compliance with the criteria will be achieved at the NW corner of the site also if an acoustic fence as described above is erected from the NW corner of the site to a point at least 10 metres past the end of the carpark entry. Note that the fence may be battered to a lower level for the first 3-4 metres near Union Street for safety reasons. We assume this concludes our involvement in the project thus far. However, should you require further assistance, please contact the undersigned.

REVERB ACOUSTICS

S. Brady.

Steve Brady A.A.A.S. M.A.S.A.
Principal Consultant