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BUNNINGS WAREHOUSE DEVELOPMENT, 727-737 THE HORSLEY DRIVE AND 73 VICTORIA STREET, SMITHFIELD NOISE IMPACT ASSESSMENT

Report No. 10-315

Date 3 December 2010

Prepared for: Bunnings Group Limited
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TABLE OF CONTENTS

1. INTRODUCTION

It is proposed to develop a Bunnings store on The Horsley Drive, O'Connell Street and Victoria Street, Smithfield.

This report assesses the potential noise impact.

2. DESCRIPTION

The location can be seen in the aerial view in Figure 1. It faces O'Connell Street and runs between The Horsley Drive and Victoria Street in Smithfield. No 727 The Horsley Drive is currently vacant and has most recently been used as Automatic Transmission Specialists and car park. No 73 Victoria Street is occupied by a 1-2 storey industrial building used for smash repairs. The proposal is for a car park with warehouse above.

The area is commercial with many industrial uses. On the southern side of The Horsley Drive and west of O'Connell Street is Smithfield Public School and Smithfield Baptist Church on the corner. On the southern side of The Horsley Drive and east of O'Connell Street are market gardens and houses with No.734 being the closest to the site. Both The Horsley Drive and Victoria Streets carry heavy traffic.

Carpark access will be from O'Connell Street and Victoria Street. Delivery vehicle access is off Victoria Street and they will leave the site via The Horsley Drive.

Store operating times are expected to be 7am to 9pm Monday to Friday and 8am to 6pm on weekends and public holidays. Deliveries will be between 7am and 10pm. Night filling may occur outside of normal store trading hours.

Figure 1 An aerial view of the site showing noise measurement locations

Figures 2 and 3 show the warehouse and carpark site plans.

Figure 2 Site plan warehouse level

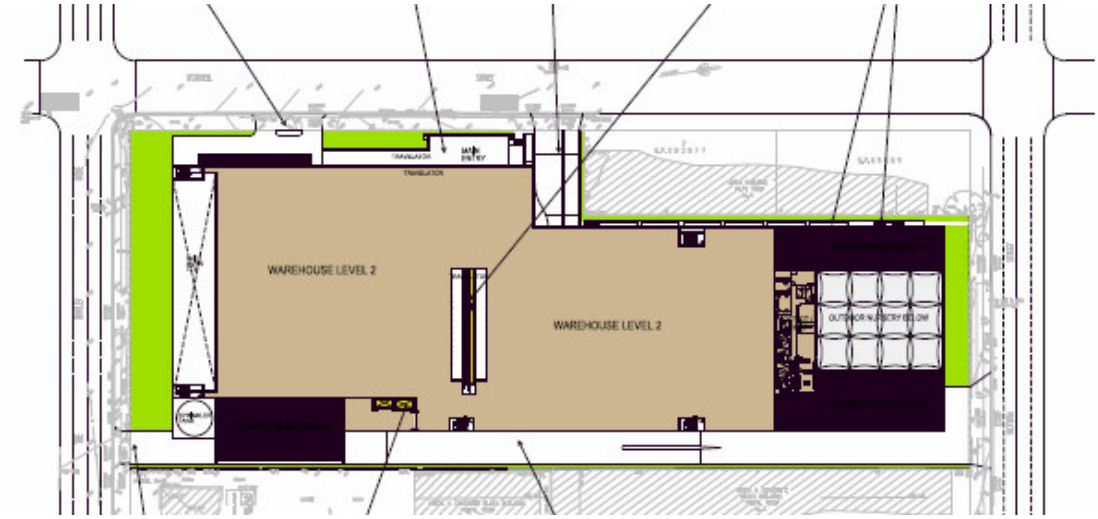
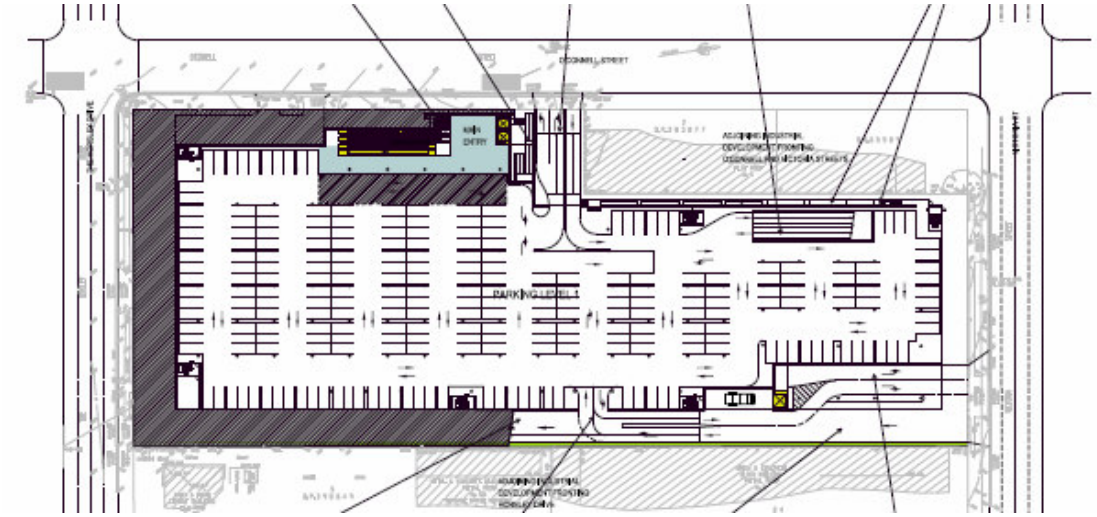


Figure 3 Site plan main carpark level



3. EXISTING NOISE AND CRITERIA

3.1. Existing Noise Levels

The existing noise environment was measured on Wednesday 3 November 2010.

Short term attended monitoring was used rather than an unattended logger so as to gain a fuller understanding of the noise environment and to measure more sites.

The measurement sites were:

- 1. Outside 734 The Horsley Drive
- 2. Outside Smithfield Public School on The Horsley Drive.
- 3. Halfway along the O'Connell Street facade.
- 4. On Victoria Street near the corner with O'Connell Street.

The main noise source was traffic on both The Horsley Drive and Victoria Street. The measured noise levels are shown in Table 1.

Table 1 Measured noise levels (dBA)

Location & time of day	Noise level in dBA		
	L_{Aeq}	L_{Amax}	L_{A90}
734 The Horsley Drive			
10am	66	81	55
5pm	71	80	58
9pm	63	76	51
1am	53	75	43
School			
10.15am	68	81	56
5.15pm	71	82	59
9.15pm	64	79	50
1.15am	55	61	44
Half way along O'Connell St			
10.30am	55	58	54
5.30pm	56	59	54
9.30pm	47	55	50
1.30am	43	45	40
Cnr Victoria & O'Connell Sts			
10.45am	66	76	58
5.45pm	68	76	59
9.45pm	55	71	54
1.45am	49	65	43

The noise descriptors and noise measurement equipment are described in the appendix.

3.2. Noise Goals

The NSW Government Industrial Noise Policy establishes guidelines for noise goals for residential receivers in terms of external noise levels based on both amenity and intrusiveness.

The amenity goals set an upper limit to the long term L_{Aeq} noise level from all industrial or commercial sources. In this case, the potentially affected residences will be in an area which would be classified as *suburban*. The intrusiveness ($L_{Aeq,15min}$) goals are set at a maximum of 5dBA above the background (L_{A90}) noise level. The project specific noise goals are the lower of the amenity goal and the intrusiveness goal. However, in areas of high traffic noise the amenity goal is adjusted to the existing $L_{Aeq,traffic}$ less 10dBA. These goals are shown in Table 2.

Table 2 Derived Noise Goals $L_{Aeq,15min}$ (dBA) at the houses on The Horsley Drive

	Amenity goal	High traffic amenity goal	Intrusiveness goal	Project specific goal
Daytime (7am-6pm)	55	66-10=56	55+5=60	56
Evening (6pm-10pm)	45	63-10=53	51+5=56	53
Night (10pm-7am)	40	53-10=43	43+5=48	43

For schools the policy sets an internal classroom noise goal of $L_{Aeq,1hr}$ 35-40dBA and for school playgrounds $L_{Aeq,15min}$ 55dBA. For the church the policy sets an internal noise goal of $L_{Aeq,15min}$ 40-45dBA.

These noise goals apply to all noise produced on the site including vehicle movements on site. The assessment is based on an *averaged* noise level over a 15 minute period ($L_{Aeq,15min}$).

4. ASSESSMENT

4.1. Source Noise

Bunnings have provided a report, dated September 2002, containing typical noise levels based on measurements at their Carseldine store in Brisbane. These are summarised below.

Timber saws, typical cut time 2-10sec, average cutting time 22min weekdays and 60min Saturdays. L_{max} 71dBA and $L_{Aeq,15min}$ 62dBA at 4m outside the building assuming 5 minutes of continuous cutting in any 15 minute period.

Unloading using an electric forklift L_{max} 76dBA and $L_{Aeq,15min}$ 65dBA at 8m. This is assumed to be a 15 minute period. Delivery truck departing L_{max} 78dBA at 7m.

Carpark noise L_{max} 69dBA and $L_{Aeq,15min}$ 60dBA at 10m, when busy. Carpark entrance L_{max} 66dBA and $L_{Aeq,15min}$ 53dBA at 8m when busy. When the carpark is less busy the $L_{Aeq,15min}$ noise levels would be correspondingly lower. However, these noise levels are for an open carpark rather than the underground carpark at this site where the noise will be contained.

In addition it is proposed to add tempered-air which will provide cooling only when the ambient temperature exceeds 26°C. The condensers will be roof mounted and consist of four platforms with a total of up to 2 large and 23 smaller condensers.

The carpark will be ventilated by fans which only operate when carbon monoxide levels exceed a preset value. These will exhaust to the roof. Each fan is fitted with a two diameter long attenuator on inlet and discharge.

All equipment will only operate during store hours and will not run at night.

Table 3 shows the above relevant noise levels normalised to a constant 10m distance

Table 3 Source noise levels at 10m (dBA)

Source	$L_{Aeq,15min}$ at 10m	L_{Amax} night only
Delivery truck	56	75
Unloading	62	74
Timber saw	54	-
Car park entrance	51	-
Cars in carpark	60	
Roof condensers	63	-
Carpark ventilation	60	-

4.2. Predicted Noise

Noise from each noise source has been predicted to the closest house at 734 The Horsley Drive and Smithfield Baptist Church and Smithfield Public School. It has also been conservatively assumed that all noise sources can occur simultaneously and therefore the combined noise level is the sum of all the individual noise levels.

The predicted noise levels include the noise control measures and are shown in Tables 4-6.

Table 4 Predicted noise level at 734 The Horsley Drive

Source	$L_{Aeq,15min}$ at 10m	Distance to House	Distance loss	Shielding loss	Predicted noise level
Delivery truck	56	35	11	0	45
Unloading	62	35	11	0	51
Timber saw	54	35	11	0	43
Car park entrance	51	90	19	20	12
Cars in carpark	60	50	14	5	41
Roof condensers	62	95	20	5	38
Carpark ventilation	60	95	20	5	35
Combined L_{Aeq} noise level					**53**

The predicted level of $L_{Aeq,15min}$ 53dBA meets the noise goals for daytime and evening when the store is trading.

Table 5 Predicted noise level at Smithfield Baptist Church

Source	$L_{Aeq,15min}$ at 10m	Distance to House	Distance loss	Shielding loss	Predicted noise level
Delivery truck	56	125	22	10	24
Unloading	62	125	22	10	30
Timber saw	54	100	20	0	34
Car park entrance	51	90	19	0	32
Cars in carpark	60	100	20	5	35
Roof condensers	62	140	23	5	34
Carpark ventilation	60	140	23	5	32
Combined L_{Aeq} noise level					**41**

The predicted noise level of $L_{Aeq,15min}$ 41dBA is an external noise level so the internal noise goal of 40dBA will be met.

Table 6 Predicted noise level at Smithfield Public School playground

Source	$L_{Aeq,15min}$ at 10m	Distance to House	Distance loss	Shielding loss	Predicted noise level
Delivery truck	56	125	22	5	29
Unloading	62	125	22	10	30
Timber saw	54	75	18	0	37
Car park entrance	51	70	17	0	34
Cars in carpark	60	75	18	5	37
Roof condensers	62	110	21	5	36
Carpark ventilation	60	110	21	5	34
Combined L_{Aeq} noise level					**48**

The predicted noise level of $L_{Aeq,15min}$ 48dBA in the playground meets the playground noise goal and will meet the internal classroom noise goal.

5. GENERATED TRAFFIC NOISE

5.1. Traffic Noise Criteria

The Environmental Criteria for Road Traffic Noise establishes noise criteria for land use developments with potential to create additional traffic. The actual criteria depend upon the type of road.

The Horsley Drive would be considered as a *sub-arterial* road. *For land use developments with potential to create additional traffic on existing sub-arterial roads the noise goals at the building facade are:*

> *$L_{Aeq,15hr}$ (daytime 7am-10pm) 60dBA*
> *In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2dB.*

The existing L_{Aeq} from traffic noise already exceeds the goal of so the 2dBA noise increase goal applies.

5.2. Traffic Noise Assessment

A traffic assessment has not yet been undertaken. However, as these are already busy roads it is unlikely that traffic noise will increase significantly.

6. SUMMARY

It is proposed to develop a Bunnings store on the corner of The Horsley Drive, O'Connell and Victoria Streets, Smithfield. The site faces O'Connell Street and runs between The Horsley Drive and Victoria Street in Smithfield. No 727 The Horsley Drive is currently vacant and has most recently been used as Automatic Transmission Specialists and car park. No 73 Victoria Street is occupied by a 1-2 storey industrial building used for smash repairs. The proposal is for a car park with warehouse above.

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Carpark access will be from O'Connell Street. Delivery vehicle access is off Victoria Street and they will leave the site via The Horsley Drive.

Store operating times are expected to be 7am to 9pm Monday to Friday and 8am to 6pm on weekends and public holidays. Deliveries will be between 7am and 10pm. Night filling may occur outside of normal store trading hours.

Existing noise levels have been measured and appropriate noise goals have been derived based on published NSW Government guidelines.

Noise levels measured at another Bunnings store have been used to predict noise to nearby houses.

The predicted levels meet all the daytime and evening noise goals at the houses and in the church and in the school.

A traffic assessment has not yet been undertaken. However, as these are already busy roads it is unlikely that traffic noise will increase significantly.

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APPENDIX - NOISE MEASUREMENT AND DESCRIPTORS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are shown in the graph below, are defined here.

Sound Level Meter. A Rion integrating sound level meter conforming to Australian Standard 1259 was used. The calibration was checked before and after the measurement periods. No system drift was recorded which indicates that the sound level meter worked correctly.

Maximum Noise Level (L_{Amax}). The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{Aeq}. The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

L_{A90}. The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.