

# ACOUSTIC LOGIC CONSULTANCY

noise and vibration consultants

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5 August 2010

Report: REP-MH-AC-00003-T04

Prepared for: Theiss

## ROYAL NORTH SHORE HOSPITAL – ACUTE BUILDING

### ACOUSTIC ASSESSMENT OF PROPOSED HELIPAD

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### **Appendix – Proposed Flight Paths**

## **1. INTRODUCTION**

We have been asked to review potential acoustic impacts associated with the operation of a helicopter pad proposed to be constructed on the roof of the Royal North Shore Hospital, Acute Building as part of a proposed section 75W application.

In this report we will:

- Review the proposed location and expected level of usage of the proposed helipad.
- Identify potentially affected noise receivers.
- Identify appropriate acoustic guidelines.
- Compare existing noise impact on nearby development to relevant standards, and compare any expected increase in noise level to noise levels generated by the existing helipad at the Royal North Shore Precinct.

## **2. SITE DESCRIPTION**

The helipad is to be constructed on the roof of the proposed Acute Building, which is located within the Royal North Shore Hospital site, St Leonards.

The helipad is proposed to be constructed on the level 9 roof of the Acute Building, in the south-eastern corner of the building.

The Acute Building is surrounded by other buildings in the Royal North Shore Hospital Precinct. The nearest residential developments to the site are the residential towers to the east of the site, on Herbert Street, approximately 150m from the proposed helipad.

This helipad is proposed to be used in conjunction with the existing helipad on top of the Douglas Building, to the west of the Acute Building.

An AW139 helicopter is the design helicopter for the proposed new helipad.

As with the existing helipad, the proposed new helicopter pad is to be used only for emergencies. At present, the existing helipad is used (on average) 15-20 times per month (approximately once every two days). The number of flight movements is projected to increase by 4% per year.

There is expected to be no net increase in total number of helicopter movements as a result of the construction of the new helipad. Rather, the existing number of flight movements will be distributed between the two pads, depending on which building in the hospital the patient is being delivered to/picked up.

Proposed flight paths are shown in the attached plan, appendix 1.

### 3. ACOUSTIC CRITERIA / CONTROLS

#### 3.1 NOISE IMPACTS ON NEARBY DEVELOPMENT

The proposed helipad is to be used for emergency flights only.

Typically applied noise emission guidelines such as the DECC *Industrial Noise Policy* are not applicable for the assessment of emergency vehicle noise.

Further, even guidelines such as the DECC *Managing Vehicle Noise* are not applied, as noise associated with the use of emergency vehicles is expressly excluded from compliance with acoustic controls.

We note that in its *Acoustic Statement of Commitments* prepared by ArupAcoustics on behalf of Thiess that helicopter noise from the site would be assessed with reference to the Air Services Australia document *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise*. Relevant principles are as follows:

*Principle 7 – There should be a current agreed aircraft noise exposure level above which no person should be exposed, and agreement that this level should be progressively reduced. The goal should be 95dB(A).*

Where practicable, compliance with this principle will be achieved.

#### 3.2 NOISE IMPACTS WITHIN THE ROYAL NORTH SHORE PRECINCT

Design of the building shell of the Acute building will be undertaken with a view to achieving the internal noise levels set out in the table below:

**Table 1 – Recommended Internal Noise Level – Helicopter Noise**

SPACE TYPE	NOISE LEVEL OBJECTIVE dB(A) <sub>L<sub>max</sub></sub>
Operating Theatres	65
Wards, Treatment Rooms, Consulting Rooms. Private Offices, Conference Rooms.	70
Offices – general, Laboratories	75
Service Areas	85

In our experience this is an acceptable noise level for noise generated as a result of emergency vehicles, bearing in mind the infrequency of these events.

## 4. ANALYSIS AND COMMENTS

### 4.1 IMPACT ON NEARBY DEVELOPMENT

Although noise from emergency vehicles is exempted from acoustic controls, a review of potential noise impacts will be conducted to compare projected noise levels with:

- Noise levels likely to be generated by the existing helipad (on the Douglas Building) and
- With the 95dB(A) $L_{max}$  objective in the Air Services Australia guidelines.

Assumptions adopted in this analysis are as follows:

- Sound level generated by the design helicopter (AW139) is 103dB(A) at 15m.
- Approach gradient of AW139 helicopter is as per drawing DWG-CW-AR-1401 dated 22 April 2010 by Cox Richardson.

Maximum predicted noise level at nearby residential properties will occur in the event that a helicopter landing movement flies directly over one of the residential towers on Herbert Street. Based on the assumed approach gradient, the likely distance between the helicopter and the top floor apartments can be determined, and a resultant noise level determined. Predicted noise levels are presented below:

**Table 2 – Helicopter Noise – Worst Affected Residences  
(Top Floor, Herbert Street Residences)**

Receiver Location	Air Services Australia Guideline	Predicted Noise Level	
		Typical Approach Movement	Worst Case Approach Movement*
Herbert Street (approx level 11)	95dB(A) $L_{max}$	88dB(A) $L_{max}$	98dB(A) $L_{max}$

\*Assuming approach movement directly over residential properties.

**Table 3 – Helicopter Noise – Residences Below Preferred Flight Path  
(Residences South of Pacific Highway)**

Receiver Location	Air Services Australia Guideline	Predicted Noise Level - Based on AW139 Helicopter at Acute Building
South of Pacific Highway (under preferred approach path)	95dB(A) $L_{max}$	77dB(A) $L_{max}$

\*Assuming approach movement directly over residential properties.

Comments:

- Noise levels from all typical helicopter movements comply with acoustic criteria at nearby residential developments.

- Noise level at the top floor residences on Herbert Street is predicted to marginally exceed Air Services Australia guidelines in the event of a helicopter movement directly over the apartment building. In this event, a 3dB(A) exceedance of the acoustic guidelines is anticipated. However, in our opinion, the noise impact on these apartments will still be acceptable keeping in mind:
  - The helicopter movement which will generate the exceedance is not the preferred flight path, and would only occur during unfavourable weather conditions.
  - We are advised that approximately 5% of flights are expected to take off directly over the Herbert Street apartment building. Assuming a total of 15-20 flights per month, this would equate to approximately only one flight per month travelling directly over the Herbert Street buildings.
  - The predicted exceedance of guidelines is relatively minor (3dB(A)), a difference which is just perceptible to the human ear.
  - The predicted worst case scenario noise level of approximately 98dB(A) is similar to what may be expected in the event of a police car/fire truck with siren (or other emergency vehicle) passing by a residential properties at ground level.
- Assuming that the “Fly Neighbourly” principles set out in the Air Services Australia *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise* guidelines are adopted (minimising flying directly over residential areas, flying predominantly areas with high ambient levels such as highways, minimising ground idle time), noise impacts will be minimised as much as practicable.

## 4.2 IMPACTS WITHIN THE DEVELOPMENT

Acoustic design of the building shell is to be undertaken so as to ensure noise levels compliant with table 1 are achieved. This will require, in principle:

- Construction of a concrete slab roof on level 9 for the wing of the building directly below the helipad.
- In the event that other wings of the building are constructed using a light weight roof structure (sheet metal), use of an upgraded ceiling system will be adopted (double sheet plasterboard ceiling or system of equivalent acoustic performance).
- High acoustic performance glazing for windows to noise sensitive rooms (wards, offices, meeting rooms) on upper levels of the building (including any future construction of additional floors on the northern side of the hospital) will be adopted.
- Based on measurements of helicopter landing movements at similar helipads, no vibration attenuation treatments are necessary to prevent excessive vibration transmission from the helipad in to the hospital building.

We recommend that the building shell of any future buildings in the Royal North Shore Precinct be reviewed to ensure that noise impacts will not be excessive.

## 5. CONCLUSION

We have reviewed acoustic impacts associated with a helipad proposed to be constructed on the roof of the Acute Building at the Royal North Shore Hospital.

Although there are no mandatory acoustic guidelines regarding noise from the operation of emergency vehicles, noise impacts on nearby developments will generally comply with maximum allowable noise levels pursuant to Air Services Australia *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise* guidelines. In addition, provided that, where practicable, the Fly Neighbourly principles in that guideline are adopted, noise impacts on nearby residential developments will be limited to levels quieter than the maximum allowable level in those guidelines.

We further confirm that acoustic design of the building shell of the Acute building will be undertaken to ensure noise impacts within the building will not be excessive. Similarly, we recommend that any future development also be acoustically reviewed.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'T. Taylor', is positioned above the printed name.

ACOUSTIC LOGIC CONSULTANCY PTY LTD  
Thomas Taylor

**APPENDIX 1**

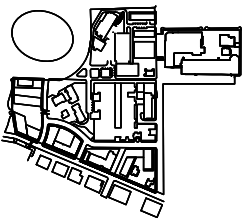
**PROPOSED FLIGHT PATHS**



2. COMPARE THE COX GROUP PTV LTD 2008

Rev	Question	By	Date
T01	ISSUED FOR INFORMATION	HK	04/05/10

## KEY PLAN



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Tel: 612 9267 8698 Fax: 612 9264 0644  
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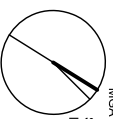


**Project**  
**ROYAL NORTH SHORE HOSPITAL**  
**AND COMMUNITY HEALTH SERVICES**  
**PPP PROJECT**

ACUTE HOSPITAL HELIPAD  
APPROACH PLAN -  
ELITE RE CONTEXT

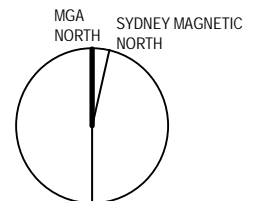
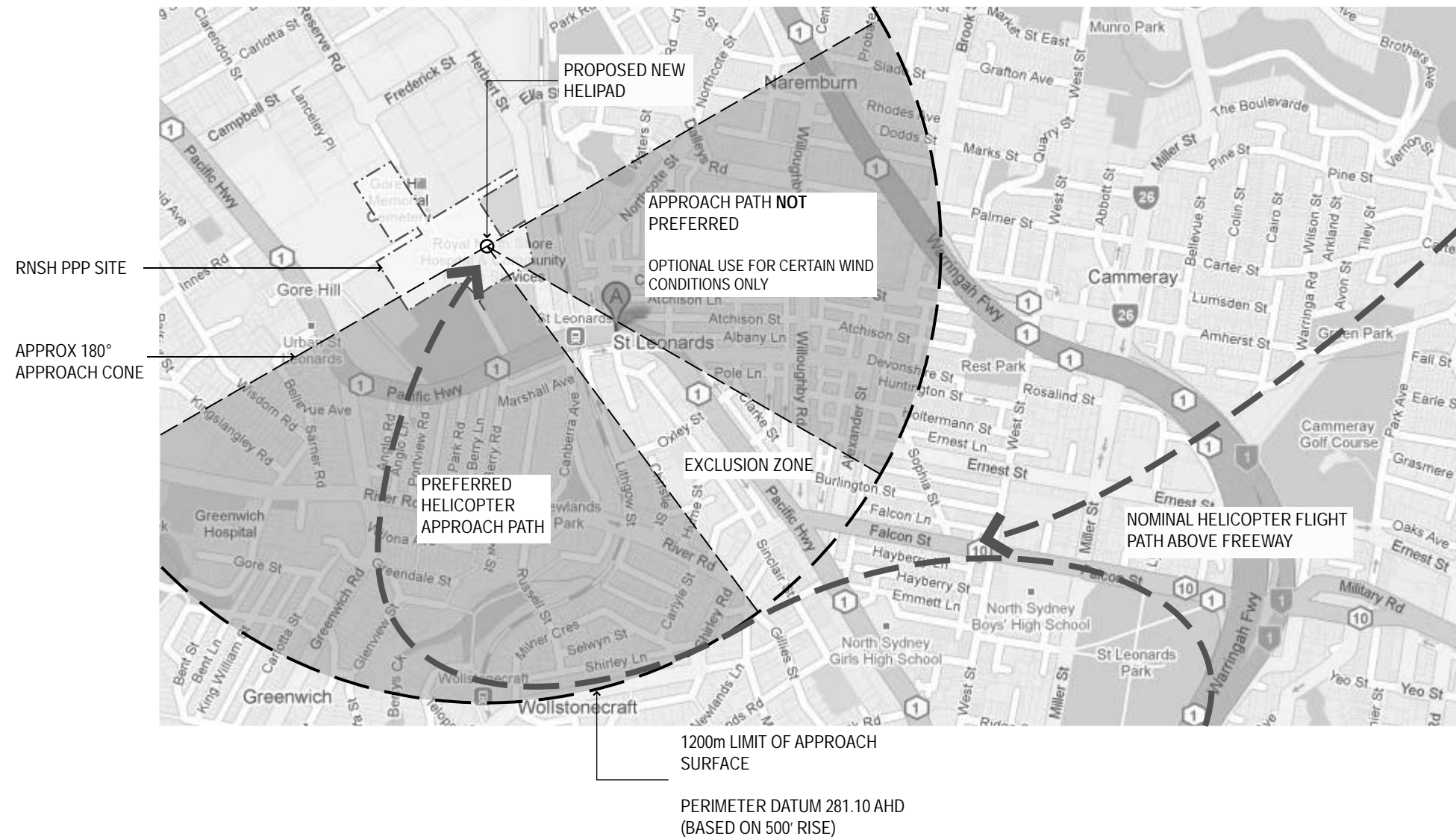
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Coordinate	Date 04/05/10
Project Archtect	Rev T01
Project Director	
Drawing Number	
DWG-CW-AR-01104	

**GEOGRAPHIC SCALE**



**MGA NORTH**  
**SYDNEY MAGNETIC**  
**NORTH**

**NOTE:**  
HLS SURFACE EXTENDS  
TO A RADIUS OF 1200m  
FROM HELIPAD



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Architecture Planning Urban design Interior design Health facility design



**NSW HEALTH**  
Working as a Team

Project  
ROYAL NORTH SHORE HOSPITAL AND  
COMMUNITY HEALTH SERVICES PPP PROJECT

Drawing Title  
ACUTE HOSPITAL HELIPAD APPROACH PLAN -  
LOCAL CONTEXT

Date  
04/05/10

Drawn  
HK

Project Architect  
MG

Scale  
NTS

CAD File Location

Drawing Number  
DWG-CW-AR-01102-T01

GRAPHIC SCALE

