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Proposed Mixed Use Development,
Cabarita

**CONSTRUCTION
NOISE MANAGEMENT PLAN**

20 February 2009

crgref: 07655a construction noise report



1. INTRODUCTION

CRG Traffic & Acoustics Pty Ltd have been engaged by W A Stockwell Pty Ltd to produce a acoustic construction noise management plant for a proposal to develop a mixed use facility in Cabarita. The location of the subject site is shown in Figure 1.1 below.

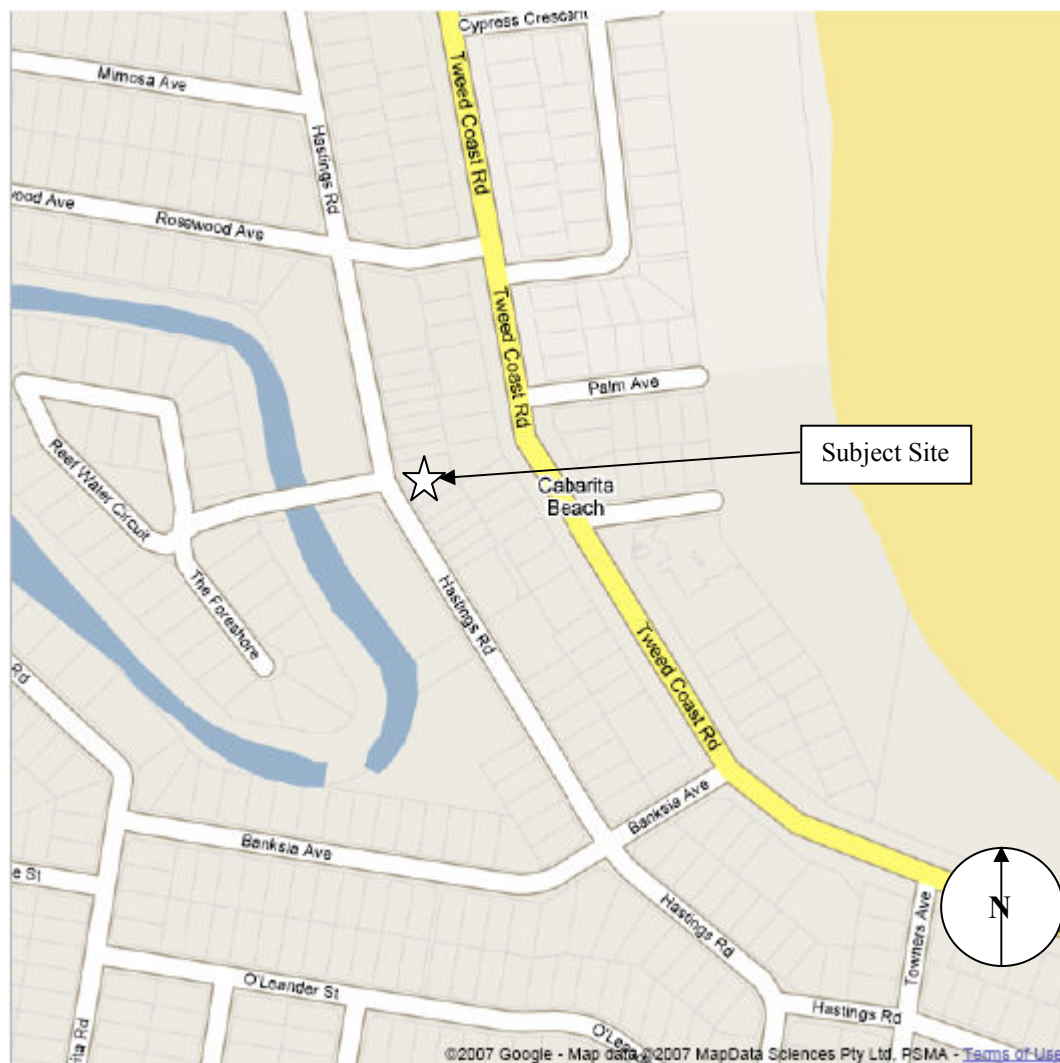


Figure 1.1 – Location of Subject Site

2. THE PROPOSAL

The subject site is located on blocks located between the Tweed Coast Road and Hastings Road, on land that falls away from Tweed Street down to Hastings Road. The arrangement is proposed as follows:

- **Lower ground level:** Access off Hastings Road into basement parking for residential component and some supermarket parking. The loading dock is also proposed off Hastings Road. At grade parking is proposed for the northern portion of the development;
- **Upper ground level:** Supermarket towards the southern portion of the site, with specialty stores and a kiosk;
- **Mezzanine level:** Car parking accessed off internal ramp;
- **Level 1:** Two bed apartments facing Tweed Coast Road and Hastings Road with large communal recreation space on the Hastings Road side;
- **Level 2:** Roof terrace fronting Tweed Coast Road.

The site is adjacent to other commercial premises to the immediate north on the Tweed Coast Road (eastern) side of the site, vacant land to the immediate south, a childcare centre to the immediate south-west of the site (on Hastings Rd). Two storey apartments are located across Hastings Road to the west.

For site location and site layout, refer to Figures 2.1 below.

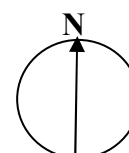


Figure 2.1 – Subject Site and Locale

3. NOISE LIMIT CRITERIA

Tweed Shire Council have no specific code for management of construction noise under the Town Plan, but sets standard conditions for limitation of hours of operation to 7am to 7pm, Monday to Saturday, and also require that in the event of a bona fide noise complaint, then the noise impacts will be assessed against the daytime background noise level + 15 dB.

Based upon measured background noise levels recorded for the initial development application, a limit of 57 dB(A) applies under the 'background + 15 dB' criteria for activities conducted during daytime hours. For noise generated by dewatering of the site, a limit of background level + 5 dB applies, resulting in a limit of 35 dB(A) for the night period (this only applies to the dwellings across Hastings St and not the Childcare Centre, as it is unoccupied at night).

As a guide, Tweed Shire Council have imposed the following criteria to other construction projects in the past:

DURING CONSTRUCTION

Construction site work including the entering and leaving of vehicles is limited to the following hours, unless otherwise permitted by Council: -

Monday to Saturday from 7.00am to 7.00pm
No work to be carried out on Sundays or Public Holidays

The proponent is responsible to instruct and control subcontractors regarding hours of work.

All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. In the event of complaints from the neighbours, which Council deem to be reasonable, the noise from the construction site is not to exceed the following:

- A. Short Term Period - 4 weeks.
L10 noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 20dB(A) at the boundary of the nearest likely affected residence.
- B. Long term period - the duration.
L10 noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 15dB(A) at the boundary of the nearest affected residence.

All work associated with this approval is to be carried out so as not to impact on the environment. All necessary precautions, covering and protection shall be taken to minimise impact from: -

- Noise, water or air pollution
- Minimise impact from dust during filling operations and also from construction vehicles
- No material is removed from the site by wind

Practical measures to the satisfaction of the General Manager or his delegate are to be taken to acoustically shield all pumps used for dewatering operations to minimise any noise disturbance to neighbouring or adjacent premises.

Further to the above, Australian Standard AS 2436 – 1981 “Guide to noise control on construction, maintenance and demolition sites” provides extra guidance for management of on-site noise.

4. MANAGEMENT PLAN OBJECTIVE

The objective of this management plan is to minimise noise from construction activities impacting onto adjacent noise sensitive landuses, which include both the nearby dwellings, and the adjacent Childcare Centre.

5. ON-SITE SOURCES OF EMISSION & EXISTING ACOUSTIC ENVIRONMENT

Sources of noise typically associated with development of commercial buildings are as follows:

- Delivery trucks and on-site trade vehicle movements;
- Earthmoving vehicle movements (ie. Front-end loaders, excavators);
- Trade tools (ie. air compressors, hammering, power tools);
- Water pump for dewatering the site.

We have conducted noise level measurements of a dewatering pump, and report that the unit tested (a Shorco QSSS150 6” pump) generates approximately 62 to 65 dB(A) L_{eq}^1 at 2m from the unit. Based upon typical noise decay rates, and locating the pump at the point defined in Sketch No. 2 (e.g. the centre of the site towards the eastern boundary), and erecting a semi enclosure around the pump that cuts line of sight from the pump set to the adjoining dwellings to the north-west and childcare centre, we predict that the pump, and other typically occurring noise (assessed at the nearest and furthest location from the receivers), will impact at the following levels:

Noise Source	Predicted Noise Impact Level, SPL dB(A)	
	Childcare South-west	Apartments West
Dewatering pump (QSSS150)	36	31
Hammering	58 – 81	65 – 80
Front end loader	38 – 67	45 - 60

Refer to the attached calculation sheet for noise prediction methodology.

¹ The L_{eq} noise level can be loosely defined as the ‘average’ noise level over a measurement period, typically 15 minutes, and is commonly used to describe ambient noise levels

6. RECOMMENDATIONS

6.1 Recommended Noise Reduction Treatments and Management Principles

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

- a) Using a Shorco Sykes silenced dewatering pump (QSSS150) or an equivalent unit and locate as close to the centre of the site, towards the eastern boundary as possible;
- b) A temporary acoustic barrier be located around the pump set, that cuts line of sight to windows at both the western dwellings, and to the Childcare Centre;
- c) Ensuring that works are conducted between 7 a.m. and 7 p.m. Monday to Saturday. In special cases, if the time restrictions cannot be met, the construction manager should contact Council for a temporary relaxation of the time restriction. It would be necessary to notify all potentially affected residents that out of hours work will be conducted, and the times for such works.
- d) 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.
- e) 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.
- f) Assign the task of managing noise emissions to a person (the 'responsible person') that 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.
- g) Encouraging workers to not congregate outside the site before 6.45 a.m.
- 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.

6.2 Performance Indicators

As the intent of the management plan is to avoid noise annoyance from building works, we submit the performance indicator should be that the site is not the subject of noise complaints.

7.0 CONCLUSION

Tweed Shire Council generally apply conditions under the development approval that limit hours of operation, and in the event of a bona fide noise complaint, require that the activity should not exceed the background noise level + 15 dB for activities occurring during daytime hours. We have assessed background noise levels during the daytime, and conclude that the criteria would be approximately 57 dB(A) for daytime. Noise from activity conducted in the night period (e.g. dewatering) should be limited to 35 dB(A) at the nearest dwelling (e.g. across Hastings Street).

Subject to use of the silenced pump, the localized barrier and location as per the attached sketch, noise from the dewatering pump is predicted to impact at levels well below the limit of 35 dB(A). The pump recommended is used by Council in sensitive areas, and is considered a “best practice” design for noise control.

It is not possible to strictly comply with the “background + 15” criteria as applied by Council for typically occurring outdoor activities such as hammering or using a nail gun, nor has any construction site within 260m of an existing residential premises ever complied with the criteria (assuming a noise limit of 57 dB(A), and an unobstructed line of sight from source to receiver). There are limited options for control of onsite activity noise, apart from the management principles listed in Section 6.1, above. It must be noted that the recommended treatments are considered ‘best practice’ in terms of management of noise for (relatively) short term building activities.

Report compiled by:



Jay Carter BSc
Director

Across Hastings St (West)			Adjacent Childcare		
Noise level PUMP (QSSS150)	65	dB(A) Leq	Noise level PUMP (QSSS150)	65	dB(A) Leq
Distance from source	2	m	Distance from source	2	m
Distance to receiver	55	m	Distance to receiver	31	m
Obstructions 1.8m barrier	-8	dB(A)	Obstructions 1.8m barrier	-8	dB(A)
Distance decay	-29	dB(A)	Distance decay	-24	dB(A)
Façade reflection	3	dB(A)	Façade reflection	3	dB(A)
Impact at façade	31	dB(A) Leq	Impact at façade	36	dB(A) Leq
Noise level HAMMER	103	dB(A) L10	Noise level HAMMER	103	dB(A) L10
Distance from source	1	m	Distance from source	1	m
Distance to receiver	19	m	Distance to receiver	8	m
Obstructions	0	dB(A)	Obstructions (building)	-6	dB(A)
Distance decay	-26	dB(A)	Distance decay	-18	dB(A)
Façade reflection	3	dB(A)	Façade reflection	3	dB(A)
Impact at façade	80	dB(A) L10	Impact at façade	81	dB(A) L10
Noise level HAMMER	103	dB(A) L10	Noise level HAMMER	103	dB(A) L10
Distance from source	1	m	Distance from source	1	m
Distance to receiver	101	m	Distance to receiver	114	m
Obstructions	0	dB(A)	Obstructions (building)	-6	dB(A)
Distance decay	-40	dB(A)	Distance decay	-41	dB(A)
Façade reflection	3	dB(A)	Façade reflection	3	dB(A)
Impact at façade	65	dB(A) L10	Impact at façade	58	dB(A) L10
Noise level FE LOADER	83	dB(A) L10	Noise level FE LOADER	83	dB(A) L10
Distance from source	1	m	Distance from source	1	m
Distance to receiver	19	m	Distance to receiver	8	m
Obstructions	0	dB(A)	Obstructions (building)	0	dB(A)
Distance decay	-26	dB(A)	Distance decay	-18	dB(A)
Façade reflection	3	dB(A)	Façade reflection	3	dB(A)
Impact at façade	60	dB(A) L10	Impact at façade	67	dB(A) L10
Noise level FE LOADER	83	dB(A) L10	Noise level FE LOADER	83	dB(A) L10
Distance from source	1	m	Distance from source	1	m
Distance to receiver	101	m	Distance to receiver	114	m
Obstructions	0	dB(A)	Obstructions (building)	-6	dB(A)
Distance decay	-40	dB(A)	Distance decay	-41	dB(A)
Façade reflection	3	dB(A)	Façade reflection	3	dB(A)
Impact at façade	45	dB(A) L10	Impact at façade	38	dB(A) L10