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Graythwaite Rehab Centre Ryde Hosp - Emergency Generator Assessment

1 INTRODUCTION

This report provides our acoustic assessment of noise emissions from the operation of an emergency generator proposed to be installed on the ground floor of the Graythwaite Rehabilitation Centre at Ryde Hospital

Assessment of noise emissions to nearby properties will be conducted with reference to acoustic criteria typically adopted by the Office of Environment and Heritage (OEH) for emergency generators.

2 ACOUSTIC CRITERIA

2.1 EXTERNAL NOISE EMISSIONS

The nearest noise sensitive developments are the residential properties to the north of the site, on the opposite side of Fourth Avenue.

We note that emergency equipment is typically excluded from assessment against acoustic guidelines such as the Industrial Noise Policy.

However, for emergency generators which will potentially operate at night time, the OEH (in its Noise Control Manual) recommend that noise levels not exceed background noise levels by more than 5dB(A). This will be the criterion adopted for this assessment.

Background noise levels were determined by long term noise logging on site at DA stage. Measured background noise level and corresponding noise emission goal are as follows:

Table 1 - External Noise Emission Criteria

Location	Time of Day	Background Noise Level – dB(A)L_{90}	Noise Emission Goal dB(A)L_{eq}
All Potential Affected Neighbouring Boundaries	Night (10pm-7am)	35	40

2.2 INTERNAL NOISE LEVELS

Australian Standard 2107:2000 "*Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors"* has been implemented to set criteria for noise levels from the operation of the emergency generator within the development. These criteria are presented below.

Table 2 -Noise Criteria for Mechanical Services in Health Buildings AS2107

SPACE/ACTIVITY TYPE	NOISE LEVEL L_{eq} dB(A)	
	Satisfactory Level	Maximum Level
Corridor and lobby spaces	40	50
Consulting rooms	40	45
Treatment Rooms	40	45
Offices	40	45
Office Areas	40	45
Staff Stations	40	45
Ward Spaces	30	35
Store Rooms	45	50
Waiting Rooms Reception	40	45
Toilets and Change Rooms	45	50

3 RECOMMENED TREATMENTS

3.1 RECOMMENDATIONS

We note that final generator selection has not been completed. Indicative selection consists of Cummins Enclosed Genset 350 D5 (with acoustic canopy) with a sound power level of approximately 99dB(A). Contractor should receive acoustic advice to confirm that the proposed treatments remain applicable after final selection of plant.

Recommended indicative acoustic treatments are as follows:

- Generator to be used only in emergency. Testing of the generator should be done outside of office hours, or with consent of users of the office space below the plant room.

- Generator to be installed on a concrete plinth. Plinth is to be isolated from the structural slab by two layers of 10mm thick Vibramat (from Acoustic Supplies) or equal. There should be not rigid connection between plinth and structural slab.

- Generator should be isolated from the plinth using 40mm static deflection spring vibration isolators.

- Plant room construction:

    - Generator room walls to consist 190mm hollowcore blockwork.

    - Generator room doors to be 45mm solid core doors with full perimeter acoustic seals. Raven RP24 seels should be applied to the head and jamb, Raven RP16si should be installed at the meeting stile of double doors and RP32si seals should be installed at the door base.

    - Fuel lines within 20m of the generator are to have 25mm static deflection spring isolators.

    - Any pipe penetration to slab or plant room walls as per Appendix 1.

- Air intake:

    - Intake louvre is located on the southern façade of the plant room to the car park.

    - Intake air opening to be maximum 2000mm by 2000mm. Any unused section of external louvre to be blanked off using the same construction as for the external walls.

    - Install an 1800mm long 50% open area attenuator (200mm wide splitters) behind the air intake opening. Minimum insertion loss as follows.

Freq (Hz)	63	125	250	500	1000	2000	4000	8000
Insertion Loss -dB	8	16	22	30	33	23	16	14

- Air discharge:

    - Air discharge is located on the northern side of the generator room.

    - Discharge ducting cross sectional area is assumed to be approximately 1000mm by 1400mm.

    - Install a 1200mm long 50% open area attenuator (200mm wide splitters) in the vertical of the discharge ducting. Minimum insertion loss as follows.

Freq (Hz)	63	125	250	500	1000	2000	4000	8000
Insertion Loss -dB	6	12	16	22	24	17	13	11

- Gas discharge:
  - We assume generator manufacturer will produce a proprietary gas discharge muffler.
  - Muffler should achieve a noise level of no more than 70dB(A) at one meter from the discharge point and there should be no line of sight between the discharge point and any residential property.
  - Gas discharge to be vibration isolated using 25mm static deflection spring isolators.
  - Gas discharge muffler is to be installed within the generator room (i.e. not at roof level).

3.2 DISCUSSION

Limitations of this advice:

- This advice has been based on an indicative generator selection and contractor's final selection should be acoustically reviewed.
- Although vibration isolation treatments have been recommended, ALC have not been advised of any equipment on level 1 or 2 which are exceptionally vibration sensitive.

4 CLOSURE

Noise emissions from the a proposed emergency generator located on the ground floor of the Graythwaite Rehabilitation Centre have been assessed with reference to typically adopted OEH guidelines.

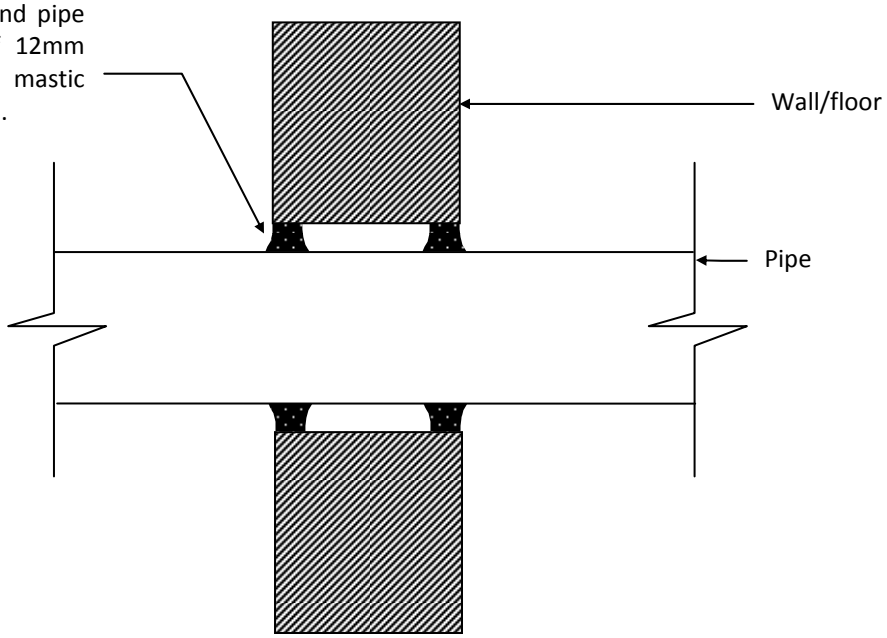
Provided the acoustic treatments set out in section 3 of this report are adopted, noise acoustic impacts on nearby development will be satisfactory.

Yours faithfully,

ACOUSTIC LOGIC CONSULTANCY PTY LTD
Tom Aubusson

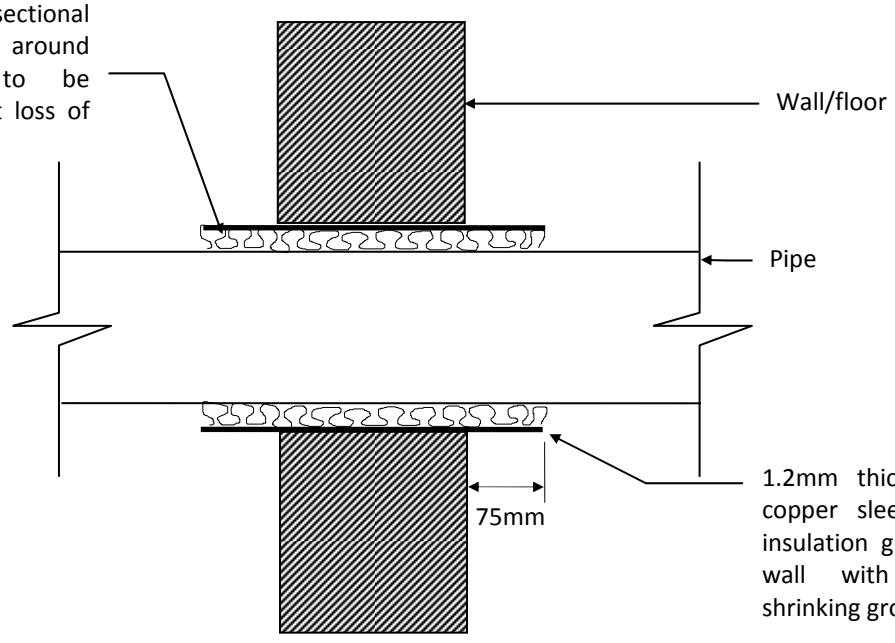
Appendix 1
Pipe Penetration Detail

10-15mm clear gap around pipe filled for min. depth of 12mm with non-setting flexible mastic similar to Bostik Fireban 1.



TYPE PA PIPE SEAL

25mm thick rockwool sectional pipe sleeve insulation around pipe Rockwool is to be encapsulated to prevent loss of fibres.



1.2mm thick steel or copper sleeve around insulation grouted into wall with a non-shrinking grout.

TYPE PB PIPE SEAL