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17 December 2006
CRGref: 06689 Letter 17_12_06

Mr. Cameron Davis
Sundowner Developments (NSW) Pty Ltd
PO Box 3095
ROBINA TOWN CENTRE QLD 4230

Dear Sir,

GATEWAY BALLINA RESPONSE TO SUBMISSIONS – BALLINA COUNCIL AND DEPARTMENT OF PLANNING

Thank you for your request for CRG to provide response to submissions regarding the above development. We have reviewed the submissions, and report on the outcome of our investigations:

1.0 Department of Planning Attachment 1 – Acoustic Amenity
The submission makes three points regarding acoustic amenity as follows:

- Objection to increase in traffic noise as a result of the new development;
- Concern about noise traveling across the water;
- Concern about noise, vibration (stability of nearby buildings) and shock during construction.

Further submission have been made by the Department of Planning, and have also been addressed in this letter.

We offer the following comment regarding the above dot points:

Increase in Road Traffic Noise Levels
For the proposed development to increase existing road traffic noise levels by more than 2 dB (the limit specified under the *Environmental Criteria for Road Traffic Noise*), the development would need to generate a further 15,000 vpd (vehicles per day) movements per day, as River Street currently carries approximately 25,000 vpd. The development will not generate such a level of traffic.

Concern Regarding Noise Across Water

Noise has been assessed at the nearest residential receivers. Although we acknowledge that sound propagates across water better than across land, the separation distance to the nearest dwellings across water is greater than that assessed to the nearest dwellings across Kerr Street from the subject site.

Concern Regarding Construction Noise and Vibration

Noise and vibration from the construction phase will be managed, with an example of a noise and vibration management plan attached to this letter.

Vibration testing will need to be conducted prior to works being fully undertaken on the site, with a test taking into account activity nearest offsite buildings. Should vibration level exceed the criteria, specialist vibration consulting services will be required.

Further to the above dot points, Ballina Shire Council and The NSW Department of Planning raised queries as follows:

1. Monitoring period conducted over three (3) days and not the standard seven (7) days as outlined in 3.5 of the Industrial Noise Policy (INP) NSW EPA 2000. Section 3.5 however does state, *that in areas where the background noise levels are affected significantly by nearby road traffic with regular daily pattern, three (3) days worth of valid data may be sufficient. However, care should be exercised in assuming a pattern of noise levels in an area. It is recommended that, where any doubt exists, the full week's monitoring should be performed.* The subject ENIA does not justify why the three (3) days worth of data is valid for this development.

- The noise logger was only deployed for 3 week days (no weekend days/nights) and no operator-attended monitoring appears to have been conducted.

  The DEC's *Industrial Noise Policy* requires equivalent to one week's worth of valid data covering the days and times of operation of the development. Continuous sampling should be accompanied by periods of operator-attended monitoring. In areas where the background noise levels are affected significantly by nearby road traffic with regular daily pattern, three days' worth of valid data may, in some cases, be sufficient. However, as there are commercial activities in the area which have the potential to generate more noise over the weekend (Ballina RSL, Ballina Hotel), care should be exercised in assuming a pattern of noise levels in the area. It is recommended that the full week's monitoring should be performed.

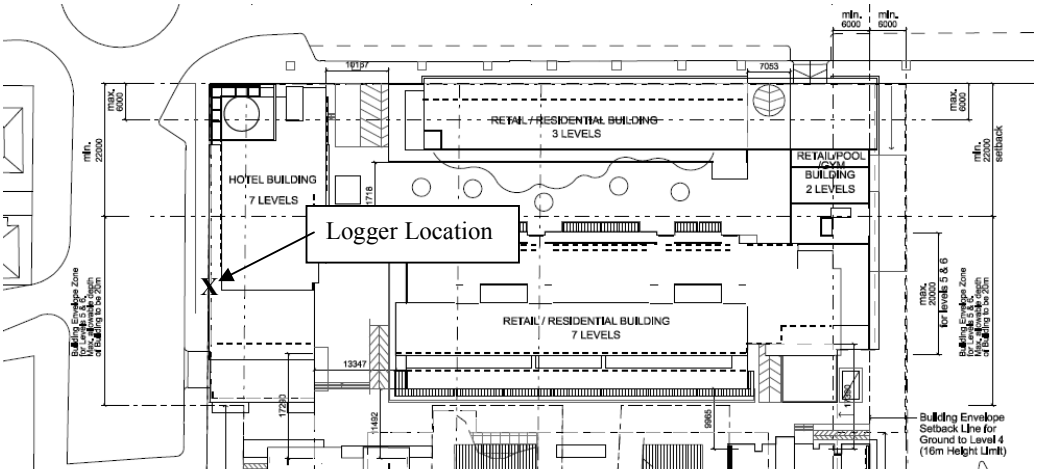
Response We note that the data collected was quite consistent, with little variation between days. This factor, coupled with other noise level measurements in the local area for other projects confirmed that the data collected should be sufficient. This point notwithstanding, we propose to undertake further monitoring at the site.

2. Actual location of the noise logger on the site is unclear. The ENIA states that the logger was located towards the southern end of Kerr Street but site is unclear. The Environmental Criteria for Road Traffic Noise (ECRTN) NSW EPA 1999, in the Technical Notes on page 12 points (iii) and (v) explains assessment location for traffic noise.

3. **Environmental Noise Impact Assessment (ENIA)**

- It is not clear where the noise logger was deployed on Kerr Street for the Environmental Noise Impact Assessment (ENIA) undertaken by Carter Rytenskild Group. There is no note on Sketch 1 to note its location as indicated in the report.

The Sketch below marks the logger location



The logger was located at the above position for security reasons – it was not secure or safe for equipment to be located on the River Street frontage of the site.

3. ENIA on page 4 references Bayshore Drive?

- Section 4.1 of the ENIA refers to Bayshore Drive. There is no road with this name in the vicinity of the development. Has the correct criteria been used for the proposed activity?

Response The reference to Bayshore Drive is a typographical error, and should read *River Terrace*. The correct criteria has been applied for the assessment.

4. The ENIA reference LA10 throughout the report and this should be an LAeq to account for all noise including peaks

Response The use of average maximum or L10 levels is viewed as a more conservative descriptor than the Leq level, especially for short duration noise events – this is due to the fact that the Leq level "averages" across the 15 minute measurement time, whereas the L10 is the average maximum noise level. As an illustration, a low-usage car park may generate approximately 20 dB less noise when assessed as an Leq rather than the average maximum level.

5. Considering the intrusiveness and amenity criteria the following noise limits should apply.

	Intrusiveness	Amenity
Day	55	60
Evening	47	50
Night	40	45

An intrusiveness criterion is the limiting criterion and represents the project-specific noise levels to be applied to this project.

Response Noted. The difference in the noise limit criteria is the evening limit, which was reported as 50 dB(A), rather than the level of 47 dB(A) presented above. This does not alter our conclusions that the Café/restaurant alfresco dining areas be limited to use until 8pm.

6. Page 5 of the ENIA recommends applying a design target level of 45dB(A) LA10 inside a dwelling from short term noise events. This statement is not explained and therefore does not make sense. LA10 should not be referenced as the appropriate parameter to measure is LAeq. If 45dB(A) is the target level inside then the outside is 55dB(A) or greater and this does not meet the project-specific noise levels.

Response It is often not possible to achieve outdoor amenity levels at high rise buildings adjacent to major roadways, and in close proximity to commercial activity. For this reason, we have applied an indoor noise level criteria for short duration noise events of 45 dB(A). This should be reasonable, when it is considered that living areas allow a level of 45 dB(A) as an Leq (which allows more noise than the average maximum L10 level used in the assessment). Further to this, the World Health Organisation (Bergland et.al., "Environmental Noise") specifies a level of 45 to 50 dB(A), 10 to 15 times per sleeping period for short duration noise events. By applying the lower end of the scale, the number of events should not be an issue.

7. Road Traffic Noise Criteria and Table 2 of the ENIA indicate the recommended Design Sound Level in LAeq with sleeping areas being the most restrictive having a maximum level as 40dB(A).

Response: We note that the 40 dB(A) level is an Leq descriptor rather than an L10. This Leq level has been used as the target design level inside apartments from road traffic noise.

8. The acoustic measures specified for Block F along eastern side, which will be impacted upon from vehicle movements and patrons voices particularly at night, have not been considered.

The report provided the following in relation to Block F:

> "*We recommend that all proposed residential spaces not listed in the above Table 4 be acoustically treated to achieve a performance level of no less than Rw 28, apart from Block the easternmost units in Blocks F and D, which should be constructed to achieve a performance of Rw 31 (e.g. 6.38mm laminated glass in acoustic grade sliding door or window frames).*"

The above treatment would ensure an indoor sound level of 45 dB(A) L10 from patrons and vehicular movements.

9. Minimal consideration has been given to the assessment of noise on the residential dwellings surrounding the proposed development particularly to the west of the site. Table 5 in Section 5.4 Predicted Commercial Activity Noise Impact Levels predicts the impacts from proposed onsite activity at the nearest proposed residences onsite and the residential premises to the west across Kerr Street. However these are indicated in LA10 and the table doesn't reference residential premises to the west?

We note that the L10 level was used as the assessment noise source descriptor, which tends to be higher than an Leq, which is "averaged" over a 15 minute time period. For this reason, Leq levels predicted will be lower than those quoted in the table. The table in the report presents levels at the Kerr Street dwellings to the west, with the levels presented in the first column in the table. Refer to the table below for clarification (the Kerr St dwelling levels have been bolded):

		Predicted impact level, SPL dB(A) L_{10}		
Source	Source level L_{10} @ 1m	**Façade**	Inside	Facade
Manually unloading truck in basement	85	**54**	46	63
Manually unloading truck on River Street	85	**46**	38	70
Patrons inside restaurant	80	**50**	42	59
Patrons Alfresco Café area	85	**52**	45	65
Car door closure basement	83	**48**	41	58
Low level music in Function room	100	**39**	32	50
Waste collection Kerr St	97	**74**	67	83
Waste collection River St	97	**68**	61	83

10. The report has not given any consideration to surrounding activities (i.e. service station and licensed hotel) that might impact upon the proposed development. Only minimal consideration was given to the RSL carpark.

Response: Noise from the major roadway (River Street) is predicted to impact at levels above building treatments required to achieve an acceptable indoor noise level from car door closures or truck airbrakes. As an illustration, if we assume unloading a truck at the Service Station is 78dB(A) Leq at 1m from the source, we predict an impact level of 51 dB(A) at the northern façade facing River Street, which equates to an Rw 24 for façade treatments to achieve an indoor sound level of 45 dB(A). The road traffic noise treatments for the northern facade are at, or above Rw 30.

11. No consideration has been given to construction noise in the ENIA and the impact on the surrounding residential properties.

Response: We will provide a comprehensive construction noise and vibration management plan will developed during planning construction. The best time to formulate such a plan is when specific construction methodology has been determined. Refer to an example of a noise and vibration plan attached.

12. No consideration has been given to external balconies and the acceptable level for these. These areas still need to be considered accordingly by the INP and ECRTN. Section 7.0 of the ENIA states *that future occupants should reasonably expect noise intruding onto balconies from commercial landuses in the locale.* This is not always the case and consideration of noise on external balconies is required to be considered. Section 7.0 also states that the report recommends mitigating noise from most onsite commercial activities to achieve an indoor level of 45dB(A), which should be 40dB(A) refer to Point 5. This is only achievable with all windows and doors closed therefore placing restrictions on openings and enforcing the provision of mechanically ventilation.

Response: The levels reported represent the impact levels at balconies. Given the mixed use nature of the development, it is not possible or practical to achieve the criteria of the INP or the ECRTN, hence, the submission that achieving indoor sound levels is a reasonable compromise. We note that reference has been made to the indoor level of 345 dB(A), which should be 40 dB(A). These two criteria of 40 and 45 dB(A) are different, with the 40 dB(A) level being for continuous noise (e.g. road traffic), with the 456 dB(A) level being for short duration noise events such as car door closures, or patron noise.

13. Section 7.0 states that *road noise impacts has been recommended through building shell treatments to achieve indoor noise levels* this means that sleeping areas must have a maximum sound level of 40 dB(A) refer to above Point 7 which has not been demonstrated. This point contradicts the earlier comment in Section 7.0 which also states that the report recommends to mitigate noise from most onsite commercial activities to achieve an indoor level of 45dB(A), which should be 40dB(A) refer to Point 12.

We refer to the above submissions regarding short duration noise events compared to continuous noise.

- The ENIA does not include any assessment of the existing commercial activity noise impacts from the Ballina Hotel at 253 River Street. This hotel operates until 3:00am. How will the residential accommodation in Building C be acoustically attenuated to ensure that persons staying in the accommodation cannot be disturbed from activities occurring outside?

Response: Noise impacts at the subject site are dominated by road traffic noise impacts. For this reason, the units fronting River Street have high performance facades treatments (e.g. Rw 30 to 32) specified that will reduce typical noise impacts from patron activity outside the Hotel to within the 45 dB(A)L10 level discussed above for short duration noise events.

- There is no indication of wind speed or direction given for the period of noise monitoring.

Response: We attach a copy of the Bureau of Meteorology data from Ballina Airport that includes the noise logging measurement period.

Ballina, New South Wales
May 2006 Daily Weather Observations
Observations from Ballina Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Mo	13.0	25.0	10						20.1	67		WNW	19	1010.5	24.4	44		W	26	1006.0
2	Tu	9.0	23.0	0						19.8	45		WSW	22	1010.3	22.0	44		S	9	1009.0
3	We	9.0	24.0	0						18.8	52		W	15	1016.2	23.4	31		NNW	9	1014.2
4	Th	7.0	24.0	0						19.7	51		WSW	17	1019.8	22.3	49		SSE	17	1018.4
5	Fr	9.0	25.0	0						18.3	78		WSW	4	1020.1	22.8	62		NE	20	1015.9
6	Sa	8.0	24.0	0						20.2	58		W	17	1017.2	22.5	47		SSE	19	1013.9
7	Su	8.0	26.0	0						18.1	79			Calm	1016.7	24.7	54		NNE	17	1012.0
8	Mo	11.0	23.0	0						20.2	57		WSW	17	1016.5	21.2	58		SE	22	1014.8
9	Tu	10.0	22.0	0						16.9	54		W	15	1021.5	20.5	49		ESE	11	1018.1
10	We	7.0	24.0	0						16.8	78		SW	4	1019.2	20.8	38		SSE	15	1017.0
11	Th	8.0	23.0	0						18.3	62		WSW	13	1024.2	21.0	67		S	22	1022.0
12	Fr	15.0	20.0							16.9	89		WSW	11	1024.9	17.6	86		S	15	1023.0
13	Sa	13.0	22.0	8						16.3	91		W	15	1024.6	20.5	69		SSE	20	1020.6
14	Su	8.0	22.0	0						16.9	83		WSW	13	1021.6	21.4	64		S	17	1019.3
15	Mo	12.0	21.0	1.0						18.6	76		SW	22	1022.8	18.3	82		S	20	1022.1
16	Tu	13.0	21.0	40						17.9	79		WSW	13	1027.6	20.7	54		SSE	15	1025.6
17	We	13.0	21.0	1.0						16.2	88		WNW	7	1028.0	20.2	65		S	9	1025.2
18	Th	14.0	22.0	15						18.3	78		WSW	17	1026.4	19.9	70		S	11	1023.8
19	Fr	14.0	22.0	3						17.7	80		WSW	13	1025.4	21.0	69		SSE	11	1022.6
20	Sa	11.0	23.0	0						18.8	85		SW	11	1024.3	22.3	62		SE	13	1021.9
21	Su	11.0	22.0	0						18.2	79		WSW	20	1027.3	19.5	77		S	20	1024.2
22	Mo	13.0	21.0	0.2						16.1	88		WNW	6	1024.1	19.6	75		E	9	1018.7
23	Tu	11.0	21.0	1.0						16.6	79		WSW	17	1017.2	19.8	57		SSE	9	1013.8
24	We	6.0	21.0	0						14.7	42		W	11	1014.3	20.1	28		NW	13	1010.6
25	Th	5.0	21.0	0						16.4	51		W	15	1015.9	20.0	51		SSE	15	1013.9
26	Fr	6.0	22.0	0						14.9	73		W	13	1019.0	20.1	56		SE	15	1016.2
27	Sa	7.0	21.0	0						15.1	83		W	11	1019.7	19.5	68		S	17	1017.0
28	Su	8.0	20.0	0						16.5	73		W	15	1019.9	18.3	57		S	19	1016.8
29	Mo	8.0	21.0	0						16.4	72		W	11	1019.8	19.8	55		ESE	11	1016.3
30	Tu	8.0	21.0	0						16.8	46		WNW	17	1018.8	18.6	46		SSE	19	1016.2
31	We	5.0	20.0	0						13.4	71		W	9	1018.0	19.5	27		WNW	11	1013.6
Statistics for May 2006																					
	Mean	9.7	22.2							17.4	70			13	1020.4	20.7	56			15	1017.5
	Lowest	5.0	20.0							13.4	42			Calm	1010.3	17.6	27		#	9	1006.0
	Highest	15.0	26.0	40						20.2	91		#	22	1028.0	24.7	86		W	26	1025.6
	Total			79.2																	

Observations were drawn from Ballina Airport AWS (station 058198)
The closest station with sunshine and evaporation observations is at Alstonville, about 10 km to the west.

IDCJDW2006.200605 Prepared at 16:00 GMT on 7 Dec 2006

- The ENIA states that *"the northern row of the proposed buildings provide a significant level of acoustic screening to the roadway, and from commercial premises within the subject site to the off-site dwellings".*

  If the northern row of the proposed buildings provides an acoustic screening to the roadway, the Department is concerned that the residents of the serviced apartments in Building C will be exposed to unacceptable noise.

  The Department is concerned that no ambient noise monitoring was undertaken on River Street, which is considered to be a highly sensitive location in terms of noise impacts from existing traffic and commercial activity.

Response:
The report recommends that Building C units have high performance acoustic treatments to the building façade (e.g. between Rw 30 to 32), that will ensure compliance with the indoor noise criteria as specified in AS/NZ2107.

We note that the ambient noise measurement location (e.g. the logger location) had a direct line of sight to River Street, therefore, road traffic noise was taken into account during monitoring. From onsite observation, noise from commercial activity was generally masked by road traffic noise from River Street, which carries a significant traffic volume load.

We trust the above is of assistance; please do not hesitate to contact the undersigned regarding any queries in relation to the above information.

Yours faithfully
CRG TRAFFIC & ACOUSTICS PTY LTD

JAY CARTER BSc
DIRECTOR
BSc

EXAMPLE NOISE AND VIBRATION MANAGEMENT PLAN

We recommend that the construction firm observe the following treatments and principles to manage potential noise impacts:

a) Use of an electric overhead crane, located centrally within the site (refer to Figure No. 1 attached);

b) Assign the task of managing noise emissions to a person (the 'responsible person') that is contactable at all times (e.g. 24 hours per day), and is likely to be present on-site most of the time that activity is occurring. This person would be responsible for handling noise complaints sensitively, and ensuring that work does not commence before the times specified in Section 3 above. The 'responsible person' should maintain a Noise Complaint Record, with an example recording form attached to this report.

c) The 'responsible person' should also conduct regular observations of noise levels from the construction activities at the nearest residential boundaries. Should any noise sources be identified as being able to be practically relocated further away from the residential area, or screened by a solid object such as a wall, the 'responsible person' should undertake to have the source relocated.

d) Providing residents of nearby dwellings with an indicative schedule of the works program, in particular, a clear notification of the times that pile driving, or other noisy activities are to be conducted proximate to the residential premises. This notification should also include contact details of the 'responsible person' should residents wish to discuss the onsite activity.

e) Ensuring that works are strictly limited to 7 a.m. and 6 p.m. Monday to Friday, and 7am to 4pm on Saturdays.

f) Maintenance of equipment. Regular maintenance of stationary and mobile equipment, including off-site vehicles. By maintaining equipment, noise emissions from older equipment will be similar to that of new equipment.

g) Use and siting of equipment. By locating noisy equipment as far away from noise sensitive premises as is practical, distance separation will reduce potential noise impacts. Unloading building materials should be conducted as far away from noise sensitive premises as possible, and is demonstrated in the plan provided in Figure 1. The optimal location for stationary plant such as compressors is proximate to the Martin Street loading area. Loading activity on Fawcett Street should be undertaken (where possible) towards the Regatta Avenue side of the site, rather than proximate to the Pelican Moorings building.

h) If complaints arise regarding noise, the complaint will be directed to the 'responsible person', who will determine the source of the noise, and take immediate steps to mitigate the noise. This may involve moving the noise source further away from affected premises, replacing the equipment, or in some cases, engaging a qualified acoustic consultant to provide specialist control advice.

i) Pile driving operations should be monitored for vibration impacts at the nearest buildings. Vibration levels should not exceed 10 mms^{-1} peak particle velocity. This level will ensure structural integrity of neighbouring structures, and also takes into consideration human comfort. Testing should be conducted prior to works being fully undertaken on the site, with a worst case scenario test conducted to ensure compliance with the vibration criteria.