

134-136 Goodwood Road

Noise Assessment

September 2018

S5702C4

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INTRODUCTION

An acoustic assessment has been made of the proposed residential apartments located at 134-136 Goodwood Road, Goodwood.

The proposed development comprises two levels of residential apartments which front Goodwood Road. The site is located 100 meters south of the tram line amongst existing commercial land uses. The site locality is shown in Appendix A.

The assessment has considered the ingress of tram and traffic noise into the apartments against the Development Plan requirements for appropriate residential amenity.

This assessment has also considered the environmental noise from the proposed development at nearby sensitive land uses. Specifically, the following noise sources have been considered:

- On-site vehicle movements;
- General car park activity;
- Rubbish collection; and,
- Mechanical plant servicing the facility.

The assessment has been based on:

- *DKO Architecture's* Feasibility Study titled "Goodwood Road, Goodwood", pages 1-17, dated 20 June 2018; and,
- Noise measurements of the existing acoustic environment on Goodwood Road conducted on 10-13 July 2018.

CRITERIA

Development Plan

The proposed development site and residences to the south which front Goodwood Road are located within the *Neighbourhood Centre Zone* of the Unley (City) Council Development Plan. Residences north of the site which front Goodwood Road are located within the *Historic Conservation – Centres Zone* of the Development Plan. Sensitive land uses to the west of the site are within *Policy Area 11 – Landscape Precinct 11.1* within the *Residential Streetscape (Landscape) Zone*. Residences to the east of the site are within *Policy Area 1 – Compact Historic Goodwood Estate* within the *Residential Historic Conservation Zone*. The Development Plan has been reviewed and the following provisions are considered relevant to the noise assessment.

Council Wide – Interface Between Land Uses

OBJECTIVES

- 1 *Development located and designed to minimise adverse impact and conflict between land uses.*
- 2 *Protect community health and amenity from adverse impacts of development.*
- 3 *Protect desired land uses from the encroachment of incompatible development.*

PRINCIPLES OF DEVELOPMENT CONTROL

1. *Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:*
 - (b) noise
2. *Development should be sited and designed to minimise negative impacts on existing and potential future land uses desired in the locality.*
4. *Residential development adjacent to non-residential zones and land uses should be located, designed and/or sited to protect residents from potential adverse impacts from non-residential activities.*

Noise Generating Activities

7. *Development that emits noise (other than music noise) should include noise attenuation measures that achieve the relevant Environment Protection (Noise) Policy criteria when assessed at the nearest existing noise sensitive premises.*
8. *Development with the potential to emit significant noise (e.g. industry) should incorporate noise attenuation measures that prevent noise from causing unreasonable interference with the amenity of noise sensitive premises.*

Council Wide – Centres and Shops

PRINCIPLES OF DEVELOPMENT CONTROL

Location and Design

12. *The location and design of centres and shopping development should ensure that all sources of noise, including refrigeration and air conditioning equipment, garbage collection and car parking, do not cause excessive or disturbing noise at neighbouring properties.*

Council Wide – Medium and High Rise Development (3 or More Storeys)

OBJECTIVES

- 2 *Residential development that provides a high standard of amenity and adaptability for a variety of accommodation and living needs.*
- 4 *Development that integrates built form within high quality landscapes to optimize amenity, security and personal safety for occupants and visitors.*

PRINCIPLES OF DEVELOPMENT CONTROL

Design and Appearance

7. *Balconies should be integrated into the overall architectural form and detail of the development and should:
(b) be designed and positioned to respond to (...) acoustic conditions to maximise comfort and provide visual privacy;*

The noise sources which have been assessed in the vicinity of the site are traffic on Goodwood Road and tram movements on the nearby rail corridor. The appropriate criteria for noise intrusion into an apartment from road and rail corridors can be derived from the relevant provisions of the Development Plan and the contemporary State Government approach provided by the Minister's Specification SA 78B. The western portion of the development interfaces with a school. The noise from children playing is rarely of concern particularly where the school is an existing known activity in the environment and to future purchasers. No further assessment of the school has been made.

Minister's Specification SA 78B

The intent of *Minister's Specification SA 78B* (SA78B) is to protect the occupants of residential buildings from the sound intrusion of road and rail corridors and from mixed use activity. To this end, SA78B establishes "performance requirements" to be met by a development.

SA78B introduces mandatory requirements under the Building Code of Australia (BCA) depending primarily on "designation" in the Development Plan. The development site is not designated; nonetheless SA78B provides the most contemporary objective noise criteria, which satisfy the general intent of the Development Plan provisions. Therefore it is proposed that the criteria of SA78B be adopted for this project. The design basis of SA78B is to provide a facade which achieves the internal sound criteria shown in Table 1.

Table 1: SA 78B internal sound criteria for road and rail sound intrusion.

Type of room	Internal sound criteria		Applicable time period
	Building design target averaged over the total number of such rooms in the building	Maximum allowable for individual rooms in the building	
Bedroom	30 dB(A) $L_{eq, 9hr}$	35 dB(A) $L_{eq, 9hr}$	Night (10pm to 7am)
Habitable room, other than a bedroom	35 dB(A) $L_{eq, 15hr}$	40 dB(A) $L_{eq, 15hr}$	Day (7am to 10pm)

Environment Protection (Noise) Policy 2007

Principle of Development Control 7 from the Development Plan references the *Environment Protection (Noise) Policy 2007*, which provides goal noise levels to be achieved at residences from general activity at a site and specific provisions for other activity such as rubbish collection.

The Policy is based on the World Health Organisation Guidelines to prevent annoyance, sleep disturbance and unreasonable interference on the amenity of an area. Therefore, compliance with the Policy is considered to be sufficient to satisfy all provisions of the Development Plan relating to environmental noise.

General Activity

The Policy provides goal noise levels to be achieved at residences based on the principally promoted land use of the Development Plan Zones in which the noise source (the development) and the noise receivers (the residences) are located. Based on the land uses and the “development” nature of the project, the following goal noise levels are provided by the Policy to be achieved at residences:

- Residences within the *Neighbourhood Centre Zone* or *Historic Conservation – Centres Zone*:
 - An average (L_{eq}) noise level of 57 dB(A) during the daytime (7am to 10pm); and,
 - An average (L_{eq}) noise level of 50 dB(A) at night (10pm to 7am).
- Residences within *Policy Area 11 – Landscape Precinct 11.1* or *Policy Area 1 – Compact Historic Goodwood Estate*:
 - An average (L_{eq}) noise level of 52 dB(A) during the daytime (7am to 10pm);
 - An average (L_{eq}) noise level of 45 dB(A) at night (10pm to 7am); and,
 - A maximum (L_{max}) noise level of 60 dB(A) at night (10pm to 7am).

When measuring or predicting noise levels for comparison with the Policy, adjustments may be made to the average goal noise levels for each “annoying” characteristic of tone, impulse, low frequency, and modulation of the noise source. The characteristic must be dominant in the existing acoustic environment and therefore the application of a penalty varies depending on the assessment location, time of day, the noise source being assessed, and the predicted noise level. Given the existing high noise levels within the environment from traffic on Goodwood Road, a penalty is not warranted at any nearby sensitive receivers.

Noise from Rubbish Collection

The Policy deals with rubbish collection by effectively limiting the hours to the least sensitive period of the day. Division 3 of the Policy requires rubbish collection to only occur between the hours of 9am and 7pm on Sundays or public holidays, and between 7am and 7pm on any other day, except where it can be shown that the maximum (L_{max}) noise level from such activity is less than 60 dB(A) or no greater than existing noise in the environment.

ASSESSMENT

Traffic and Tram Noise

The noise impact from traffic and tram movements at the proposed site has been determined from measurements of the existing environment at the site over a 3 day period between 10 July and 13 July 2018. Measurements were taken on Goodwood Road at a position equivalent to level 1 of the proposed apartments. The logging location is shown in Appendix A.

Noise levels within all of the proposed apartments have subsequently been predicted using a noise propagation model in the SoundPlan noise modelling software, which was calibrated using the measured results for traffic and tram noise on Goodwood Road. The model takes into account the shielding and reflections from nearby structures, and the separation distance from the road and rail corridors. Based on the model, the following noise levels are predicted at the development façades:

Table 2: Highest predicted external noise levels.

Facade	Level 1		Level 2	
	Day	Night	Day	Night
East	67 dB(A)	63 dB(A)	63 dB(A)	59 dB(A)
North and South	64 dB(A)	60 dB(A)	64 dB(A)	60 dB(A)

Internal noise levels were then predicted based on the proposed site plan and facade constructions.

The following acoustic treatments are required in order to achieve the Minister's Specification design criteria throughout the development. The following recommendations are based on the openable windows or doors (including sliding doors) incorporating acoustic seals which ensure the suite is airtight when closed:

- Construct the glazed sections of the apartment façades shown in **GREEN** in Figure 2 from 10.5mm VLam Hush glass (or similar) with a minimum transmission loss as shown in Table 3;
- Construct the glazed sections of the apartment façades shown in **ORANGE** in Figure 3 from 10.38mm laminated glass (or similar) with a minimum transmission loss as shown in Table 3;
- Construct the glazed sections of the apartment façades shown in **RED** in Figure 2 and Figure 3 from 6.38mm laminated glass (or similar) with a minimum transmission loss as shown in Table 3;

Table 3: Minimum required façade transmission losses.

Façade Construction	Octave Band Centre Frequency, Hz						
	63	125	250	500	1000	2000	4000
10.5mm VLam Hush glass	21	27	31	26	40	40	47
10.38mm laminated glass	20	26	27	33	35	37	45
6.38mm laminated glass	14	20	24	31	35	33	37
100mm precast concrete	37	37	36	45	52	59	62

Figure 2: Level 1 minimum glazing requirements.

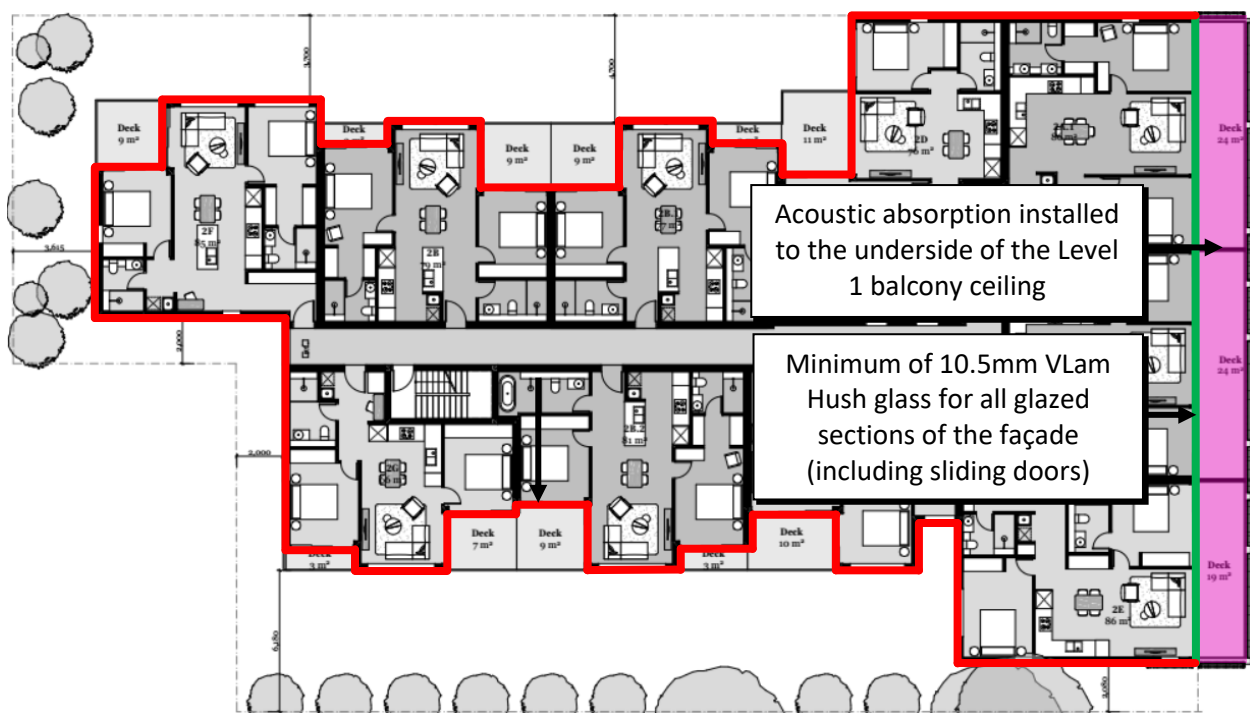
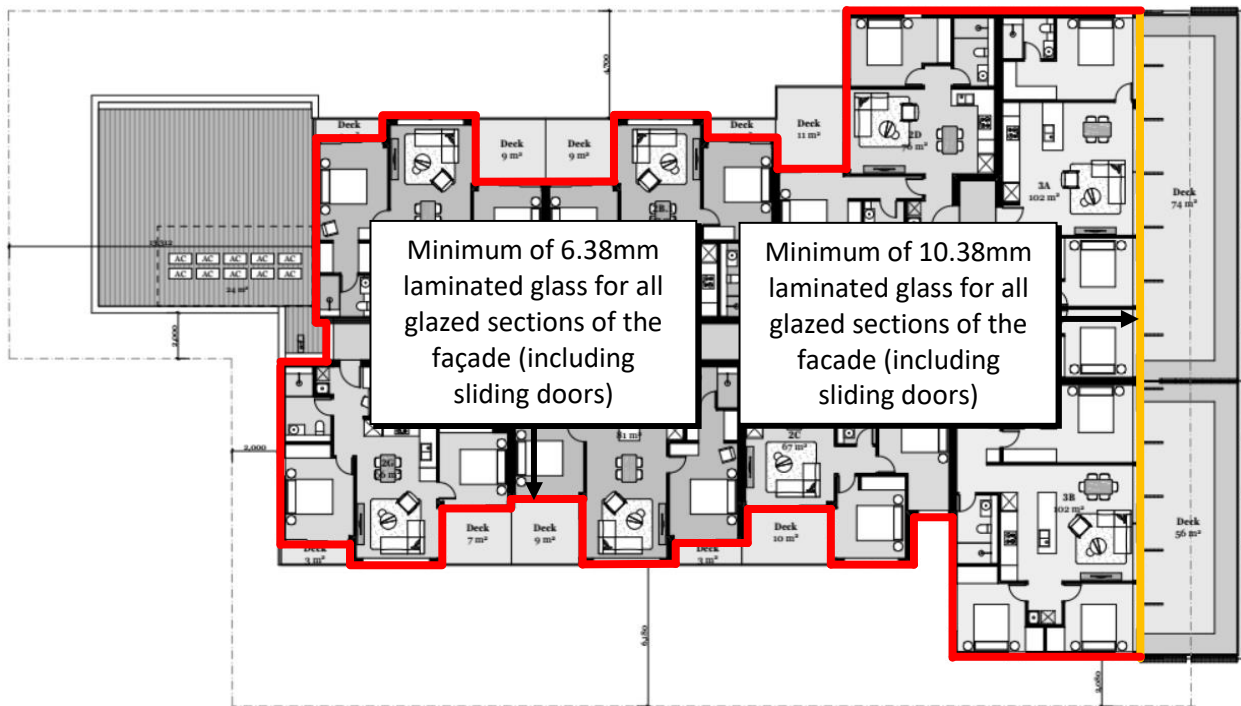
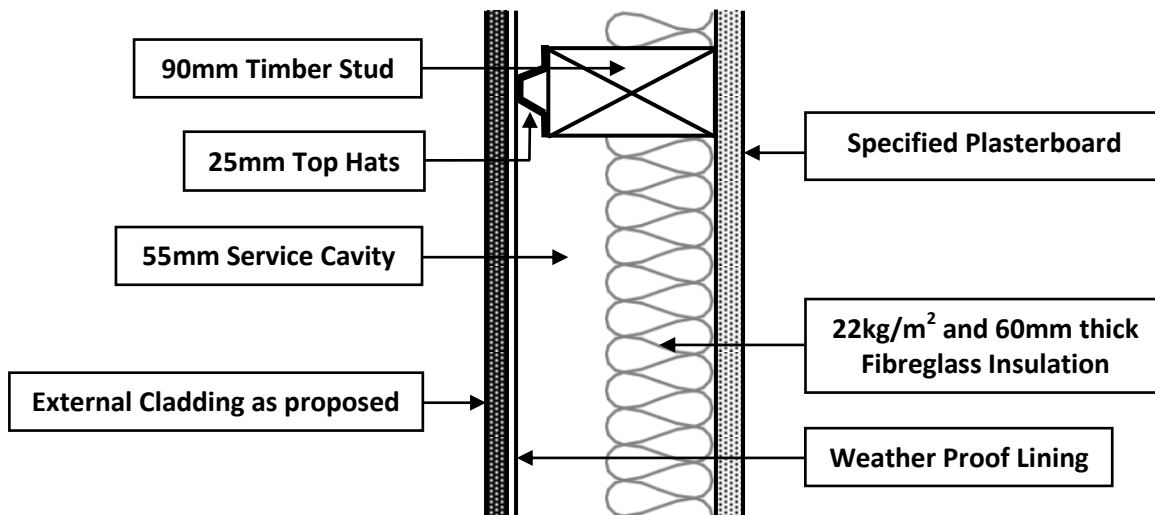


Figure 3: Level 2 minimum glazing requirements.



- Construct all non-glazed sections of the facades from the following (or equivalent):
 - External cladding as proposed with weather proof lining (sarking) behind, fixed to the studs with 25mm Top Hats;
 - 90mm wide internal studs;
 - 60mm thick insulation, with a minimum density of 22 kg/m^3 , installed in the cavity; and,
 - the following internal linings mounted to the studs, as shown in Figures 6 and 7:
 - Two layers of 16mm thick fire rated plasterboard for the extent shown in **RED**;
 - 16mm thick fire rated plasterboard for the extent shown in **ORANGE**;
 - 10mm thick plasterboard in all other areas.
- The described wall section (shown in Figure 4) is similar to the *HardieSmart™ Boundary Wall System* which could be used in lieu of the above construction if the recommended internal linings are maintained.

Figure 4: General Wall Section (not to scale).



- Install any metal cladding or render finish on top of a layer of 9mm (or greater) compressed fibre cement sheet in all locations where it is proposed to form part of an external wall to a habitable space, as shown in Figure 5.

Figure 5: Metal cladding/Render Finish Wall Section (not to scale).

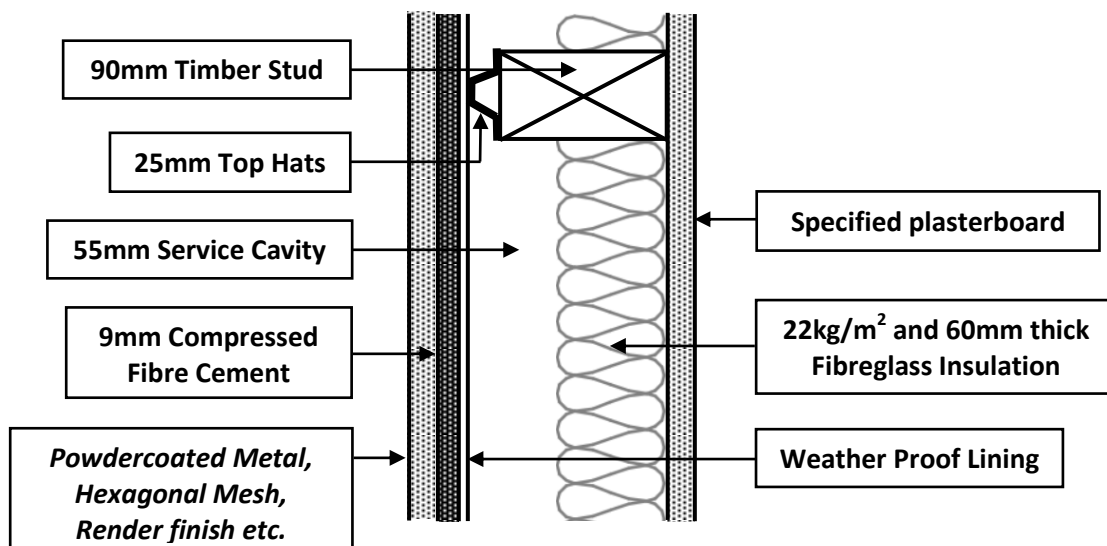


Figure 6: Level 1 internal lining requirements.

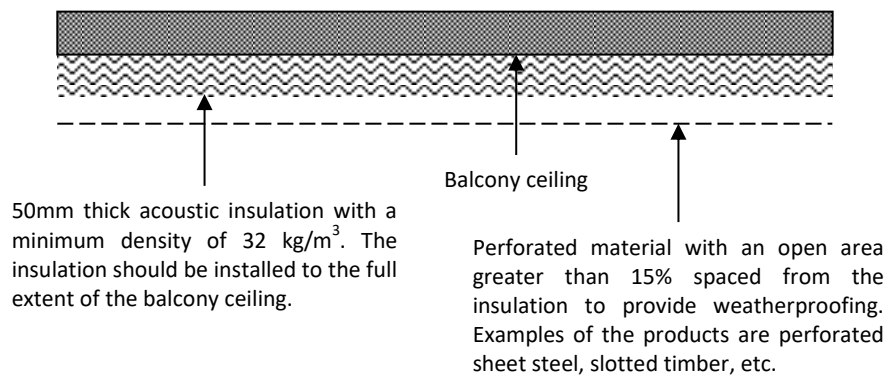


Figure 7: Level 2 internal lining requirements.



- Install acoustic absorption material, such as 50mm thick polyester insulation with a minimum density of 32kg/m^3 in accordance with Figure 8, or a proprietary weather proof product with an “NRC” rating of 0.8 or greater (“Stratocell Whisper” or similar), to the full extent of the Level 1 balcony ceiling as indicated in **PINK** in Figure 1.

Figure 8: Balcony absorption construction detail.



Environmental Noise

General Activity and Mechanical Plant

The proposed development is to be located within an existing high noise environment such that the environmental noise generated at the development site will be of no consequence to neighbouring properties, including noise sensitive residences. Noise from activity on the site is predicted to be much lower than the existing background noise levels within the environment.

Further to this, the proposed mechanical plant, comprising domestic sized air conditioning units, will be located within a designated area on Level 2 at 80m from the nearest residence. The designated area is at a setback from the roof edge such that residences will not have direct line of sight to the plant units due to shielding provided by the structure.

Additionally, vehicle activity associated with the development will occur adjacent to the Goodwood Road, or within the covered carpark which will provide significant shielding to residences. Given the small scale of activity proposed on the site, existing high noise from Goodwood Road, and significant shielding provided by buildings in the area, the goal noise levels of the Policy will be achieved without any specific acoustic treatments. Therefore, the environmental noise from the site will not adversely affect the amenity of nearby residences.

Rubbish Collection

Given the distance to residences and the existing noise from Goodwood Road, there are no specific acoustic treatments or operating restrictions required to satisfy the Policy provisions relating to rubbish collection.

CONCLUSION

An acoustic assessment has been made of the proposed residential apartments located at 134-136 Goodwood Road, Goodwood.

The assessment has considered the ingress of tram and traffic noise on the occupants of the apartments.

The predicted noise levels within the apartments will achieve the adopted criteria of *Minister's Specification SA 78B* subject to the recommended measures in this report, comprising;

- specific facade constructions; and,
- installation of acoustic absorption to the Level 1 balcony ceiling.

The environmental noise generated by the site has been considered to not have an adverse impact on the amenity of all nearby sensitive receivers. The site will achieve the goal noise levels of the Policy with no specific acoustic treatments.

It is therefore considered that the apartments have been designed to *protect residents from potential adverse impacts, not cause unreasonable interference through noise, provide a high standard of amenity, and respond to acoustic conditions to maximise comfort*, thereby achieving the relevant provisions of the Development Plan related to road and rail noise, and environmental noise.

APPENDIX A: Proposed development site locality.

