



Department of
Planning



State Planning Policy 5.3

Land Use Planning in the Vicinity of Jandakot Airport

January 2017

*Prepared under Part Three of the Planning and Development Act 2005
by the Western Australian Planning Commission*

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CONTENTS

[click to follow](#)

1.	CITATION	1	APPENDIX 1 - BUILDING SITE ACCEPTABILITY	9
2.	INTRODUCTION AND BACKGROUND	1	APPENDIX 2 - INDOOR DESIGN SOUND LEVELS	10
2.1	Importance of Jandakot Airport	1	APPENDIX 3: NOTIFICATION ABOUT AIRCRAFT NOISE TO BE PLACED ON PROPERTY TITLE	11
2.2	Aircraft noise measurement	1	FIGURE 1: FRAME AREA	12
2.3	Australian Noise Exposure Forecast	1	GLOSSARY OF TERMS	13
2.4	Policy measures	1	REFERENCES	13
3.	APPLICATION OF THE POLICY	1		
3.1	Other policies that relate to this policy	1		
4.	POLICY OBJECTIVES	2		
5.	POLICY MEASURES	2		
5.1	Interpretation	2		
5.2	Areas below 20 ANEF	2		
5.3	Areas between 20 ANEF and 25 ANEF	3		
5.4	Areas above 25 ANEF	4		
6.	IMPLEMENTATION	7		
6.1	Zoning and density coding	7		
6.2	Subdivision control	7		
6.3	Development control	7		
6.4	Referral arrangements	7		
6.5	Notification and advice	8		



1. CITATION

This is a State planning policy prepared under section 26 of the *Planning and Development Act, 2005*. It may be cited as *State Planning Policy 5.3: Land Use Planning in the Vicinity of Jandakot Airport*. For the purpose of this document it will be referred to as 'the policy'.

2. INTRODUCTION AND BACKGROUND

2.1 Importance of Jandakot Airport

Opened in 1963, Jandakot Airport is the principal general aviation airport in Western Australia. It is one of the busiest airfields and largest pilot training bases in Australia, and operates 24 hours per day, seven days per week.

The airport is an important element of transport infrastructure, servicing both the region and the State as a whole. It also makes a significant contribution to the economy of the area in which it is situated, providing employment and a range of local economic opportunities. The strategic importance of Jandakot Airport supports the need for it to be recognised in the planning of the region, and for its operation to be protected as far as practicable, from development that could potentially prejudice its performance. At the same time however, it is important to recognise the physical context in which the airport is situated; and to minimise as far as practicable, adverse impacts on adjacent development such as aircraft noise.

2.2 Aircraft noise measurement

The system of aircraft noise measurement, which has traditionally been used in Australia for the purposes of evaluating land use compatibility, is known as the Australian Noise Exposure Forecast (ANEF) system. This system is employed to produce the following noise measures, which are usually illustrated in the form of noise exposure contours:

- ANEF—being a noise exposure *forecast* for a particular time in the future or based on particular circumstances such as ultimate capacity; and
- ANEI—being a noise exposure *index* based on data for a previous year where the exact numbers and types of aircraft that used the airport are known.

2.3 Australian Noise Exposure Forecast

This policy is predicated upon the ANEF as prepared by Jandakot Airport Holdings and endorsed for technical accuracy by Airservices Australia, which is incorporated by reference into this policy. A copy of the current ANEF can be found on the Jandakot Airport website and is a requirement of the *Airports Act 1996*. The noise modelling that determines the ANEF contours may be reviewed every five years in association with reviews of the master plan for Jandakot Airport. The updated ANEF, as amended, resulting from such reviews will be automatically included in this policy as amended by reference. Updates to the ANEF are subject to consultation with State and local government agencies by Jandakot Airport Holdings. The effect of amendments to the ANEF may include alterations to the areas of land to which this policy applies.

2.4 Policy measures

The policy measures have been based on Table 2.1 from AS2021 – *Building Site Acceptability Based on ANEF Zones*, as amended. However, the policy measures included in this policy provide more definitive guidance on those matters identified as discretionary in AS2021. It should be noted that AS2021 is advisory, and has no direct statutory application.

3. APPLICATION OF THE POLICY

This policy applies to land in the vicinity of Jandakot Airport, which is, or may be in the future affected by aircraft noise associated with the movement of aircraft. Policy measures in Section 5 apply to the land within the 20 ANEF contour and frame area.

3.1 Other policies that relate to this policy

Other policies and planning instruments relevant to the implementation of this policy should be considered as appropriate.

Land within Jandakot Airport is reserved by the Metropolitan Region Scheme for 'Public Purposes' and 'Water Catchments', while land in the vicinity of the Jandakot Airport is predominantly zoned 'Rural – Water Protection'. The policy provisions within *State Planning Policy 2.5 – Land Use Planning in Rural areas* and *State Planning Policy 2.3 – Jandakot Groundwater Protection Policy* should be considered where applicable.



4. POLICY OBJECTIVES

The objectives of this policy are to:

- protect Jandakot Airport from encroachment by incompatible land use and development so as to provide for its ongoing, safe, and efficient operation; and
- minimise the impact of airport operations on existing and future communities, with reference to aircraft noise.

5. POLICY MEASURES

5.1 Interpretation

ANEF level

Refers to the level of noise exposure forecast under the ANEF. Noise exposure contours are illustrated at intervals of five ANEF units beginning at 20 ANEF and ranging up to 40 ANEF, with 40 being closest to the runways.

Noise exposure zone

Refers to the areas within a specified range of noise exposure levels as illustrated on the current ANEF endorsed by Airservices Australia for technical accuracy. Noise exposure zones referred to in this policy include:

- areas below 20 ANEF;
- areas between 20 ANEF and 25 ANEF; and
- areas above 25 ANEF.

In the case of sites that are dissected by a noise exposure contour, the following interpretations shall apply:

- (i) where the site has an area less than 1,000m² the noise exposure for the whole site shall be deemed to be the level to which the majority of the site is subject; and
- (ii) where the site has an area greater than 1,000m² the noise exposure shall be determined separately for the individual parts of the site into which it is divided by the relevant noise exposure contour.

Building site acceptability

Refers to the acceptability of sites for particular building types within various ANEF zones. *Appendix 1* includes a classification of building site acceptability. Development types are classified as 'Acceptable', 'Conditionally Acceptable' or 'Unacceptable' depending on the sensitivity of associated use or occupation of the building and the level of noise exposure forecast for the site.

AS2021 recognises that the exposure prediction below 25 ANEF may be inaccurate, and therefore caution should be exercised in the evaluation of locations for noise sensitive premises outside the 25 ANEF contour. In these instances it may be appropriate to undertake supplementary noise measurements so that a sufficiently representative prediction of the noise exposure at the site under evaluation can be obtained and mitigated, if required.

Frame area

This area is defined by Roe Highway, Ranford Road, Warton Road, Armadale Road and the Kwinana Freeway (see Figure 1), but does not include areas within the ANEF contours.

5.2 Areas below 20 ANEF

There is no restriction on zoning or development within this noise exposure zone under this policy, which is identified as 'Acceptable' for all building types in the building site acceptability table in *Appendix 1*. According to AS2021 however, noise nuisance may still be experienced in areas below the 20 ANEF exposure level, particularly in the case of newly exposed communities.

5.2.1 Frame area

Given noise nuisance may still be experienced below the 20 ANEF exposure level and that Jandakot Airport is a general aviation airport which undertakes significant pilot training, a frame area has been identified (Figure 1). There is no restriction on zoning or development within the frame area which is outside the 20 ANEF exposure level.

It is noted that the ANEF contours may exceed the frame area. The appropriate noise exposure zone applies in these areas and the corresponding policy measures should be applied as required for that noise exposure zone.

5.2.2 Notification on title

A 'notice on title' pursuant to s70a of the *Transfer of Land Act 1893* advising of the potential for noise nuisance is to be required as a condition of any subdivision or planning approval, within the frame area. *Standard wording to be used in notices on title is included in Appendix 3.*



5.2.3 Advice

- (1) Information should be given to prospective purchasers of noise-sensitive premises about the potential for aircraft noise nuisance. Such advice should be provided by local government in conjunction with the issue of zoning certificates and/or property inquiries.
 - (2) Advice should be provided, in association with applications for planning approval and building permits, of the potential for noise nuisance and any noise attenuation requirements. Developers should also be made aware of the benefits of window closure and the associated need for forced ventilation.
 - (3) Information about aircraft types and the timing and frequency of aircraft operations is available from the Jandakot Airport website. AS2021 includes tables of noise levels for selected aircraft types and locations, in terms of distance, in specific proximity to airport runways.
- (2) Caution should be exercised when determining whether an increase in sensitive land uses is acceptable. Land uses that provide for the building types identified as 'Conditionally Acceptable' with reference to the building site acceptability table in *Appendix 1*, should be subject to discretionary control under local planning schemes. Building types include:
 - dwellings and caravan parks
 - educational establishments
 - child-care premises
 - hospitals and nursing homes
 - places of worship
 - cinemas, theatre and exhibition centres.
 - (3) It is not intended that this policy would affect the existing zoning or use of land.

5.3.2 Residential density

Residential uses are 'Conditionally Acceptable' within 20 – 25 ANEF and consideration should be given to the suitability of such uses within this noise exposure zone.

Where land is zoned for residential purposes or to permit residential development, the maximum dwelling density should generally be limited to R20, except where:

- land is identified as appropriate for more intensive development through strategic planning instruments such as a regional or sub-regional structure plan;
- a higher density coding is desirable to facilitate redevelopment or infill development of an existing residential area; and

- it can be demonstrated that the public benefits of higher density coding outweigh the negative impacts of exposing additional residents to aircraft noise.

5.3.3 Subdivision and strata subdivision

- (1) Subdivision and/or strata subdivision may be approved, provided it is consistent with the zoning and density coding of the land under the local planning scheme, local structure plan or local development plan.
- (2) Where no density coding is prescribed for 'Residential' zoned land, the maximum density should generally be limited to R20, except as provided for in relation to the application of residential density controls under clause 5.3.2.

5.3.4 Development

- (1) Development may be approved provided it is consistent with the zoning, development control and density coding of the land under the local planning scheme, local structure plan or local development plan.
- (2) In the case of development that is subject to discretionary control under a local planning scheme (as provided for under clause 5.3.1), the impact of aircraft noise on the users or occupiers of the development should be taken into consideration in the determination of applications, and where relevant, in the imposition of conditions of approval. In some cases, a noise assessment and associated management plan may be required prior to the determination of an application.

5.3 Areas between 20 ANEF and 25 ANEF

5.3.1 Zoning

- (1) Zoning and associated development control provisions should take into consideration the level of noise exposure forecast for the area and the building site acceptability for the particular noise exposure zone as identified in *Appendix 1*. This includes structure planning which guides subdivision and development. Caution should be exercised when considering whether to facilitate the increase of sensitive land uses within this zone.



- (3) Where no density coding is prescribed for 'Residential' zoned land, the maximum density should generally be limited to R20, except as provided for in relation to the application of residential density controls under clause 5.3.2.

5.3.5 Noise attenuation

- (1) Noise attenuation is not mandatory for residential uses within this noise exposure zone. Some areas however, may experience aircraft noise levels in excess of the Indoor Design Sound Levels specified in AS2021, and noise attenuation is recommended in such cases. Guidance on noise insulation measures are contained within the Western Australian Planning Commission report, *Aircraft Noise Insulation for Residential Development in the Vicinity of Perth Airports, 2004*.
- (2) Noise attenuation requirements for uses other than residential that is identified as 'Conditionally Acceptable' in the building site acceptability table in *Appendix 1*, should be determined in consideration of:
 - levels of aircraft noise likely to be experienced at the site;
 - likely noise attenuation from the type of construction proposed;
 - background noise level to which the site is subject;
 - times of day or night when overflights are likely to occur;
 - frequency of overflights by the various classes of aircraft; and

- occupational characteristics of the proposed development.

- (3) Closure of windows and other openings to habitable rooms can significantly reduce the intrusion of aircraft noise. This will normally require forced ventilation and may also necessitate some form of active cooling, such as refrigerated air conditioning. The operational management of buildings however, is outside the ambit of this policy and will therefore be subject only to advice. (Refer clause 5.3.7)

5.3.6 Notification on title

A 'notice on title' advising of the potential for noise nuisance is to be required as a condition of any subdivision or planning approval within this noise exposure zone. Standard wording to be used in notices on title is included in *Appendix 3*.

5.3.7 Advice

- (1) Information should be given to prospective purchasers of noise-sensitive premises, about the potential for aircraft noise nuisance. Such advice should be provided by local government in conjunction with the issue of zoning certificates and/or property inquiries.
- (2) Advice should be provided, in association with applications for planning approval and building permits, of the potential for noise nuisance and any noise attenuation requirements or recommendations in accordance with the provisions of clause 5.3.5. Developers should also be made aware of the benefits of window closure and the associated need for forced ventilation.

- (3) Information about aircraft types and the timing and frequency of aircraft operations is available from the Jandakot Airport website. AS2021 includes tables of noise levels for selected aircraft types and locations, in terms of distance, in specific proximity to airport runways.

5.4 Areas above 25 ANEF

5.4.1 Zoning

- (1) Zoning and associated development control provisions should take into consideration the level of noise exposure forecast for the area and the building site acceptability for this particular noise exposure zone as identified in *Appendix 1*. This includes structure planning which guides subdivision and development.
- (2) There is a presumption against zoning which may permit development involving building types identified as 'Unacceptable', with reference to the building site acceptability table in *Appendix 1*. This includes residential, rural-residential or special rural zoning where the predominant type of development is likely to be housing.
- (3) Where land has already been zoned to permit development involving building types identified as 'Unacceptable', and where in the opinion of local government it is not practicable to allocate the land for alternative uses, existing zoning may remain.¹

¹ Australian Standard 2021 recognises that many non-aviation factors have to be taken into account in decisions about land use, and that where established residential development exists, it is generally not appropriate to apply the recommended land use compatibility criteria unless the opportunity for re-zoning arises.



- (4) Land uses that provide for development of building types identified as either 'Conditionally Acceptable' or 'Unacceptable' in the building site acceptability table in *Appendix 1*, should be subject to discretionary control under local planning schemes. Such development includes:

- dwellings and caravan parks
- educational establishments
- child-care premises
- hospitals and nursing homes
- places of worship
- cinemas, theatres and exhibition centres
- hotels and motels
- residential buildings
- offices and shops
- medical centres
- restaurants.

- (5) Requests for amendments to local planning schemes that would facilitate an increase in the number of noise-sensitive premises should not be supported.

- (6) Under no circumstances should 'Rural' or other non-residential zoned land be rezoned for residential development or any other form of development involving building types identified as 'Unacceptable' in the building site acceptability table in *Appendix 1*.

- (7) In considering the practicability of alternative land uses, local government should give particular emphasis to areas forecast to be affected by noise exposure levels above 30 ANEF.

- (8) It is not intended that this policy would affect the existing zoning or use of land.

5.4.2 Residential density

- (1) Where alternative (non-residential) zoning of existing 'Residential' zoned land is not practicable, the density of development should generally be limited to R12.5. Possible exceptions are where:
- land is identified as appropriate for more intensive development through strategic planning instruments such as a regional or sub-regional structure plan;
 - it can be demonstrated that the public benefits of higher density coding outweigh the negative impacts of exposing additional residents to aircraft noise; and
 - a higher density would facilitate the concurrent provision of noise attenuation in accordance with the indoor design sound levels prescribed in AS2021.
- (2) In areas subject to noise exposure levels above 25 ANEF, the permissible density of existing residential development should generally not be increased.

5.4.3 Subdivision and strata subdivision

- (1) No further subdivision or strata subdivision is to take place where it would result in an increase in the number of dwellings that may be developed, unless it is consistent with the zoning and density coding of the land under a local planning scheme.
- (2) Where no density coding or minimum lot size is prescribed for 'Residential' zoned land, the maximum

density should generally be limited to R12.5, except as provided for in relation to the application of residential density controls under clause 5.4.2.

5.4.4 Development

- (1) No further development is to take place where it would result in an increase in the number of people likely to be accommodated, unless it is consistent with the zoning and density coding of the land.
- (2) In the case of development that is subject to discretionary control under an operative local planning scheme (as provided for under clause 5.4.1), the impact of aircraft noise on the users or occupiers of the development should be taken into consideration in the determination of applications and where relevant, in the imposition of conditions of approval. In some cases, a noise assessment and associated management plan may be required prior to the determination of an application.
- (3) Where no density coding is prescribed for 'Residential' zoned land, the maximum density should generally be limited to R12.5, except as provided for in relation to the application of residential density controls under clause 5.4.2.

5.4.5 Noise attenuation

- (1) Noise attenuation is required as a condition of planning approval for all development involving building types identified as 'Unacceptable', with reference to the building site acceptability table in *Appendix 1*. In exceptional circumstances, noise attenuation may be required for building types identified as 'Conditionally Acceptable'.



- (2) Noise attenuation requirements for development involving building types identified as 'Conditionally Acceptable' in the building site acceptability table in *Appendix 1*, should be determined in consideration of the:
 - levels of aircraft noise likely to be experienced at the site;
 - likely noise attenuation from the type of construction proposed;
 - background noise level to which the site is subject;
 - times of day or night when overflights are likely to occur;
 - frequency of overflights by the various classes of aircraft; and
 - occupational characteristics of the proposed development.
- (3) Where practicable, the standard of attenuation required should be based on achievement of indoor design sound levels recommended for the particular building type or activity in AS2021. (Refer to *Indoor Design Sound Levels for Determination of Aircraft Noise Reduction* in *Appendix 2*). In some cases, a noise assessment and associated management plan may be required prior to the determination of an application.
- (4) Closure of windows and other openings to habitable rooms, which is necessary to achieve the benefits of noise attenuation, normally involves forced ventilation and may also necessitate some form of active cooling, such as refrigerative air conditioning. The operational management of buildings however,

is outside the ambit of this policy and will therefore be subject only to advice. (Refer clause 5.4.7).

- (5) Heritage listed buildings and pre-existing housing within a designated heritage area may also be exempt from the requirements for noise attenuation, as provided for under a local planning scheme.²
- (6) Minor additions to existing residential development involving no more than two habitable rooms and no more than a 25 per cent increase in habitable floor space should be exempted from the requirement for noise insulation.
- (7) Where more substantial additions are proposed, the additional areas should be insulated in accordance with the recommended indoor design sound levels of AS2021 or otherwise as provided for in sub-clause (3) above. Noise attenuation is not mandatory for existing areas of the house but is desirable and may, in some circumstances, be appropriate to meet the indoor design sound levels prescribed under AS2021 and/ or the variations provided for in sub-clause (3) above. According to AS2021, the requirement for different internal design sound levels for different indoor spaces could require the construction of substantial barriers between habitable spaces. Accordingly, consideration should be given to a uniform perimeter insulation approach.
- (8) Deemed-to-comply noise insulation specifications for residential development are contained within the Western Australian Planning Commission report, *Aircraft Noise Insulation for Residential Development in the Vicinity of Perth Airports 2004* (as amended).

5.4.6 Notification on title

A 'notice on title' advising of the potential for noise nuisance is to be required as a condition of any subdivision or planning approval within this noise exposure zone. Standard wording to be used in notices on title is included in *Appendix 3*.

5.4.7 Advice

- (1) Information should be given to prospective purchasers of noise-sensitive premises, about the potential for aircraft noise nuisance. Such advice should be provided by local government in conjunction with the issue of zoning certificates and/ or property inquiries.
- (2) Advice should be provided, in association with applications for planning approval and building permits, of the potential for noise nuisance and any noise attenuation requirements or recommendations in accordance with the provisions of clause 5.4.5. Developers should also be made aware of the benefits of window closure and the associated need for forced ventilation.
- (3) Information about aircraft types and the timing and frequency of aircraft operations is available from the Jandakot Airport website. AS2021 includes tables of noise levels for selected aircraft types and locations, in terms of distance, in specific proximity to airport runways.

² Local planning schemes prepared in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015* already provide for variations to development requirements where desirable to facilitate the conservation of heritage buildings or preservation of heritage values in a designated heritage area.



6. IMPLEMENTATION

It is intended that this policy be implemented using a combination of the following measures:

- zoning and density coding under the operative local planning scheme;
- subdivision control;
- development controls;
- referral arrangements; and
- notification and advice.

6.1 Zoning and density coding

- (1) Local government should have due regard to the objectives and policy measures outlined in Section 5 when reviewing local planning schemes. This relates to all land forecast to be affected by noise exposure levels above the 20 ANEF contour and/or within the frame area where applicable.
- (2) In those areas with potential for further subdivision or redevelopment, consideration should be given to ways in which the effects of aircraft noise can be reduced. Where practicable, noise-sensitive premises should be prohibited in noise exposure zones for which the relevant development or use is classified as 'Unacceptable' in the building site acceptability table in *Appendix 1*.

6.2 Subdivision control

- (1) The Western Australian Planning Commission is responsible for the control of subdivision under the *Planning and Development Act 2005*, and strata subdivision under the *Strata Titles Act 1985*. In exercising its discretion in relation to applications for subdivision and strata subdivision the Western Australian Planning Commission will have due regard to this policy.
- (2) Local government should also have due regard to this policy in making its recommendations to the Western Australian Planning Commission on applications for subdivision and those classes of strata subdivision for which the approval of the Commission is required, or in making its decision where local government is the delegated authority.

6.3 Development control

- (1) Where practicable, local governments should include special control areas, or other provisions, in local planning schemes, to provide an additional head of power to control development in areas within the 20 ANEF contour.
- (2) As well as being defined on local planning scheme maps, special control areas should provide for supplementary control of development in order to address the policy measures detailed in Section 5. Relevant provisions should include:
 - requirement for planning approval for all noise-sensitive development, particularly single houses;
 - discretionary provisions to enable applications to be refused where the development would be inconsistent with this policy;

- discretionary provisions to facilitate the imposition of conditions to address the requirements of this policy with respect to noise reduction; and
- discretionary provisions to facilitate the registration of notices on title where land is affected by aircraft noise above 20 ANEF.

6.4 Referral arrangements

Proposals involving any of the following should be referred by the relevant local government or in the case of subdivision, the Western Australian Planning Commission, to the operators of Jandakot Airport for comment and advice:

Scheme amendments

- Increase in density coding above R20 in areas between 20 ANEF and 25 ANEF.
- Changes of zoning and/or density coding in areas above the 25 ANEF noise exposure contour, which have the potential to enable an increase in population density.

Subdivision

- Subdivision of land for residential purposes, where the lot sizes would enable development at a density in excess of that provided for under this policy.

Development

- Development identified as 'Unacceptable' in the building site acceptability table in *Appendix 1*, with the exception of residential development, which accords with the density coding applicable under a local planning scheme.



- Development involving penetration of the prescribed airspace or other controlled activities as prescribed in the Airports (Protection of Airspace) Regulations 1996.
- Prescribed Airspace is defined under the *Airports (Protection of Airspace) Regulations, 1996* as the airspace above any part of either an Obstacle Limitation Surface (OLS) or Procedures for Air Navigation Systems Operations (PANS-OPS) surface. Details regarding prescribed airspace or controlled activities can be obtained from the Jandakot Airport website.

Land use

- Non-structural activities (artificial light, sunlight, emissions of smoke, dust and other particulate matter, and emissions of steam or other gas) subject to approval under the *Airports (Protection of Airspace) Regulations 1996*.
- Further information concerning referral and approval requirements under the Commonwealth legislation may be obtained from the Commonwealth Department of Infrastructure and Regional Development website.
- Use or development of land in the vicinity of the airport that is likely to attract significant numbers of birds and other wildlife. Information on this issue may be obtained from Jandakot Airport.

6.5 Notification and advice

- (1) Advice concerning the potential for noise nuisance can most effectively be administered by the relevant local government via property inquiries, zoning certificates and conditions of planning approval requiring notices on title. Standard wording to be used in notices on title is included in Appendix 3.
- (2) In the case of proposals involving land subdivision, the Western Australian Planning Commission has the principal role in the provision of advice to applicants and/or the registration of notices on title, where required.
- (3) The Jandakot Airport website (www.jandakotairport.com.au) provides information about aircraft noise and the operations of the airport.
- (4) Local governments may require proponents to ensure that adequate information about the potential for noise nuisance is provided to prospective property purchases to enable them to make a fully informed decision.



APPENDIX 1 - BUILDING SITE ACCEPTABILITY

(Adopted from AS2021, Table 2.1: Building Site Acceptability Based on ANEF Zones)

BUILDING TYPE	FORECAST NOISE EXPOSURE LEVEL (ANEF)			
	less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 2)	25 to 30 ANEF	30 to 35 ANEF
House, home unit, flat, caravan park	Acceptable	Conditionally acceptable*	Unacceptable (Note 4) (Note 5)	Unacceptable (Note 4) (Note 5)
School, university	Acceptable	Conditionally acceptable*	Unacceptable (Note 4) (Note 5)	Unacceptable (Note 4) (Note 5)
Hospital, nursing home	Acceptable	Conditionally acceptable*	Unacceptable (Note 4) (Note 5)	Unacceptable (Note 4) (Note 5)
Hotel, motel, hostel	Acceptable	Acceptable	Conditionally acceptable*	Unacceptable (Note 4) (Note 5)
Public building	Acceptable	Conditionally acceptable*	Conditionally acceptable*	Unacceptable (Note 4) (Note 5)
Commercial building	Acceptable	Acceptable	Conditionally acceptable*	Conditionally acceptable
Light Industrial	Acceptable	Acceptable	Acceptable	Conditionally acceptable
Other industrial	Acceptable	Acceptable	Acceptable	Acceptable

* Caution to be exercised

Relevant Notes from Table 2.1 of AS2021:

1. The actual location of the 20 ANEF contour is difficult to define accurately, mainly because of variation in aircraft flight paths. Therefore, the procedure of Clause 2.3.2 of AS2021 may be followed for building sites outside but near to the 20 ANEF contour.
2. Within 20 ANEF to 25 ANEF, some people may find that the land is not compatible with residential or educational uses. Land use authorities may consider that the incorporation of noise control features in the construction of residences or schools is appropriate.
3. There will be cases where a building of a particular type will contain spaces used for activities which would generally be found in a different type of building (e.g. an office in an industrial building). In these cases, Table 2.1 should be used to determine site acceptability, but internal design noise levels within the specific spaces should be determined by Table 3.3 (Appendix 2).
4. This Standard does not recommend development in unacceptable areas. However, where the relevant planning authority determines that any development may be necessary within existing built-up areas designated as unacceptable, it is recommended that such development should achieve the required ANR determined according to Clause 3.2 of AS2021. For residences, schools, etc., the effect of aircraft noise on outdoor areas associated with the buildings should be considered.
5. In no case should new development take place in greenfield sites deemed unacceptable because such development may impact airport operations.



APPENDIX 2 - INDOOR DESIGN SOUND LEVELS

(Excerpt from AS2021: Table 3.3)

Table 3.3 Indoor Design Sound Levels* for Determination of Aircraft Noise Reduction

Building type and activity	Indoor design sound level*, dB(A)
Houses, home units, flats, caravan parks	
Sleeping areas, dedicated lounges	50
Other habitable spaces	55
Bathrooms, toilets, laundries	60
Hotels, motels, hostels	
Relaxing, sleeping	55
Social activities	70
Service activities	75
Schools, universities	
Libraries, study areas	50
Teaching areas, assembly areas (see Note 5)	55
Workshops, gymnasias	75
Hospitals, nursing homes	
Wards, theatres, treatment and consulting rooms	50
Laboratories	65
Service areas	75
Public buildings	
Churches, religious activities	50
Theatres, cinemas, recording studios (see Note 4)	40
Court houses, libraries, galleries	50

Building type and activity	Indoor design sound level*, dB(A)
Commercial buildings, offices and shops	
Private offices, conference rooms	55
Drafting, open offices	65
Typing, data processing	70
Shops, supermarkets, showrooms	75
Industrial	
Inspection, analysis, precision work	75
Light machinery, assembly, bench work	80

Notes from Table 3.3 of AS2021:

* These indoor design sound levels are not intended to be used for measurement of adequacy of construction. For measurement of the adequacy of construction against aircraft noise intrusion see Appendix D of AS2021.

1. The indoor design sound levels in Column 2 are hypothesized values based on Australian experience. A design sound level is the maximum level (dB(A)) from an aircraft flyover which, when heard inside a building by the average listener, will be judged as not intrusive or annoying by that listener while carrying out the specified activity. Owing to the variability of subjective responses to aircraft noise, these figures will not provide sufficiently low interior noise levels for occupants who have a particular sensitivity to aircraft noise.

- Some of these levels, because of the short duration of individual aircraft flyovers, exceed some other criteria published by Standards Australia for indoor background noise levels (see AS2107).
- The indoor design sound levels are intended for the sole purpose of designing adequate construction against aircraft noise intrusion and are not intended to be used for assessing the effects of noise. Land use planning authorities may have their own internal noise level requirements which may be used in place of the levels above.
- For opera and concert halls and theatres, and for recording, broadcast and television studios and similar buildings where noise intrusion is unacceptable, specialist acoustic advice should always be obtained.

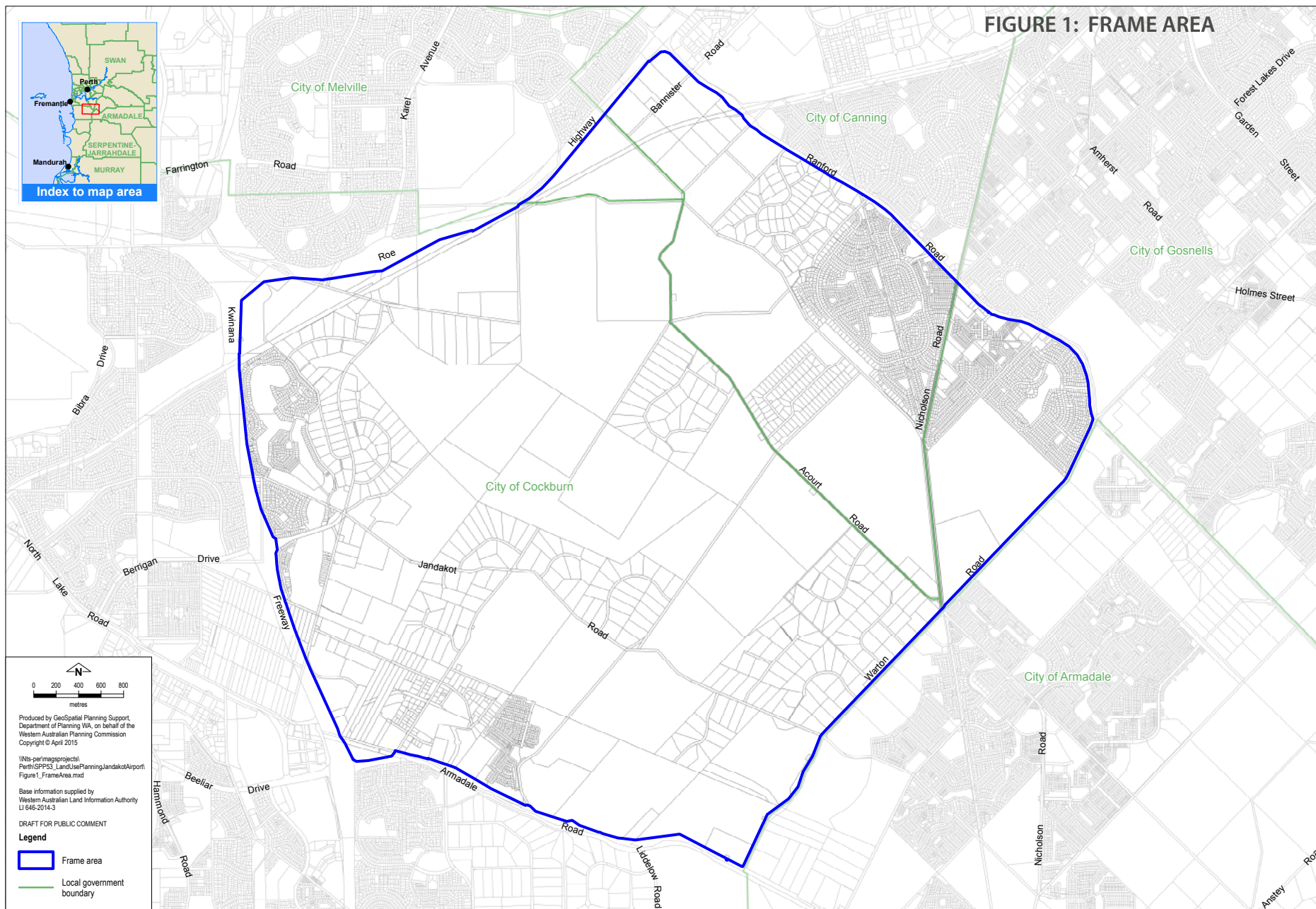
Certain activities in schools may be considered particularly noise sensitive and 50 dB(A) may be a more desirable indoor sound level to select for any teaching areas used for such activities. However, the effect of other noise sources should be considered.
- The provisions of this standard relating to different internal design sound levels for different indoor spaces could result in the use of different construction and materials in contiguous spaces, and require the construction of substantial barriers between habitable spaces, e.g. heavy self-closing internal doors, detracting from the amenity of the building. Therefore consideration should be given to a uniform perimeter insulation approach.



APPENDIX 3: NOTIFICATION ABOUT AIRCRAFT NOISE TO BE PLACED ON PROPERTY TITLE

Notification:

This property is situated in the vicinity of Jandakot Airport and is currently affected, or may be affected in the future by aircraft noise. Noise exposure levels are likely to increase in the future as a result of an increase in the aircraft using the airport, changes in aircraft type, or other operational changes. Further information about aircraft noise is available from the Jandakot Airport website. Information regarding development restrictions and noise insulation requirements for noise-affected property is available on request from the relevant local government offices.





GLOSSARY OF TERMS

ANEF

Australian Noise Exposure Forecast as endorsed by Airservices Australia and as amended from time to time. The ANEF is a cumulative measure of aircraft noise exposure that takes into account the following features of aircraft noise:

- the intensity, duration, tonal content and spectrum of audible frequencies of the noise from aircraft take offs, approaches to landing, and reverse thrust after landing;
- the forecast frequency of aircraft types and movements on the various flight paths; and
- the average daily distribution of aircraft arrivals and departures in both daytime and night time. (Daytime is defined as being between the hours of 7.00am and 7.00pm.)

ANEI

Australian Noise Exposure Index based on data for a previous year where the exact numbers and types of aircraft that used the airport are known.

AS 2021

Australian Standard 2021 Acoustics – Aircraft noise intrusion – Building siting and construction

Building site acceptability

Refers to the acceptability of sites for particular building types within various ANEF zones. Appendix 1 includes a classification of building site acceptability which has been adopted from AS2021. Building types are classified as 'Acceptable', 'Conditionally Acceptable' or 'Unacceptable', depending on the sensitivity of associated use or occupation of the building and the level of noise exposure forecast for the site.

Noise exposure zone

Refers to the areas within a specified range of noise exposure.

Noise sensitive premises

Premises occupied or designed for occupation or use for residential purposes (including dwellings, residential buildings or short-stay accommodation), caravan park, camping ground, educational establishment, child care premises, hospital, nursing home or place of worship.

OLS

Obstacle Limitation Surface.

PANS OPS

Procedures for Air Navigation Systems Operations.

REFERENCES

Commonwealth of Australia, 1996, *Airports (Protection of Airspace) Regulations 1996*

Airservices Australia, 1999, *The Australian Noise Exposure Forecast System and Associated Land Use Compatibility Advice for Areas in the Vicinity of Airports*

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