Lion Brewery Site

Code Amendment

Environmental Noise Assessment

S6805C3

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INTRODUCTION

An environmental noise assessment has been made of the proposed Planning and Design Code Amendment (**Code Amendment**) for the former Lion Brewery site at Thebarton.

The Affected Area is proposed to be rezoned for a combination of residential and commercial development. It is anticipated that the future development may comprise of a variety of buildings over the Affected Area, including multi-storey residential buildings, terraced houses, mixed-use residential buildings, commercial buildings, and potentially service trade premises. In addition, a series of open space areas and pedestrian friendly streets are anticipated, as well as the retention of various heritage assets within the Affected Area.

There are existing noise sources in the vicinity of the Affected Area with the potential to impact on the amenity of any future residences, should the Code Amendment proceed. These include traffic on Port Road and Adam Street, aircraft flying overhead, and existing commercial facilities adjacent to the Affected Area, such as the Bloom restaurant located to the west. In addition, consideration has also been given to the noise from the anticipated commercial portions of the development.

The environmental noise assessment considers the existing provisions of the South Australian Planning and Design Code (the **Code**) and demonstrates that reasonable levels of amenity can be achieved through implementing the existing provisions and assessment pathways.

Road traffic and aircraft noise are assessed against the provisions within the Code and referenced standard. Examples of the likely acoustic treatments to achieve the Code provisions have been provided to demonstrate that through practical building techniques and material selections, adequate levels of residential amenity can be achieved within the Affected Area.

An inspection of the Affected Area and surrounds, conducted on 10 May 2022, identified existing land uses adjacent the Affected Area that may have an impact on the amenity at future residences. Consideration has therefore also been given to the potential noise generated by activity at anticipated commercial premises and the impact this may have at existing residences identified near the Affected Area.

The assessment ensures that each of the noise sources is adequately accounted for within the Code Amendment and that adequate levels of residential amenity can be achieved, both within and outside of the Affected Area.

AFFECTED AREA & SURROUNDS

The Affected Area is currently located predominantly within a Strategic Employment Zone of the South Australian Planning and Design Code (the **Code**). Portions of the Affected Area are also located within an Open Space Zone and Urban Corridor (Business) Zone of the Code.

The proposal seeks to change the zoning of the majority of the Affected Area to the Urban Corridor (Boulevard) Zone, or other similar zone, such as the Urban Neighbourhood Zone. It is understood that the portion of the Affected Area within the Open Space Zone will remain zoned as such. The proposed change to the zoning is to accommodate a combination of low, medium, and high-rise built form, predominantly consisting of medium to high density housing and supportive retail and commercial land uses.

Potential land uses resulting from the Code Amendment include terraced housing, multi-storey residential buildings, mixed-use residential buildings, commercial and retail buildings, service trade premises, and both public and private open space.

The Affected Area is surrounded by the Urban Corridor (Business) Zone to the west, the Urban Corridor (Boulevard) Zone to the southeast, the Adelaide Park Lands Zone to the east, and the Suburban Activity Centre Zone to the North. The land to the south and west of the Affected Area is also located within a designated area of the Noise and Air Emissions Overlay (the **Overlay**) of the Code. The major roads to the east and the north of the Affected Area are also designated as 'Type A' roads within the Code. The southeast portion of the Affected Area is also designated as an area affected by aircraft noise, as per the Code.

The contemporary method for determining appropriate treatments for the noise from sources such as traffic, aircraft, and mixed-use areas is the *Ministerial Building Standard MBS 010 Construction requirements for the control of external sound* (**MBS 010**). The requirements of MBS 010 are mandatory at the Building Rules Consent stage for all residential developments located within a designated area of the Overlay. To this end, it is recommended that the Affected Area be included in the Overlay to ensure that sufficient acoustic treatments are provided for any future residences in the area. For the purpose of this assessment, it has been assumed that the Affected Area will be included in the Overlay. The specific requirements resulting from this are covered below.

TRAFFIC NOISE

The Affected Area is located adjacent to two major roads, namely Port Road to the east and Adam Street to the North. Consideration has been given to the noise from these roads to the proposed future residences within the Affected Area.

As noted above, MBS 010 is the contemporary method for assessing the noise impacts of traffic on residential development. MBS 010 "contains provisions for reducing the intrusion of unacceptable levels of sound into habitable rooms of residential buildings". With the Affected Area included in the Overlay, the requirements of MBS 010 will be mandatory at the Building Rules Consent stage.

The roads surrounding the Affected Area are both designated as 'Type A' roads, as per the Code, with a posted speed limit of 60 km/h in both cases. MBS 010 provides the following recommendations for building upgrades to address the noise from traffic at any future residences.

MBS 010 specifies acoustic treatment to dwellings based on the "Sound Exposure Category" (SEC) of specific facades. The SECs range from 1 to 5, with SEC 1 requiring a base level of acoustic treatment and SEC 5 requiring specific extensive treatment. The treatments are based on achieving a level of no more than 35 dB(A) inside a bedroom at night and therefore the SEC's account for varying levels of noise outside.

The SEC will vary based on a number of factors, including the distance from the road corridor, shielding provided by other structures, and the speed limit and designation of the road. The image below indicates the highest SEC applicable for various parts of the Affected Area. It is noted that the category for individual buildings and floors may differ based on the final layout of the Affected Area and the influence of other surrounding structures.

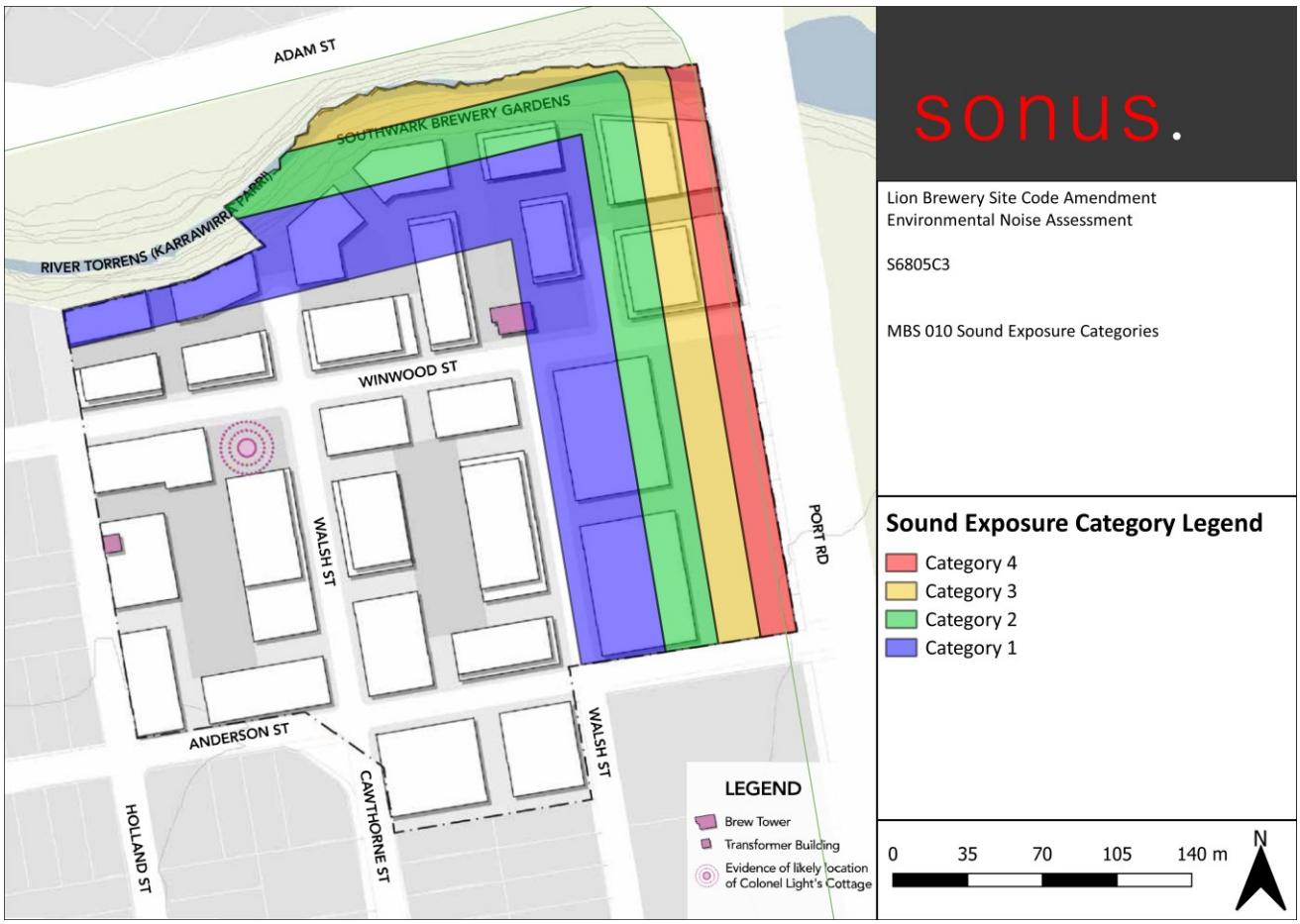

Figure 1: *Traffic noise sound exposure categories.*

The extent of treatment for each SEC, determined in accordance with MBS 010, will vary depending on the final design of buildings and the separation from roads. These treatments will be influenced by factors such as the size of the space, the amount of glazing, and the proposed construction materials. Appendix A of this report provides example treatments for each of the SECs. The treatments demonstrate that the provisions of MSB 010 can be achieved with practical building upgrades. The final extent of treatment will be determined at the Building Rules Consent stage for the particular residences.

AIRCRAFT NOISE

A portion of the Affected Area is located within the Australian Noise Exposure Forecast (**ANEF**) 20 contour, indicating that there is the potential for the Affected Area to be impacted by aircraft noise. MBS 010 also contains provisions for sites that are affected by aircraft noise and recommends different SECs depending on the severity of the noise.

In order to determine the SEC for a future residence with regard to aircraft noise, consideration needs to be given to the ANEF and Aircraft Noise Reduction (**ANR**) contours that the future residence falls within. In this case, the southeast portion of the Affected Area falls within the ANEF 20 contour, while no part of the Affected Area falls within an ANR contour. This can be seen in the below figure, taken from the SA Property and Planning Atlas (**SAPPA**).

Figure 2: *Aircraft noise contours.*

MBS 010 only requires acoustic treatments to dwellings that are located within both an ANEF and ANR contour. As the Affected Area is not within an ANR contour, no acoustic treatments are required in accordance with MBS 010.

PROPOSED COMMERCIAL USES

The Code provides a shared responsibility for noise at the interface of commercial and residential land uses in a mixed-use area such as that proposed for the Affected Area.

MBS 010 provides requirements for the attenuation of noise into residences located within a mixed-use area. Provided that the Affected Area is included in the Overlay, MBS 010 requires a minimum of SEC 1 treatments to all residents within a mixed-use area. Once again, examples of these treatments can be seen in Appendix A.

In addition, the Development Application for each of the commercial land uses is required to consider the potential impact on existing and future residential land uses. At the time of future Development Applications, measures to reduce the noise from the commercial land uses will be considered in accordance with the *Environment Protection (Noise) Policy 2007*. The resultant measures typically include:

- Placement of noise sources away from dwelling locations;
- Barriers between noise sources and dwellings;
- Selection of low noise plant and equipment; and
- Restriction of high noise activity if sufficient attenuation measures cannot be incorporated.

The shared responsibility in the design of commercial land uses and dwellings, which is already contemplated by the Code, will result in an appropriate level of acoustic amenity at future dwellings in the vicinity of commercial land uses.

Based on an inspection of the surrounding area conducted on 10 May 2022, the nearest existing residences to the Affected Area are understood to be located on Phillips Street to the southwest of the Affected Area. These residences are located approximately 200m from the Affected Area within the Urban Corridor (Business) Zone, with various other structures located between the residences and the Affected Area. As commercial activity on the Affected Area will be required to meet the goal noise levels of the Policy at the residential locations on the Affected Area, even lower noise levels will be achieved at existing residences (given the separation distance). It can therefore be determined that any future commercial activities proposed for the Affected Area will not have any adverse impacts on the amenity of the neighbouring and proximate land uses.

EXISTING COMMERCIAL USES

Consideration has also been given to the noise from existing commercial land uses in the vicinity of the Affected Area and the impact that the noise may have on the proposed residences. To this end, an inspection of the Affected Area and surrounding area was conducted on 10 May 2022. This inspection identified some noise sources in the vicinity of the Affected Area that have the potential to affect the amenity at the future residences. The closest of these sources are the Bloom restaurant and Warehouse Gym, located adjacent the Affected Area on the opposite side of Holland Street to the west. Other commercial uses in the vicinity include dance studios, signwriters, mechanics, and a dog day care facility.

Any future residences will need to consider these noise sources in accordance with the following Interface between Land uses Performance Outcome 1.1 of the Code.

> *Sensitive receivers are designed and sited to protect residents and occupants from adverse impacts generated by lawfully existing land uses (or lawfully approved land uses) and land uses desired in the zone.*

Further, with the Affected Area within the Noise and Air Emissions Overlay, all future residences will be required to upgrade facades to achieve a minimum of SEC 1 treatments. These two requirements will result in suitable noise levels inside future residences.

As an example, consideration has been given to noise from patrons at Bloom restaurant. Due to the proximity to the Affected Area and the expected level of noise produced, it is anticipated that this has the greatest potential for impact on the noise level at the Affected Area. It is understood that Bloom currently has approval to have up to 250 patrons within the outdoor areas and it is this number that has been used for this indicative assessment. The highest predicted noise level at the Affected Area from restaurant activity is 56 dB(A). Assuming a minimum of SEC 1 treatments to the facades of these buildings, it is expected that the noise level will be less than 30 dB(A) within future residences. An indoor level of 30 achieves the requirements of the Policy and would protect the amenity at the residence and would protect the continuing lawful operation of the restaurant.

SUMMARY

An environmental noise assessment has been made of the proposed Planning and Design Code Amendment for the former Lion Brewery Site at Thebarton.

There are a number of noise sources, both on and in the vicinity of the proposed land, with the potential to impact on any future residences, including the following:

- traffic on Port Road and Adam Street;
- aircraft flying over the Affected Area;
- future mixed-use land uses on the Affected Area; and,
- existing commercial uses adjacent to the Affected Area.

It is recommended that the Code Amendment contain a provision to designate the entire Affected Area within the Noise and Air Emissions Overlay of the Planning and Design Code. This will ensure that the requirements of the Ministerial Building Standard MBS 010 are mandatory at the Building Rules Consent stage for future residences. The provisions within MBS 010 will ensure that sufficient acoustic treatments are incorporated into the facade of the residential buildings to address:

- the influence of traffic noise into those residences;
- the potential influence of aircraft noise; and
- the interface with future mixed-use land uses on the Affected Area.

In addition, the impact of the existing commercial uses adjacent to the Affected Area has been considered. With the Affected Area within the Noise and Air Emissions Overlay, future residences will need to be designed to achieve the requirements of MBS 010 and Interface between Land Uses Performance Outcome 1.1. These measures will ensure that reasonable levels of residential amenity are achieved at future residences and that existing lawful activities are protected from future action.

Consideration has also been given to the impact that future commercial uses within the Affected Area may have at existing residences located in the nearby zones. Development Applications for any commercial uses will be required to ensure that sufficient acoustic treatments are incorporated to protect the amenity of existing residences in the vicinity, in accordance with the existing requirements of the Planning and Design Code. Suitable noise levels are expected to be readily achievable given the distance between the Affected Area and these residences.

The assessment has been based on the existing assessment pathways of the Planning and Design Code and demonstrates that by designating the Affected Area in the Noise and Air Emissions Overlay, a suitable level of amenity for future and existing residences will be achieved and existing lawful activities will be protected from future action.

APPENDIX A: Example MSB 010 Treatments based on Sound Exposure Category

Sound Exposure Category 4

An example of Sound Exposure Category 4 treatments are detailed below. It is noted that the glazing requirements are heavily dependent on the size and layout of the space. For the purpose of providing these example recommendations, it has been assumed that glass will be provided to the equivalent of 40-60% of the floor area.

Table 4: Sound Exposure Category 4

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS OF MBS 010	
	Room	***Requirement***
Windows and glazed doors	*Bedrooms (including attached non-habitable rooms)*	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 12.5mm thick laminated glass as fixed panes, awning, or casement windows. • Note that external glass doors are not permitted in bedrooms.
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 12.5mm thick laminated glass in sliding doors; • minimum 10.5mm thick laminated glass as fixed panes, awning or casement windows, or side hung doors.
External walls	*All habitable rooms*	Ensure external walls are the acoustic equivalent of: • a minimum 150mm thick concrete panelling; OR; • a brick veneer construction incorporating: o single leaf of minimum 90mm thick brick; o a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; o 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; o one layer of 10mm thick plasterboard fixed to the inside face.
Roof and ceiling systems	*Bedrooms*	Ensure the roof is sheet metal or tile, and ceilings are constructed from 2 layers of 13mm thick fire rated plasterboard fixed to furring channels under the truss and with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.
	All habitable rooms other than Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 16mm thick fire rated plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.
Ventilation	*All*	A mechanical ventilation system should be provided in compliance with the relevant Australian Standard (AS 1668.2). Relief air paths must be fully ducted and the fresh air inlets and where practical the exhaust air outlets must be at a point on the building furthest from a designated sound source.
External Doors (other than external glazed doors)	*All habitable rooms other than Bedrooms*	Ensure external doors are a minimum 40mm thick solid core, fully fitted with Raven “RP8” and “RP10” (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door. Note external doors are not permitted in bedrooms.
Ground Floor	*All habitable rooms*	Ensure the dwelling is constructed on a concrete slab with a minimum thickness of 150mm.

Sound Exposure Category 3

An example of Sound Exposure Category 3 treatments are detailed below. It is noted that the glazing requirements are heavily dependent on the size and layout of the space. For the purpose of providing these example recommendations, it has been assumed that glass will be provided to the equivalent of 40-60% of the floor area.

Table 4: Sound Exposure Category 3

BUILDING ENVELOPE ELEMENT	**ACOUSTIC REQUIREMENTS OF MBS 010**	
	Room	***Requirement***
Windows and glazed doors	*Bedrooms (including attached non-habitable rooms)*	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 12.5mm thick laminated glass in sliding doors; • minimum 10.5mm thick laminated glass as fixed panes, awning or casement windows, or side hung doors.
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10.5mm thick laminated glass in sliding doors and windows; • minimum 10mm thick glass as fixed panes, awning or casement windows, or side hung doors.
External walls	*All habitable rooms*	Ensure external walls are the acoustic equivalent of: • a minimum 150mm thick concrete panelling; OR; • a brick veneer construction incorporating: o single leaf of minimum 90mm thick brick; o a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; o 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; o one layer of 10mm thick plasterboard fixed to the inside face.
Roof and ceiling systems	*Bedrooms*	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 16mm thick fire rated plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.
	All habitable rooms other than Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.
Ventilation	*All*	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.
External Doors (other than external glazed doors)	*All habitable rooms*	Ensure external doors are a minimum 40mm thick solid core, fully fitted with Raven “RP8” and “RP10” (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door.
Ground Floor	*All habitable rooms*	Ensure the dwelling is constructed on a concrete slab with a minimum thickness of 150mm.

Sound Exposure Category 2

An example of Sound Exposure Category 2 treatments are detailed below. It is noted that the glazing requirements are heavily dependent on the size and layout of the space. For the purpose of providing these example recommendations, it has been assumed that glass will be provided to the equivalent of 40-60% of the floor area.

Table 5: Sound Exposure Category 2

BUILDING ENVELOPE ELEMENT	**ACOUSTIC REQUIREMENTS OF MBS 010**	
	Room	***Requirement***
Windows and glazed doors	*Bedrooms (including attached non-habitable rooms)*	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10.5mm thick laminated glass in sliding doors or windows; • minimum 10mm thick glass as fixed panes, awning or casement windows, or side hung doors.
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors or windows; • minimum 6mm thick glass as fixed panes, awning or casement windows, or side hung doors.
External walls	*All habitable rooms*	Ensure external walls are the acoustic equivalent of: • a minimum 150mm thick concrete panelling; OR; • a brick veneer construction incorporating: o single leaf of minimum 90mm thick brick; o a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; o 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; o one layer of 10mm thick plasterboard fixed to the inside face. OR; • a Hebel construction incorporating: o a row of minimum 90mm thick steel studwork; o 75mm thick Hebel Powerpanel fixed to the studwork with minimum 50mm thick top hats; o 90mm thick insulation with a density of 13kg/m^3 between the studwork; and, o two layers of 13mm thick fire-rated plasterboard fixed to the inside face.
Roof and ceiling systems	*Bedrooms*	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.
Ventilation	*All*	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.
External Doors (other than external glazed doors)	*All habitable rooms*	Ensure external doors are a minimum 35mm thick solid core, fully fitted with Raven “RP8” and “RP10” (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door.
Ground Floor	*All habitable rooms*	Ensure the dwelling is constructed on a concrete slab with a minimum thickness of 150mm.

Sound Exposure Category 1

An example of Sound Exposure Category 1 treatments are detailed below. It is noted that the glazing requirements are heavily dependent on the size and layout of the space. For the purpose of providing these example recommendations, it has been assumed that glass will be provided to the equivalent of 40-60% of the floor area.

Table 6: Sound Exposure Category 1

BUILDING ENVELOPE ELEMENT	**ACOUSTIC REQUIREMENTS OF MBS 010**	
	Room	***Requirement***
Windows and glazed doors	*Bedrooms (including attached non-habitable rooms)*	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors or windows; • minimum 6mm thick glass as fixed panes, awning or casement windows, or side hung doors.
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Ensure a minimum 6mm thick glass is incorporated into systems that can be sealed airtight when closed.
External walls	*All habitable rooms*	Ensure external walls are the acoustic equivalent of: • a minimum 150mm thick concrete panelling; OR; • a brick veneer construction incorporating: o single leaf of minimum 90mm thick brick; o a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; o 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; o one layer of 10mm thick plasterboard fixed to the inside face. OR; • a Hebel construction incorporating: o a row of minimum 90mm thick steel studwork; o 75mm thick Hebel Powerpanel fixed to the studwork with minimum 50mm thick top hats; o 90mm thick insulation with a density of 13kg/m^3 between the studwork; and, o one layer of 13mm thick plasterboard fixed to the inside face. OR; • a lightweight construction incorporating: o a row of minimum 90mm thick studwork; o minimum 9mm thick fibre cement sheeting fixed to the outside of the studs; o 75mm thick insulation with a minimum density of 11kg/m^3 between the studwork; and, o two layers of 16mm thick fire-rated plasterboard fixed to the inside face.
Ventilation	*All*	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.