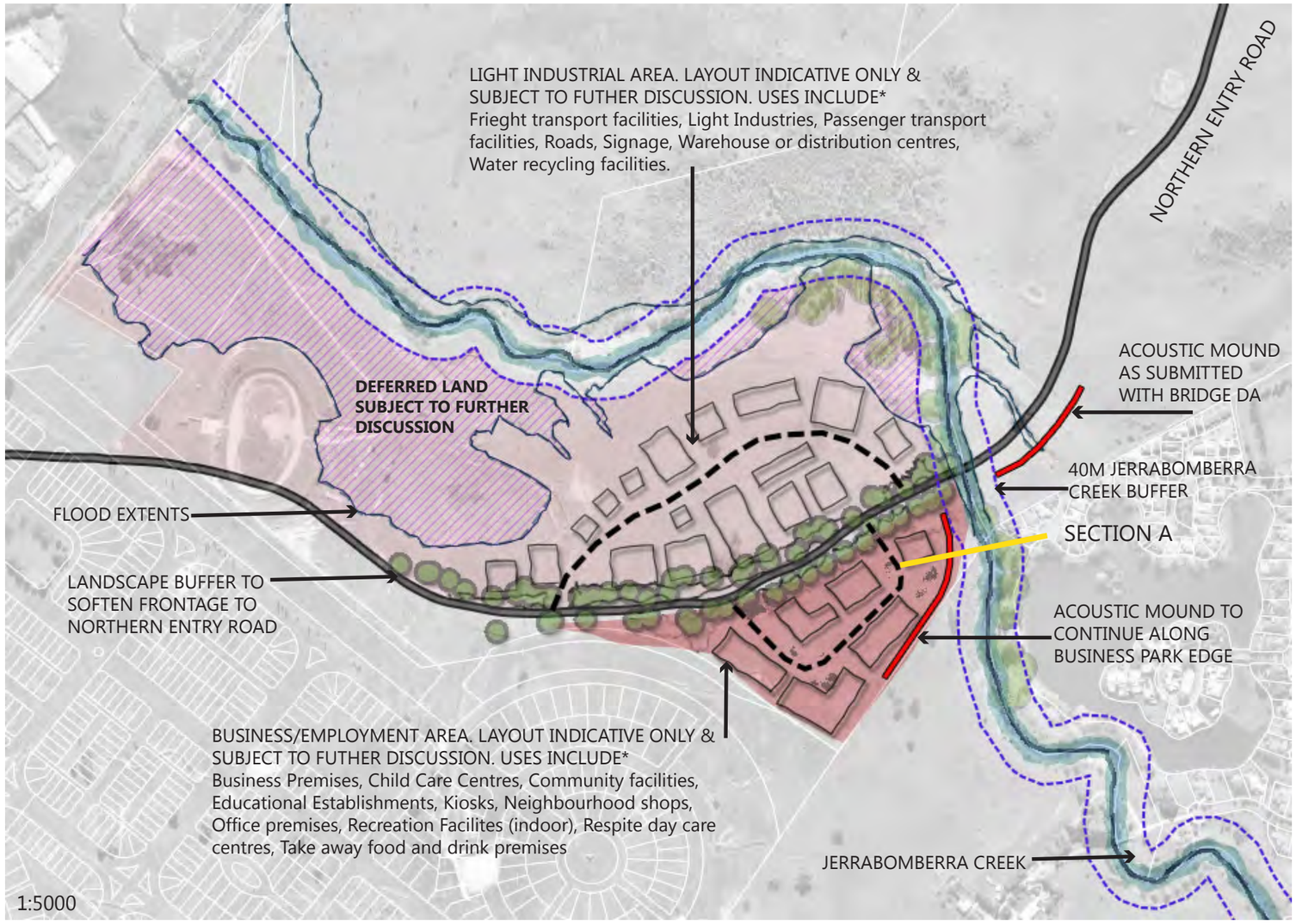
appendix a

The Village Building Company –
Concept Plan



* AS SPECIFIED IN THE QLEP (POPLARS) 2013

LIGHT INDUSTRIAL AREA

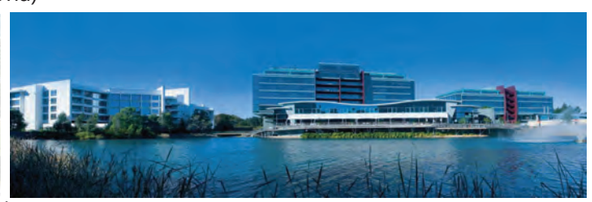
The light industrial area will cover approximately 11ha. Uses within this area will largely consist of warehouses and distribution businesses as well as office space. The light industrial area will sit inbetween the proposed Northern Entry Road and the Jerrabomberra Creek flood line.

BUSINESS/EMPLOYMENT AREA

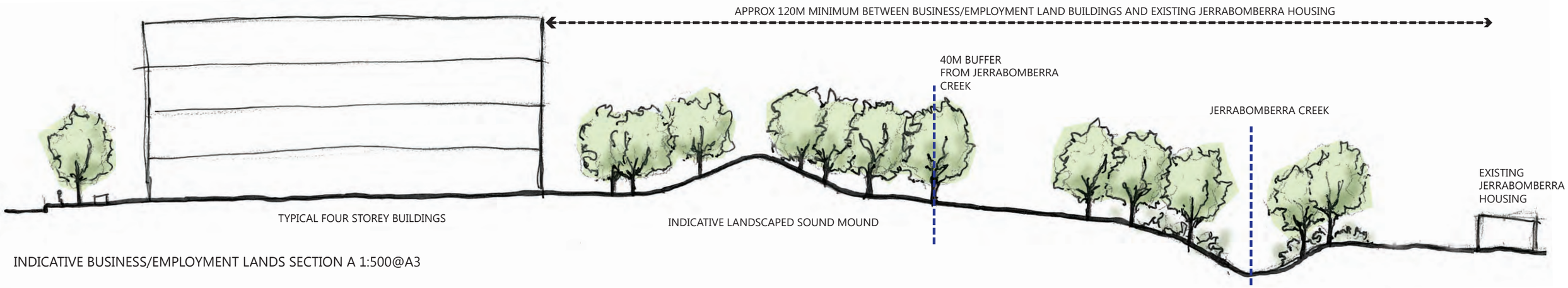
An area of approx 6ha, this would incoporate business/office type uses. Typical buildings would be four storeys, connected by landscaped areas. The Business/Employment area will sit between the proposed Northern Entry Road and North Tralee Boundary. Similar, though slightly larger examples are shown below;

Innovation Campus, Wollongong (14ha)

Brindabella Business Park (19ha)



Norwest Business Park (16ha)



INDICATIVE BUSINESS/EMPLOYMENT LANDS SECTION A 1:500@A3

North Tralee

Concept Plan

534697.01_001_Sheet_1
14/04/15 A

SCALE AS SHOWN

The Village Building Co.

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E. planning.act@au.knightfrank.com

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Knight Frank TOWN PLANNING

appendix b

Wilkinson Murray- North Tralee development – Industrial Noise Assessment

WILKINSON MURRAY

13 April 2014

WM Project Number: 02147-DA
Our Ref: TM 130414 IndBC
Email: tmainment@villagebuilding.com.au

Tom Maidment
The Village Building Co. Limited
7 / 92 Hoskins Street
P.O. Box 178 Mitchell ACT 2911

Dear Tom

Re: North Tralee Development - Industrial Noise Assessment

Wilkinson Murray has conducted a review of the noise assessment prepared by Renzo Tonin Associates (RTA) for Queanbeyan Council in relation to potential future noise impact associated with North Tralee titled:

NORTH TRALEE, QUEANBEYAN ENVIRONMENTAL NOISE IMPACT ASSESSMENT FOR LOCAL ENVIRONMENTAL STUDY REPORT TE408-01F02 (REV 2) NOISE ASSESSMENT.DOC DATED 17 OCTOBER 2011.

In particular, we have reviewed the assessment of future industrial noise on residences in Jerrabomberra with the view of minimising the buffer between residences whilst at the same time protecting the acoustic amenity of these residences.

Renzo Tonin Associates Assessment

The RTA assessment has established the following site specific intrusive (L_{Aeq}) noise criteria at Jerrabomberra residences.

- Day 41 dBA
- Evening 39 dBA
- Night 35 dBA

Subsequent to this, noise modelling has been conducted by RTA based on a scenario of light and heavy industry being located on the North Tralee site with a 350 metre buffer between residences. The assessment was conducted based on neutral and adverse weather conditions and determined the following:

- Noise screens / walls should be considered in the design phase of any industrial premise to be located within the North Tralee site. The noise screens / wall can form part of boundary fences and should be designed to and located so that the screen / wall provides sufficient noise attenuation to reduce noise impacts to neighbouring residential areas.
- Consideration should be given to building layout design at the design stage of an industrial development to ensure that noisy activities are located away from residential areas. For example, loading docks and driveways should be located towards the western side of the site

and the building located to the eastern side so that the building provides noise shielding of noisy activities to the affected residential areas.

It is noted that that the assessment scenarios were, not unreasonably, based on unrestricted industrial use on the site. Hence the finding of potential noise impact at residences in Jerrabomberra.

It is noted that the report also presents existing industrial noise levels of the Hume Industrial estate which are significantly lower than the predictions in Scenarios 1 and 2 of the RTA report. Therefore if the industrial uses on the North Tralee site were limited to similar uses to the Hume Industrial Site it follows that potential noise impact would be also be lower and the buffer between the North Tralee and residences may be reduced.

Noise Modelling

Wilkinson Murray has conducted preliminary noise modelling of the North Tralee site based on current noise emissions from the Hume site. Industrial area sources were modelled in Cadna A software to determine a source sound power level that replicates the levels presented in the RTA report.

Having calibrated the model noise levels to the Hume Industrial Area a number of "industrial noise source of the same magnitude were modelled. Resultant noise levels at residences were predicted at two nearest residences being immediately to the east and to the south east of North Tralee.

Indicative industrial noise levels at these residences are presented in the following Table 1:

Table 1 Predicted Noise Levels at Residences.

Receiver	Predicted $L_{Aeq\ (15\ minute)}$ noise level - dBA		Intrusive Noise Criteria
	Neutral Conditions	Temperature Inversion	Day / Evening / Night
Eastern Residences	42	44	41 / 39 /35
South Eastern Residences	39	41	41 / 39 /35

Figures 1 and 2 attached show the noise plots of the modelling.

Discussion and Recommendations

A review of the results indicates that, should the Industrial Use of North Tralee be similar to the Hume Industrial Area, resultant noise levels at Jerrabomberra will be much lower. In such a case the buffer between the residences and North Tralee and residences could be reduced to around 100 metres.

An exceedance of up to 7 dBA would occur if no noise mitigation were incorporate into the design of the estate and all facilities operated on a 24 hour basis. Therefore management and mitigations measures would be required, consistent with the measures in the RTA report.

Therefore, as a result of our review, it is feasible to reduce the noise buffer between residences and the North Tralee site provided similar industrial uses to Hume are allowed on the site. In addition mitigation measures will be required to future operations that should be incorporated into a plan of management.

These findings could be submitted to Council for consideration to council for their review and assessment based on the usage scenario detailed in this review.

Conclusion

A review of the potential impact of industrial noise from North Tralee has been conducted based on restricting the industrial uses on the site. Based on restricting the uses to those similar to the Hume Indusial Estate, it is considered that a smaller buffer is acoustically feasible provide management and mitigation consitent with the RTA assessment are adopted.

These finding could be submitted to council for their consideration.

We trust this meets you needs. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

Brian Clarke
Senior Associate

Figure 1 Noise Contours (Neutral Conditions)

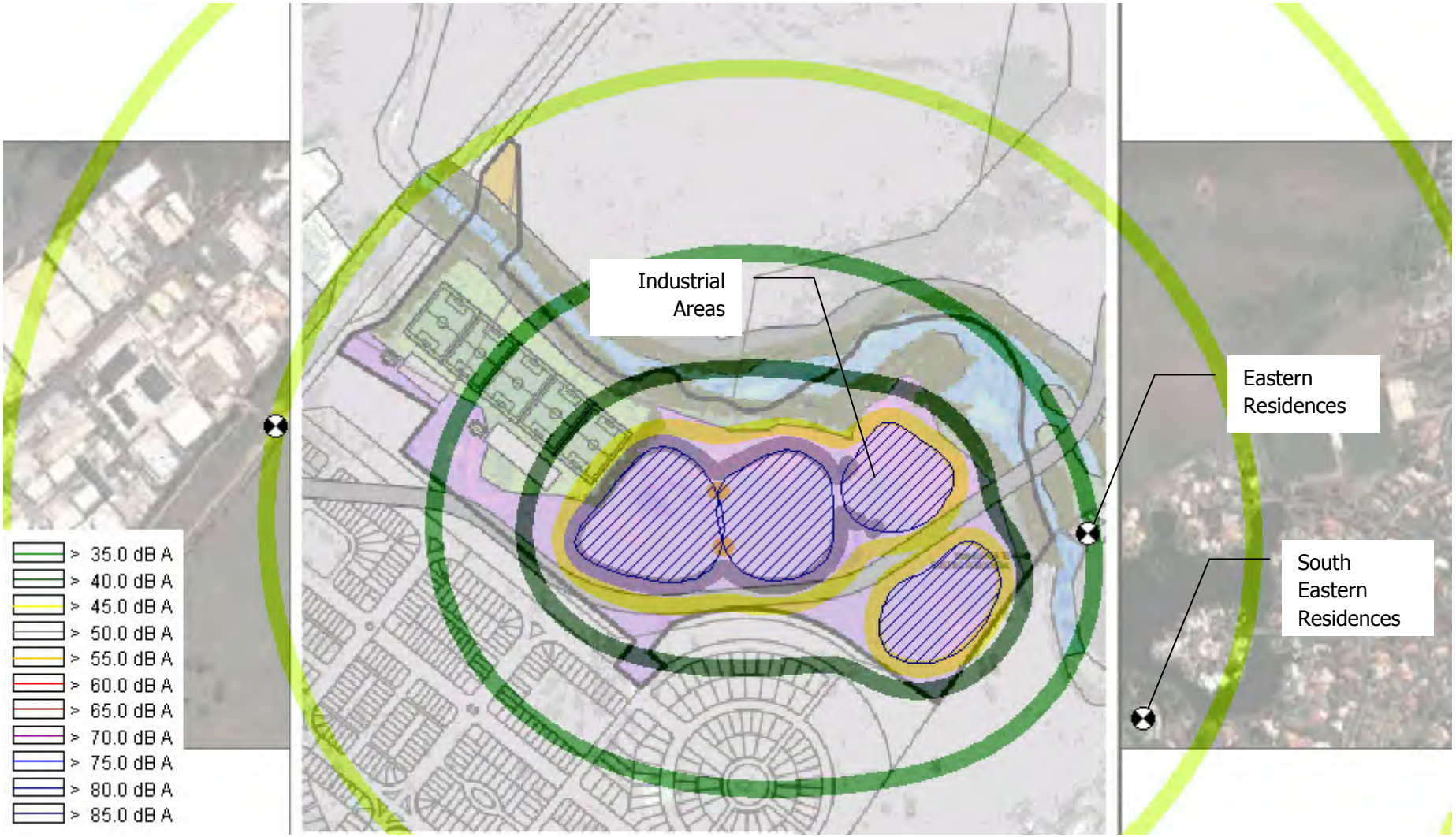
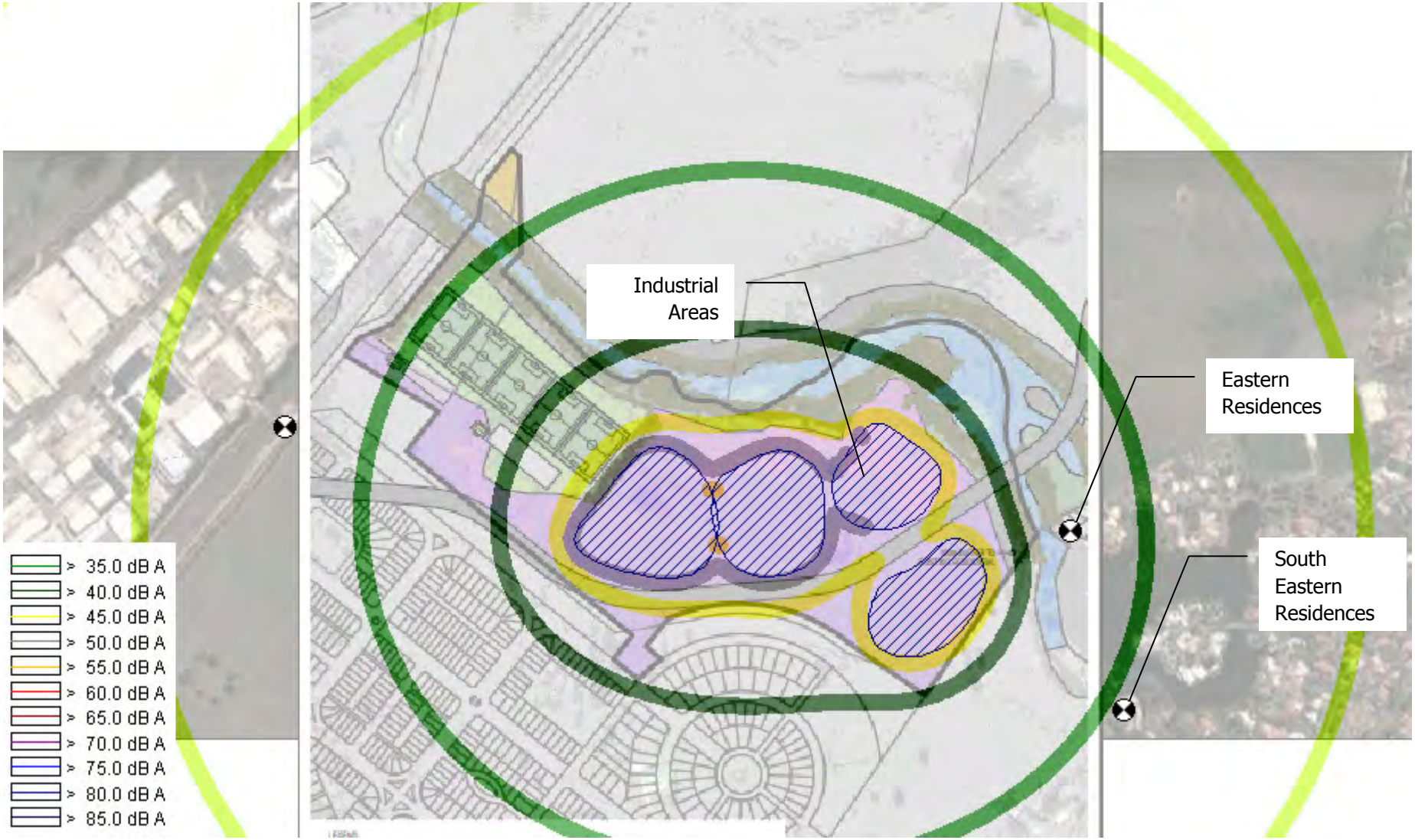


Figure 2 Noise Contours (Inversion Conditions)



appendix c

Wilkinson Murray Acoustic Assessment – Proposed Bridge Works, South Jerrabomberra

APPENDIX 9

ACOUSTIC ASSESSMENT

Proposed Bridge Works, South Jerrabomberra

May 2014

Under instruction from

Canberra Estates Consortium No. 4

For the purpose of

Development Application (Stage 1 of the Northern Entry Road - Proposed Bridge Works)

11 September 2013

WM Project Number: 02147-DA
Our Ref: DC 110913 bcRoad
Email: dcollings@villagebuilding.com.au

Daniel Collings
CEC4
7 / 92 Hoskins Street
P.O. Box 178 Mitchell ACT 2911

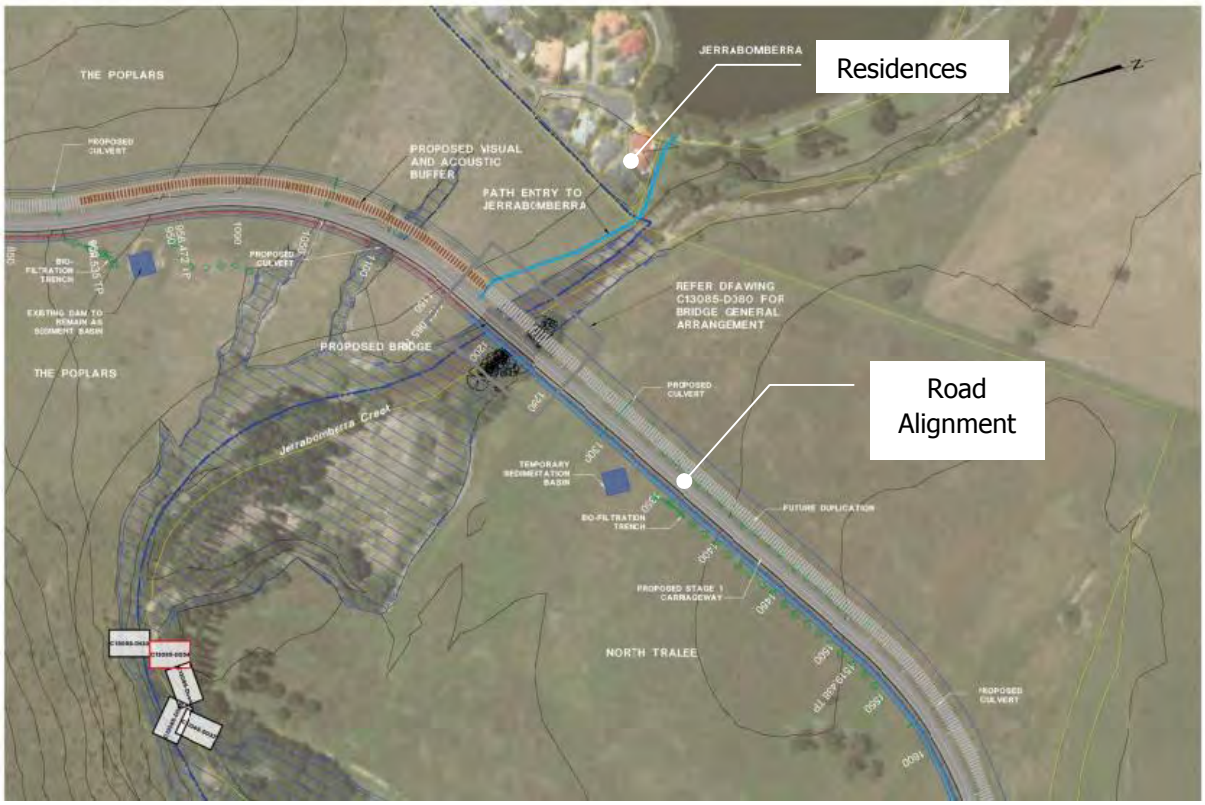
Dear Daniel

Re: Tralee Development - Northern Road Traffic Noise Assessment

Wilkinson Murray has conducted a traffic noise assessment associated with the proposed Northern Access Road to South Tralee. The assessment relates to noise associated with projected future traffic flows, provided by the Traffic Consultant Arup, on residences in Jerrabomberra.

Figure 1 show the proposed road location and the nearest residences.

Figure 1 Proposed Road Alignment and Residences in Jerrabomberra



TRAFFIC NOISE CRITERIA

Noise Criteria for assessment of road traffic noise are set out in the NSW Government's *NSW Road Noise Policy (RNP)*. Table 1 sets out the assessment criteria for residences to be applied to particular types of project, road category and land use.

Table 1 Traffic Noise Criteria extracted from the NSW *RNP*

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	$L_{Aeq,\ (15\ hour)}$ 55 (external)	$L_{Aeq,\ (9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from **redevelopment** of existing freeway/arterial/sub-arterial roads	$L_{Aeq,\ (15\ hour)}$ 60 (external)	$L_{Aeq,\ (9\ hour)}$ 55 (external)
	3. Existing residences affected by **additional traffic** on existing freeways/arterial/sub-arterial roads generated by land use developments		
Local roads	4. Existing residences affected by noise from **new** local road corridors	$L_{Aeq,\ (1\ hour)}$ 55 (external)	$L_{Aeq,\ (1\ hour)}$ 50 (external)
	5. Existing residences affected by noise from **redevelopment** of existing local roads		
	6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments		

In summary the noise assessment criteria at the Jerrabomberra residential receivers based on the *RNP* are:

- $L_{Aeq,1hr}$ day 55dBA; and
- $L_{Aeq,1hr}$ night 50dBA

PREDIEDIECTED TRAFFIC NOISE LEVELS

The noise level contribution of future vehicle movements along the northern access road has been predicted using the *Calculation of Road Traffic Noise (CORTN)* traffic noise prediction technique.

The predicted noise levels are based on the following information:

- Distance from the road to residences Approximately 120 m.
- Topography No barriers.
- Angle of View 160 degrees.
- Facade Reflection 2.5 dBA.
- Road Surface Open Grade Asphalt.
- Average Vehicle Speed 80 km/hr.

Traffic flow data for the year 2031 has been provided by Arups as follows:

- Daytime Traffic ($_{15hr}$) 15,300 vehicles (5% heavy Vehicles)
- Night Traffic ($_{9\ hrs}$) 1,700 vehicles (5.8% heavy Vehicles)

It is noted that the percentage heavy vehicles has been estimated by Aurps for the purpose of traffic noise calculations.

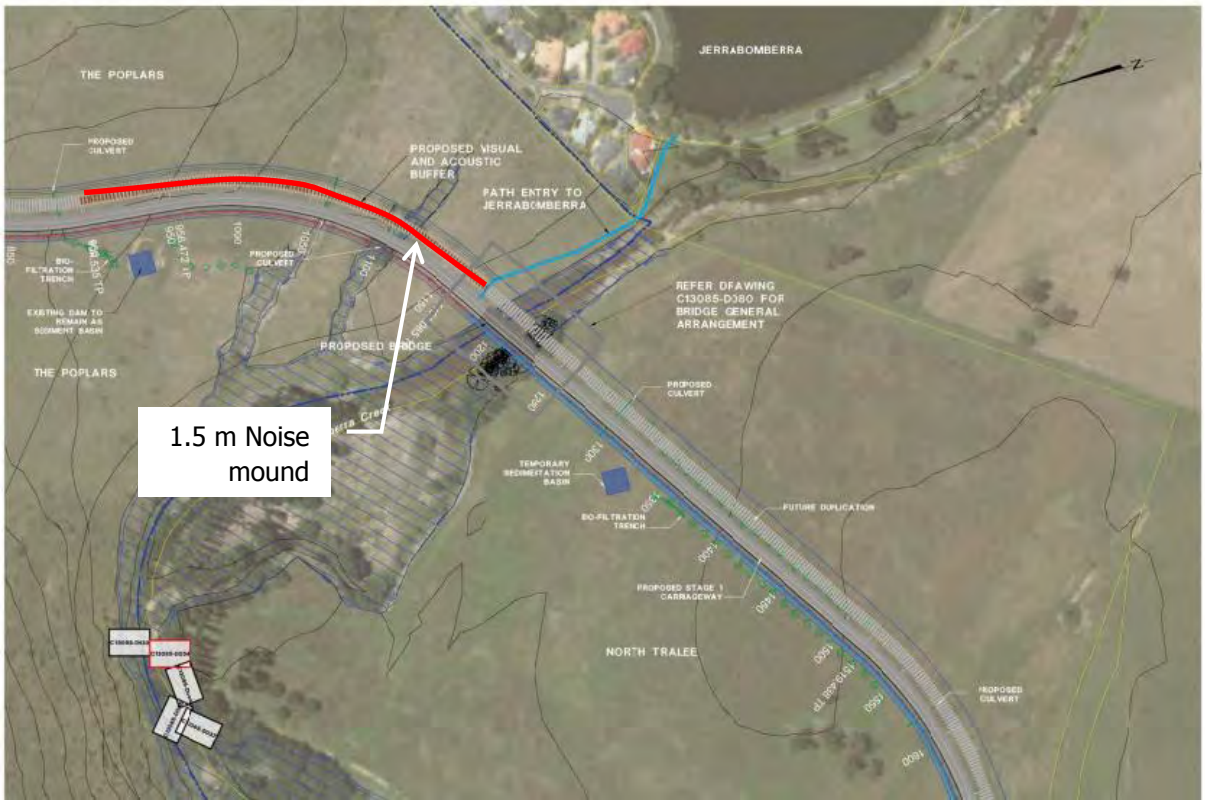
Table 2 details predicted future traffic noise levels due the above traffic movements.

Table 2 Predicted Traffic Noise Levels at Residences - $L_{Aeq,period}$ – dBA

Period	Traffic Noise Levels	Noise Criteria	Exceedance
Daytime (7am – 10 pm)	57.8	55	2.8
Night (10 pm-7 am)	50.6	50	0.6

A review of the noise predictions indicates that a maximum exceedance of 2.8 dBA is predicted at residences in the day period. Accordingly a roadside noise mound is recommended to be in the order of 1.5 metres high as shown in the Figure 2 below. It assumed that a Jersey kerb is installed on the bridge across Jerrabomberra Creek

Figure 2 Location of Noise Mound



Traffic noise levels with the roadside noise mound are presented in Table 3

Table 3 Predicted Traffic Noise Levels at Residences - $L_{Aeq,period}$ – dBA with Noise Mound

Period	Traffic Noise Levels	Noise Criteria	Exceedance
Daytime (7am – 10 pm)	54.9	55	0
Night (10 pm-7 am)	48.8	50	0

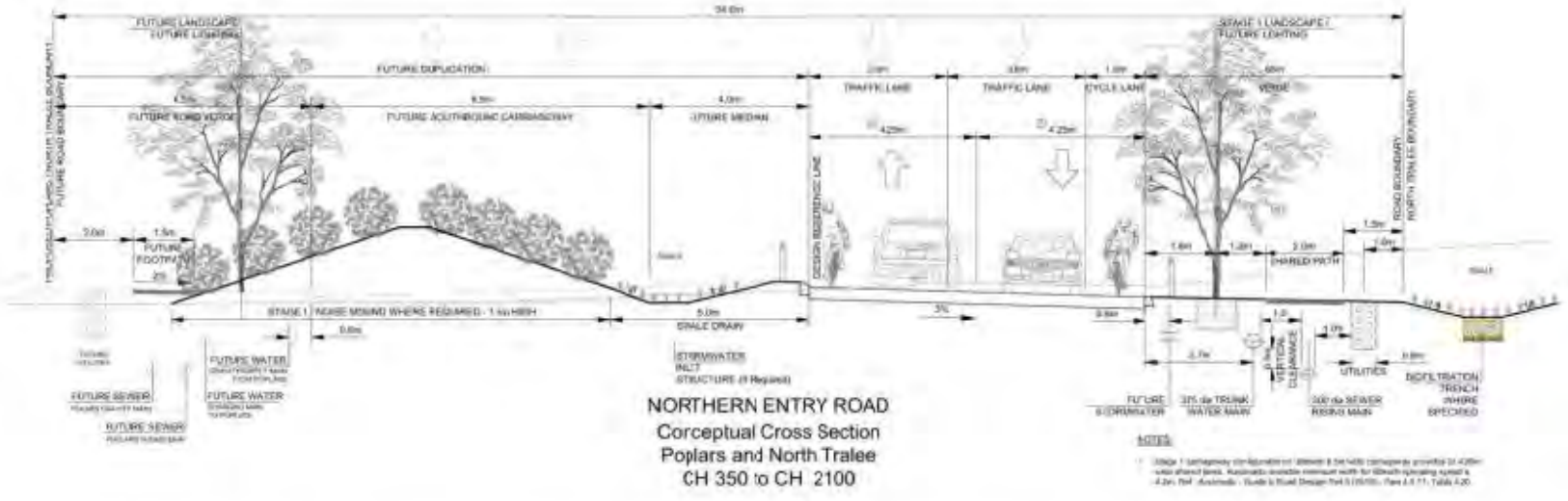
It is noted that the installation of a 1.5 m roadside mound as indicated in Figure 2 will result in compliance with RMS noise objectives

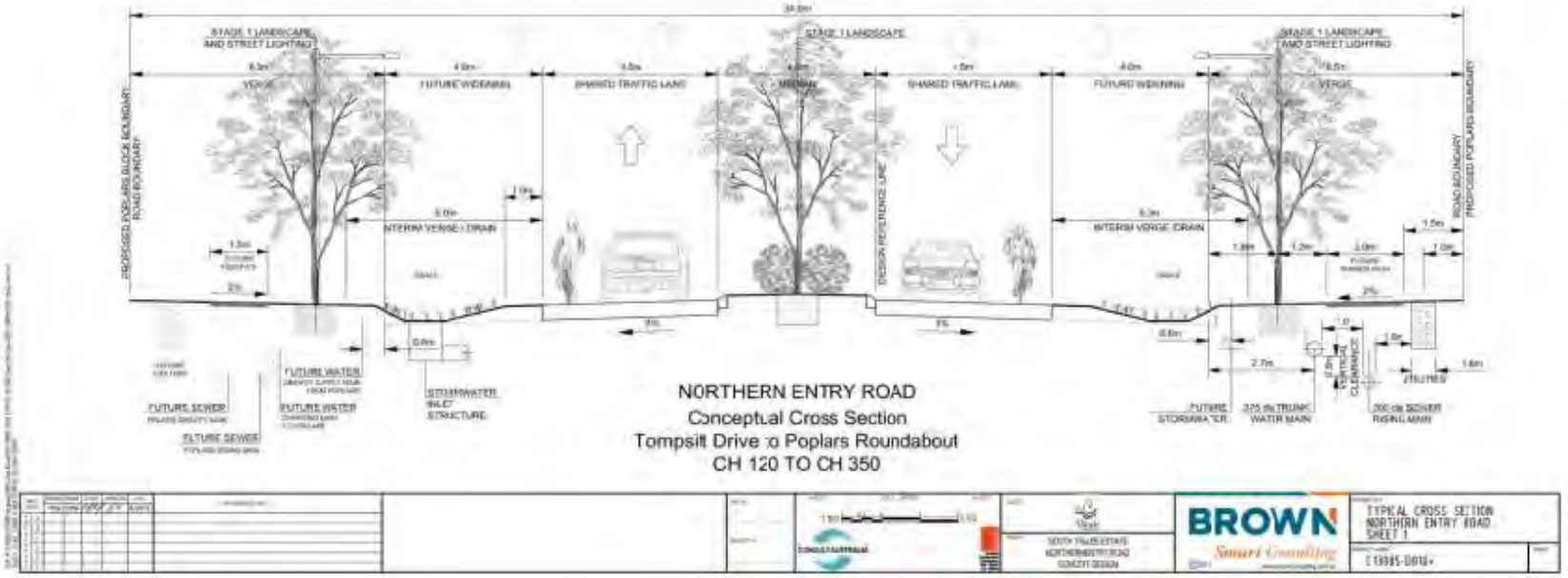
These measures have been adopted in current drawings as illustrated in the attached drawing/

We trust this meets you needs. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

Brian Clarke
Senior Associate


NORTHERN ENTRY ROAD
Corceptual Cross Section
Poplars and North Tralee
CH 350 to CH 2100


NORTHERN ENTRY ROAD
Conceptual Cross Section
Tompsit Drive :o Poplars Roundabout
CH 120 TO CH 350
BROWN
Smart Consulting
TYPICAL CROSS SECTION
NORTHRN ENTRY ROAD
SHEET 1

appendix d

Renzo Tonin & Associates(July 2014) North Tralee, Queanbeyan – Remodelling and Assessment for proposed Buffer Zone

22 July 2014
TG876-01F02 (rev 1) Report.docx

Queanbeyan City Council
Ms Beate Jansen
Beate.Jansen@qcc.nsw.gov.au

From: William Chan [WChan@renzotonin.com.au]

North Tralee, Queanbeyan - Remodelling and Assessment for Proposed Buffer Zone

1 Introduction

Renzo Tonin & Associates was engaged to remodel and reassess potential noise impacts from the modification of the proposed North Tralee employment precinct concept plan. In particular, the applicable acoustic buffer zone to the adjoining Jerrabomberra residential area to the east of the site is to be determined based on the revised concept plan.

2 Project Description

Renzo Tonin & Associates undertook an environmental noise impact assessment as part of the Local Environmental Study (LES) for the North Tralee land release area and results of the assessment was presented in a previous report [Ref: TE408-01F02 (rev 2), dates 17th September 2010]. The proposed North Tralee employment precinct concept plan has since been modified and as a result the applicable acoustic buffer zone to the adjoining Jerrabomberra residential area to the east of the site needs to be determined.

Furthermore, as part of the modified concept plan a new northern entry road has been proposed and potential traffic noise from this proposed road is to be assessed and noise impacts taken into account when determining the applicable acoustic buffer zone.

Figure 1 shows the modified precinct concept plan.

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Sydney Melbourne Brisbane Kuwait

Figure 01
North Tralee employment area

Project:
TG876-01 North Tralee

Date: 22-07-2014
Ref: TG876-01-P01 (r0)
Scale: NTS

3 Noise Criteria

The assessment procedure in terms of the NSW Environmental Protection Authority's (EPA) 'Industrial Noise Policy' (INP), applied by Queanbeyan City Council, has two components:

- Controlling intrusive noise impacts in the short term for residences
- Maintaining noise level amenity for particular land uses for residences and other land uses.

In the previous noise assessment report the relevant intrusiveness and amenity criteria were established for the residential areas in Jerrabomberra. The applicable intrusiveness and amenity criteria for the residential areas in Jerrabomberra are reproduced in Table 3.1 and Table 3.2 below.

Table 3.1 – Intrusiveness Criteria at residential areas in Jerrabomberra

Assessment Location	Intrusiveness Criteria, dB(A)		
	Day	Evening	Night
Residential areas in Jerrabomberra	≤ 36 + 5 = **41**	≤ 34 + 5 = **39**	≤ 30 + 5 = **35**

Notes: 1. Day refers to 7am to 6pm, Monday to Saturday; and 8am to 6pm, Sundays and Public Holidays
2. Evening refers to 6pm to 10pm
3. Night refers to 10pm to 7am, Monday to Saturday; and 10pm to 8am, Sundays and Public Holidays

Table 3.2 – Amenity Criteria for residential areas in Jerrabomberra

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level, dB(A)	
			Acceptable	Recommended Maximum
Residential areas in Jerrabomberra	Suburban	Day	55	60
		Evening	45	50
		Night	40	45

4 Noise Assessment

4.1 Noise Sources

The employment precinct of the North Tralee site is to be zoned 'B7', where the permitted uses comprise of business premises, child care centres, community facilities, educational establishments, freight transport facilities, kiosks, light industries, neighbourhood shops, office premises, recreation facilities (indoor), passenger transport facilities, respite day care centres, roads, signage, take-away food and drink premises, telecommunications facilities, warehouse or distribution centres and water recycling facilities.

The permitted uses nominated above have been grouped into four categories as follows:

- **Community Centres** – Community facilities, recreation facilities (indoor), etc.
- **Educational Facilities** – Child care centres, educational establishments, respite day care centres, etc.
- **Light Industry** – Business premises, kiosks, light industries, neighbourhood shops, office premises, take-away food and drink premises, telecommunications facilities, water recycling facilities, etc.
- **Heavy Industry** – Freight transport facilities, warehouse or distribution centres, etc.

In the course of our work for previous projects, we have conducted noise measurements of typical activities and these results are held in our office library files and databases. Table 4.1 below presents typical noise source levels generated by different types of premises expected at the proposed site, for typical uses and operation of typical equipment. These noise levels are used for noise predictions.

Table 4.1 – Sound Power Levels for Different Types of Premises

Noise Source	Sound Power Level, dB(A)	
	L_{eq}	L_1
Community Centres (per centre)	76	79
Educational Facilities (per facility)	85	88
Light Industry (per premise)	102	105
Heavy Industry (per premise)	115	118

Source: Renzo Tonin & Associates past project files & database.

For the purpose of the noise assessment, it has been assumed that heavy industries will be located on the western side of the employment area, while light industries will be located in the centre of the site and community centres and educational facilities will be located to the eastern side of the employment area. For the day time scenario it is assumed that all the industries and facilities will be operating concurrently and for the evening and night time scenarios it is assumed that only heavy industries will be operating. As the same sources are assumed to be operating for the evening and night time scenarios and the night time criteria are more stringent than the evening criteria, only the night time period would be assessed.

4.2 Noise Predictions

Noise emissions from the operation of the employment areas were modelled using the industrial module in the SoundPLAN computer program. The noise model accounts for the noise sources; receiver locations; distances and topographical features between sources and receivers. SoundPLAN calculates the contribution of each noise source at nominated receivers and allows for the prediction of the total noise from a site. The computer program is endorsed by the EPA and its environmental noise predictions have been verified on many past occasions in the field.

Potential increase in noise levels resulting from adverse meteorological conditions have also been considered and computed as per the requirements of the NSW INP.

Noise predictions were prepared for each of the following meteorological conditions:

1. Calm & isothermal conditions (acoustically neutral) – no wind and no temperature inversion
2. Slight to gentle breeze – 3m/s wind velocity at 10m from ground level between each noise source and each noise receiver (as per INP default wind conditions). Wind direction was based on wind travelling from the source to the receiver.
3. Moderate temperature inversion – 3 degrees Celsius per 100m temperature gradient or 'F-Class' Pasquill stability category (as per INP's default temperature inversion conditions for non-arid areas where more site specific data are unavailable)

Through the use of the SoundPLAN computer program and based on the above meteorological conditions, industrial noise contour plots have been prepared. The noise contour plots for industrial noise from the North Tralee site impacting neighbours, in particular the Jerrabomberra residential area, are shown in Figures 2 and 3 for the day time scenario, for calm and adverse wind conditions, respectively. Figures 4, 5 and 6 present the noise contour plots for the night time scenario, for all three meteorological conditions (ie. calm, adverse winds and temperature inversions).

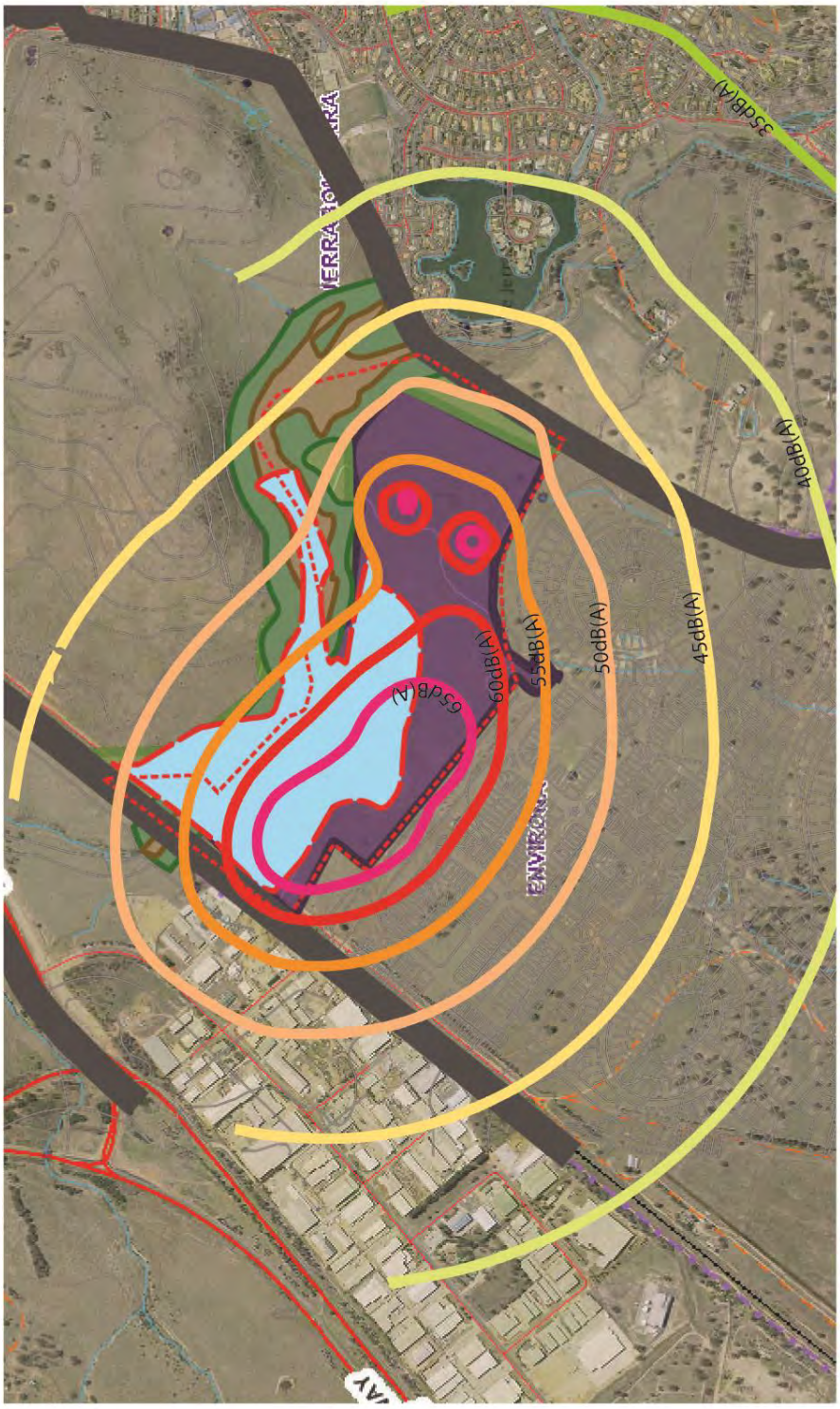

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Figure 02
North Tralee employment area - Day - Calm and Isothermal Conditions

Project: TG876-01 North Tralee

Date: 22-07-2014

Ref: TG876-01-P02 (r0)

Scale: NTS

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Figure 03
North Tralee employment area - Day - Adverse Wind Conditions

Project:
TG876-01 North Tralee

Date:	Ref:	Scale:
22-07-2014	TG876-01-P03 (r0)	NTS

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Sydney Melbourne Brisbane Kuwait

Figure 04
North Tralee employment area - Night - Calm and Isothermal Conditions

Project:
TG876-01 North Tralee

Date: 22-07-2014
Ref: TG876-01-P04 (r0)
Scale: NTS

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Sydney Melbourne Brisbane Kuwait

Figure 05
North Tralee employment area - Night - Adverse Wind Conditions

Project:
TG876-01 North Tralee

Date:	Ref:	Scale:
22-07-2014	TG876-01-P05 (r0)	NTS

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Sydney Melbourne Brisbane Kuwait

Figure 06
North Tralee employment area - Night - Temperature Inversion

Project:
TG876-01 North Tralee

Date:	Ref:	Scale:
22-07-2014	TG876-01-P06 (r0)	NTS

From the noise contour plots it can be seen that noise from the North Tralee site will exceed the INP's intrusiveness and amenity noise criteria, during both the day and night time periods, for the residential areas in Jerrabomberra.

4.3 Recommendations

The following recommendations provide in-principle noise control solutions to reduce noise impacts to residential areas in Jerrabomberra. This information is presented for the purpose of the decision making and cost planning process only. The assistance of an acoustic consultant must be sought at the detailed design phase of the project to provide more accurate design advice when there is more detailed information about building type, lot arrangement and traffic flow information available.

The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

- Noise screens / walls should be considered in the design phase of any industrial premise to be located within the North Tralee site. The noise screens / wall can form part of boundary fences and should be designed to and located so that the screen / wall provides sufficient noise attenuation to reduce noise impacts to neighbouring residential areas.
- Consideration should be given to building layout design at the design stage of an industrial development to ensure that noisy activities are located away from residential areas. For example, loading docks and driveways should be located towards the western side of the site and the building located to the eastern side so that the building provides noise shielding of noisy activities to the affected residential areas.
- No premises are to be built outside of the employment area shown in the concept plan. The placement of community centres, educational facilities, light industrial and heavy industrial facilities should be limited to the areas designated in Figure 7.

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Acoustics, Vibration & Structural Dynamics
Sydney Melbourne Brisbane Kuwait

Figure 07
North Tralee recommended employment area usage

Project:
TG876-01 North Tralee

Date:	Ref:	Scale:
22-07-2014	TG876-01-P07 (r0)	NTS

4.4 Comparison with Wilkinson Murray Report

An acoustic review on the previous Renzo Tonin and Associates report was conducted by Wilkinson Murray, for Village Building Co. Ltd (Ref. TM 130414 IndBC, dated 13 April 2014). In the Wilkinson Murray review, the noise source adopted in the modelling of the North Tralee site was based on similar noise source levels used in the previous Renzo Tonin & Associates assessment for the Hume Industrial Area with the assumption that the future industrial use of North Tralee would be similar to the existing Hume Industrial Area.

The review noted that Renzo Tonin and Associates' assessment scenarios were "*not unreasonably based on unrestricted industrial use on the site*" and "*if the industrial uses on the North Tralee site were limited to similar uses to the Hume Industrial Site it follows that potential noise impact would also be lower*".

As the future zoning of the North Tralee site would allow for the use of community centres, educational facilities, light industries and heavy industries, the noise levels presented in the above noise contour plots indicate the worst case outcome with appropriate location of industrial noise sources on the North Tralee site and no comparison can be drawn to the Wilkinson Murray Review.

5 Review of Traffic Noise Level on Northern Entry Road

As part of the modified concept plan a new northern entry road has been proposed. Wilkinson Murray prepared a traffic noise assessment report (Ref: DC 110913 bcRoad, dated 11 September 2013) for the proposed new northern entry road.

A review of the Wilkinson Murray report indicates that the assessment was based on the NSW Road Noise Policy (RNP) criteria for local roads; traffic noise prediction using the Calculation of Road Traffic Noise (CoRTN) algorithms; and traffic flow data for the year 2031 provided by Arups.

Based on the calculation inputs and methodology presented in the Wilkinson Murray report, Renzo Tonin & Associates confirm that the predicted traffic noise levels and the recommendations of a 1.5m high barrier on the northern edge of the new northern entry road plus a Jersey kerb on the bridge across Jerrabomberra Creek, will be sufficient in achieving the nominated RNP noise criteria at the nearest affected residences in Jerrabomberra residential area.

6 Conclusion

Renzo Tonin & Associates have remodelled and reassessed potential noise impacts from the modification to the proposed North Tralee employment precinct concept plan to the adjoining Jerrabomberra residential area.

Noise impacts from proposed future employment uses have been quantified and the results were compared to the noise criteria nominated in the previous noise assessment prepared by Renzo Tonin &

Associates. Recommendations have been provided to reduce noise impacts at the nearby Jerrabomberra residential area.

Review of the potential traffic noise impacts from the proposed new northern entry road has been assessed and the proposed noise barrier and Jersey kerb recommended by Wilkinson Murray were found to be sufficient

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
21.07.2014	Generate report	0	1	WC	MCH	MCH

The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

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APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.