

# UTS THOMAS ST BUILDING NOISE IMPACT ASSESSMENT

TF557-01F03 (REV 4) NOISE IMPACT ASSESSMENT

13 DECEMBER 2011

Prepared for:

University of Technology, Sydney

City Campus

Level 6, Building 10

235 Jones Street



## DOCUMENT CONTROL

Date	Revision History	Non-Issued Revision	Issued Revision	Prepared By (initials)	Instructed By (initials)	Reviewed & Authorised by (initials)
1 Dec 2011	Draft Report	0		RO	NT	
2 Dec 2011	Reviewed draft Report	1				MCh
2 Dec 2011	Revised draft Report	2		RO		
5 Dec 2011	Issue draft report for review and comments		3			NT
13 Dec 2011	Revised Report	4		RO		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.*

*This document is issued subject to review and authorisation by the Team Leader noted by the initials printed in the last column above. If no initials appear, this document shall be considered as preliminary or draft only and no reliance shall be placed upon it other than for information to be verified later.*

*This document is prepared for our Client's particular requirements which are based on a specific brief with limitations as agreed to with the Client. It is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party without prior consent provided by Renzo Tonin & Associates. The information herein should not be reproduced, presented or reviewed except in full. Prior to passing on to a third party, the Client is to fully inform the third party of the specific brief and limitations associated with the commission.*

*The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.*

## CONTENTS

1	INTRODUCTION	4
2	EXECUTIVE SUMMARY	5
3	PROJECT DESCRIPTION	6
	3.1 Location	6
	3.2 Noise Sources from the Proposed Development following Occupancy	6
	3.2.1 Summary of Noise Sources that will have impact inside the proposed Building	6
	3.2.2 Summary of Noise Sources that will have impact on neighbouring buildings and properties	6
	3.2.3 Noise Sources that will have impact onto the proposed development	6
4	EXISTING ACOUSTIC ENVIRONMENT	7
	4.1 Noise Monitoring Results	7
5	ACOUSTIC CRITERIA FOR THE PROPOSED BUILDING	8
	5.1 Indoor Noise Criteria impacting on the Indoor Occupants.	8
	5.2 Environmental Noise Criteria	8
	5.3 Intrusiveness Criteria	9
	5.4 Amenity Criteria	9
6	NOISE MITIGATION OPTIONS	11
7	CONCLUSION	12

### List of Tables

Table 4.1 – Measured Existing Background ( $L_{90}$ ) & Ambient ( $L_{eq}$ ) Noise Levels, dB(A)	7
Table 5.1 – AS2107:2000 Recommended Internal Design Sound Levels	8
Table 5.2 – Applicable Amenity Noise Criteria, dB(A)	10

# 1 INTRODUCTION

---

Renzo Tonin & Associates were engaged to prepare a noise impact assessment to detail excessive noise that could be generated by the proposed development at the University of Technology, Sydney (UTS) Thomas Street Building development on the corner of Jones Street and Thomas Street, Ultimo. This noise impact assessment provides guidelines and general recommendations for the control of noise within the building and noise mitigation measures to the neighbouring properties to meet the Director-General's Requirements (DGR) Noise Key Assessment Requirements.

In accordance with relevant guidelines, this document:

- Identifies the potential sources of noise following occupancy of the proposed development;
- Specifies the noise criteria for the proposed development;
- Describes which actions and measures will need to be implemented to enable the noise criteria for the development and neighbouring properties be met.

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

## **2 EXECUTIVE SUMMARY**

---

This noise impact assessment provides guidelines and general recommendations for the control of noise generated by the proposed UTS Thomas Street building development and noise mitigation measures to the neighbouring properties to meet the Director-General's Requirements (DGR) Noise Key Assessment Requirements.

This assessment identifies the potential sources of noise following occupancy of the proposed development and specifies the noise criteria for the proposed development. Actions and measures will need to be implemented to enable the noise criteria for the development and neighbouring properties are met. The noise mitigation options for the proposed building are outlined in this noise impact assessment.

## **3 PROJECT DESCRIPTION**

---

### **3.1 Location**

The proposed development is located on the corners of Jones Street, and Thomas Street, Ultimo and is bound by Jones Street to the west, Thomas Street to the north and other UTS properties to the east and south. Other UTS and Sydney Institute of Technology are located across Jones and Thomas Streets from the proposed development.

The nearest residential building (apartment block) is located on Wattle Street facing the end of Thomas Street, 120 metres from the boundary of the proposed building.

### **3.2 Noise Sources from the Proposed Development following Occupancy**

#### **3.2.1 Summary of Noise Sources that will have impact inside the proposed Building**

1. Air Conditioning and Ventilation plant, air handling units and fans.
2. Other noisy equipments that are required for the occupancy and function of the building (to be advised by UTS at design development stage).

#### **3.2.2 Summary of Noise Sources that will have impact on neighbouring buildings and properties**

1. Condensing Units, Exhaust and Intake Fans and Plant Room Noise.
2. Other noisy equipments that are required for the occupancy and function of the building (to be advised by UTS at design development stage).

#### **3.2.3 Noise Sources that will have impact onto the proposed development**

Noise sources such as traffic noise from nearby Thomas Street and Jones Street were identified as potentially impacting onto the building envelope. On the basis of the external noise impacting upon the building fabric of the education facility, appropriate design of the building envelope will be detailed to achieve a suitable indoor amenity for occupants and achieving the limits stipulated in Australian Standard AS2107:2000 "Recommended Design Sound Levels and Reverberation Times for Building Interiors".

## 4 EXISTING ACOUSTIC ENVIRONMENT

---

In order to establish an understanding of the existing noise level on the site, noise level measurements were conducted in November 2011. Appropriately secure locations were unable to be found for long term, unattended noise monitoring. Instead, several short term attended background noise measurements were conducted during different periods of the day, corresponding to the construction hours, on Wednesday 30<sup>th</sup> November 2011. Measurements were conducted in the 'free field', away from any reflective surfaces.

The following noise monitoring locations were selected for the purpose of this assessment.

- **Location S1 – Thomas Street, Ultimo**

Northern side of proposed building on the Thomas Street footpath. The noise environment at this location was dominated by traffic noise from Thomas Street. The background noise levels at this location are considered to be representative of the nearest building (Sydney Institute Ultimo College Bldg) and the proposed building northern facade.

- **Location S2 – Jones Street, Ultimo**

Western side of proposed building on the Jones Street footpath. The noise environment at this location was dominated by traffic noise from Jones Street and Broadway. The background noise levels at this location are considered to be representative of the nearest building (UTS Bldg 10) and the proposed building western facade.

### 4.1 Noise Monitoring Results

The results of the short term measurements are shown below.

**Table 4.1 – Measured Existing Background ( $L_{90}$ ) & Ambient ( $L_{eq}$ ) Noise Levels, dB(A)**

Location	$L_{90}$ Background Noise Level	$L_{eq}$ Ambient Noise Level
Location S1 – Thomas Street, Ultimo	59	64
Location S2 – Jones Street, Ultimo	60	65

The acoustic treatment of the control of noise impact on the neighbouring buildings and noise intrusion into the proposed building will be based on the noise measurements in the above table.

## 5 ACOUSTIC CRITERIA FOR THE PROPOSED BUILDING

### 5.1 Indoor Noise Criteria impacting on the Indoor Occupants.

The indoor noise criteria for the proposed building will be in accordance with the recommendations set out in the Australian Standard 2107:2000 'Acoustics – Recommended design sound levels and reverberation times for building interiors'. Table 1 of the standard provides recommended design sound levels within internal areas.

**Table 5.1 – AS2107:2000 Recommended Internal Design Sound Levels**

Type of Occupancy	Recommended Design Sound Level, $L_{Aeq}$ , dB(A)	
	Satisfactory	Maximum
Office areas	40	45
Conference Rooms	35	40
Corridors and lobbies	45	50
Lecture Rooms up to 50 seats	30	35
Lecture Theatres (with speech reinforcement)	35	45
Lecture Theatres (without speech reinforcement)	30	35
Laboratories - Teaching	35	45
Laboratories - Working	40	50
Engineering Workshops	50	60
Libraries (General Areas)	40	50
Libraries (Reading Areas)	40	45
Libraries (Stack Areas)	45	50
Audio Visual Areas	35	45

In addition to above, noise and vibration requirements set out by the NSW Department of Environment, Climate Change and Water will also be assessed against for noise and vibration impacts affecting external neighbours as a result of the operation of the UTS Thomas Street Building.

### 5.2 Environmental Noise Criteria

All external noise emissions impacting nearby sensitive receivers as a result of the operation of the UTS Thomas Street Building are assessed in accordance with the DECCW's 'Industrial Noise Policy' (INP). The assessment procedure in terms of the INP has two components:

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

### 5.3 Intrusiveness Criteria

According to the INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the  $L_{Aeq}$  descriptor), measured over a 15-minute period, does not exceed the background noise level measured in the absence of the source by more than 5dB(A). It is noted that this is applicable to residential properties only.

Therefore, the intrusiveness criterion for residential noise receptors as summarised in the INP is as follows:

$$L_{Aeq, 15 \text{ minute}} \leq \text{Rating Background Level (L}_{A90}) + 5 \text{ dB(A)}$$

The nearest residential building (apartment block) is located on 511 Wattle Street facing the end of Thomas Street, 120 metres from the nearest boundary of the proposed building. Due to the existing high level of traffic noise on Wattle Street (66dBA<sub>(L90)</sub> and 72dBA<sub>(Leq)</sub> based on our measurements at 513-519 Wattle Street in June 2010) and the distance of the residence from the proposed development (120 metres), the noise generated from the proposed building would not have any impact at the nearest residential building and therefore will not be assessed for in this report from herein.

### 5.4 Amenity Criteria

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the NSW INP, the applicable parts of which are reproduced below.

Nearby critical receivers consist of the following:

- **UTS Building CB02** – located directly to the south of the proposed UTS Thomas Street Building site and consisting of indoor teaching spaces.
- **UTS Building CB04** – located directly to the east of the proposed UTS Thomas Street Building site and consisting of indoor teaching spaces.
- **UTS Building CB10** – located to the west of the proposed Thomas Street Building, across Jones Street and consisting of retail areas, office spaces and indoor teaching spaces.
- **Ultimo TAFE College** – located to the north of the proposed Thomas Street Building, across Thomas Street and consisting of indoor teaching spaces.

Based on the type of receivers nominated above, the following amenity criteria ( $L_{Aeq}$ ) will be applied.

**Table 5.2 – Applicable Amenity Noise Criteria, dB(A)**

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L <sub>Aeq</sub> Noise Level	
			Acceptable	Maximum
School classroom - internal	All	Noisiest 1-hour period when in use	35	40
Commercial Premises	All	When in use	65	70

As a general rule, masonry / brick type building structures would typically provide a 15dB(A) reduction from external noise levels to internal noise levels. Therefore, the equivalent external amenity noise criterion for the teaching areas of the nominated receiver locations would be **60dB(A)**.

## 6 NOISE MITIGATION OPTIONS

---

As the type of mechanical plant items are not yet finalised at this early stage of the design process, all mechanical plant, once selected, will have their noise specifications and their proposed locations checked prior to their installation on site, to ensure that they will not either singularly or in total emit noise levels which exceed the noise limits specified in Section 4 above.

If noise emissions from these plant items are calculated to be in excess of the set criteria at the affected receivers during the detailed design stage, then further appropriate acoustic treatment will be implemented to ensure compliance with the relevant noise criteria. In general, noise controls for mechanical plant are standard and commercially available, and can be readily added to silence any potentially noisy plant. Such noise control treatment may include any of the following:

- procurement of 'quiet' plant;
- installation of commercially available silencers over noisy fans;
- installation of acoustic louvres in lieu of architectural louvres or grills;
- incorporation of suitable building façade and glazing to control noise intrusion into the building,
- installation of specific acoustic treatment for the building air conditioning, ventilation and hydraulic services.

## **7 CONCLUSION**

---

The guidelines and criteria to address the noise impact assessment to detail excessive noise that could be generated by the proposed Thomas Street building development at the University of Technology, Sydney (UTS) on the corner of Jones Street and Thomas Street, Ultimo has been outlined.

Detail design of the proposed building envelope and associated services will be undertaken at the design development and contract documentation stage to achieve the criteria outlined above. It can be predicted that the proposed development is capable of complying with the applicable noise criteria outlined in this report by incorporating the appropriate noise control measures.

The study of external noise intrusion into the subject development has found that appropriate controls can be incorporated into the building design to achieve a satisfactory accommodation environment consistent with the intended quality of the building and relevant standards.