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By email: Maurizio@zmp.com.au

Our ref: 063601-02

Dear Maurizio

Re: Anambah Estate subdivision – Preliminary Assessment response – Aviation aspects

Please find in this correspondence a response to Item 8 (Aircraft Noise/ Flight Path Runway) of the Preliminary Assessment of the subject planning proposal, Maitland City Council (**Council**) reference RZ 20/001 dated 27 May 2020.

1.1. Project background

Anambah Estates Pty Ltd is preparing a subdivision proposal for 72 large residential lots in Anambah, New South Wales.

The subject land is located near Maitland Airport which is operated by Royal Newcastle Aero Club. Maitland Airport is a registered, code 2 and non-instrument approach runway aerodrome.

Aviation Projects prepared an OLS assessment of the subject land and found that, assuming residential houses are 8.5 m above natural ground level, the development will not impact on the obstacle limitation surfaces of Maitland Airport.

1.2. References

References used or consulted in the preparation of this report include:

- Maitland City Council, Maitland Development Control Plan 2011 (DCP);
- Maitland City Council, Maitland Local Environmental Plan 2011 (LEP); and
- other references as noted.

1.3. Obstacle limitation surfaces

In its preliminary assessment, Council agreed that buildings could be able to comply with the stated minimum height limitation recommended by Aviation Projects.

1.4. Flight paths

In relation to aircraft flight paths, Council states as follows:

> *"...it is not considered good planning practice to have dwellings within an aerodrome's take-off and landing flight path.*
>
> *Council has consistently maintained this standard around the aerodrome with regard to the northeast/southwest landing strip, the east/west landing strip and the grassed north south landing strip."*

The term 'take-off and landing flight path' or similar is not defined in the Maitland DCP 2011 or Maitland LEP 2011.

Civil Aviation Advisory Publication (CAAP) 166-1(v4.2) – Operations in the vicinity of non-controlled aerodromes – provides guidance with respect to Civil Aviation Regulation (CAR) 166. The purpose of this CAAP is to support Common Traffic Advisory Frequency (CTAF) procedures. It provides guidance on a code of conduct (good airmanship) to allow flexibility for pilots when flying at, or in the vicinity of, non-controlled aerodromes.

CAAP 166-1(v4.2) paragraph 2.1.4 states the following:

> *2.1.4 CASA strongly recommends the use of 'standard' traffic circuit and radio broadcast procedures by radio-equipped aircraft at all non-controlled aerodromes. These procedures are described in the Aeronautical Information Publication (AIP) and Visual Flight Rules Guide (VFRG), and discussed in Section 65 of this CAAP (Standard traffic circuit procedures) and Section 7 (Radio broadcasts).*

The standard circuit consists of a series of flight paths known as *legs* when departing, arriving or when conducting circuit practice. Illustrations of the standard aerodrome traffic circuit procedures are provided in Figure 1 and Figure 2.

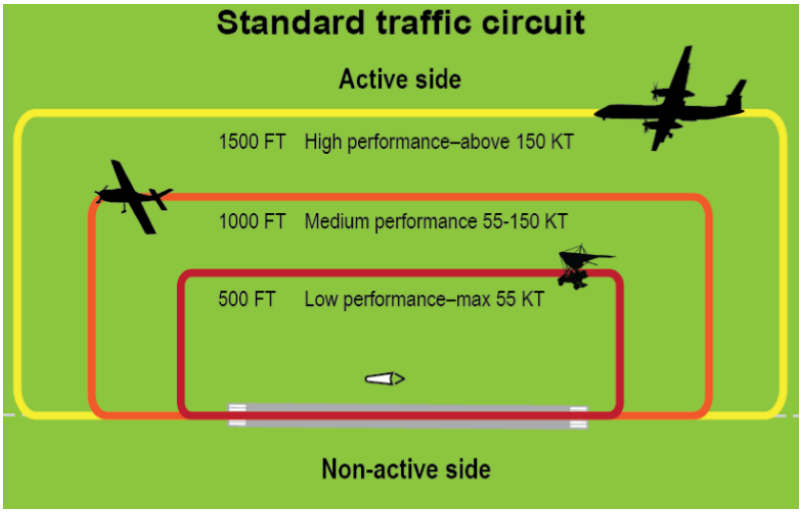

Figure 1 Lateral and vertical separation in the standard aerodrome traffic circuit

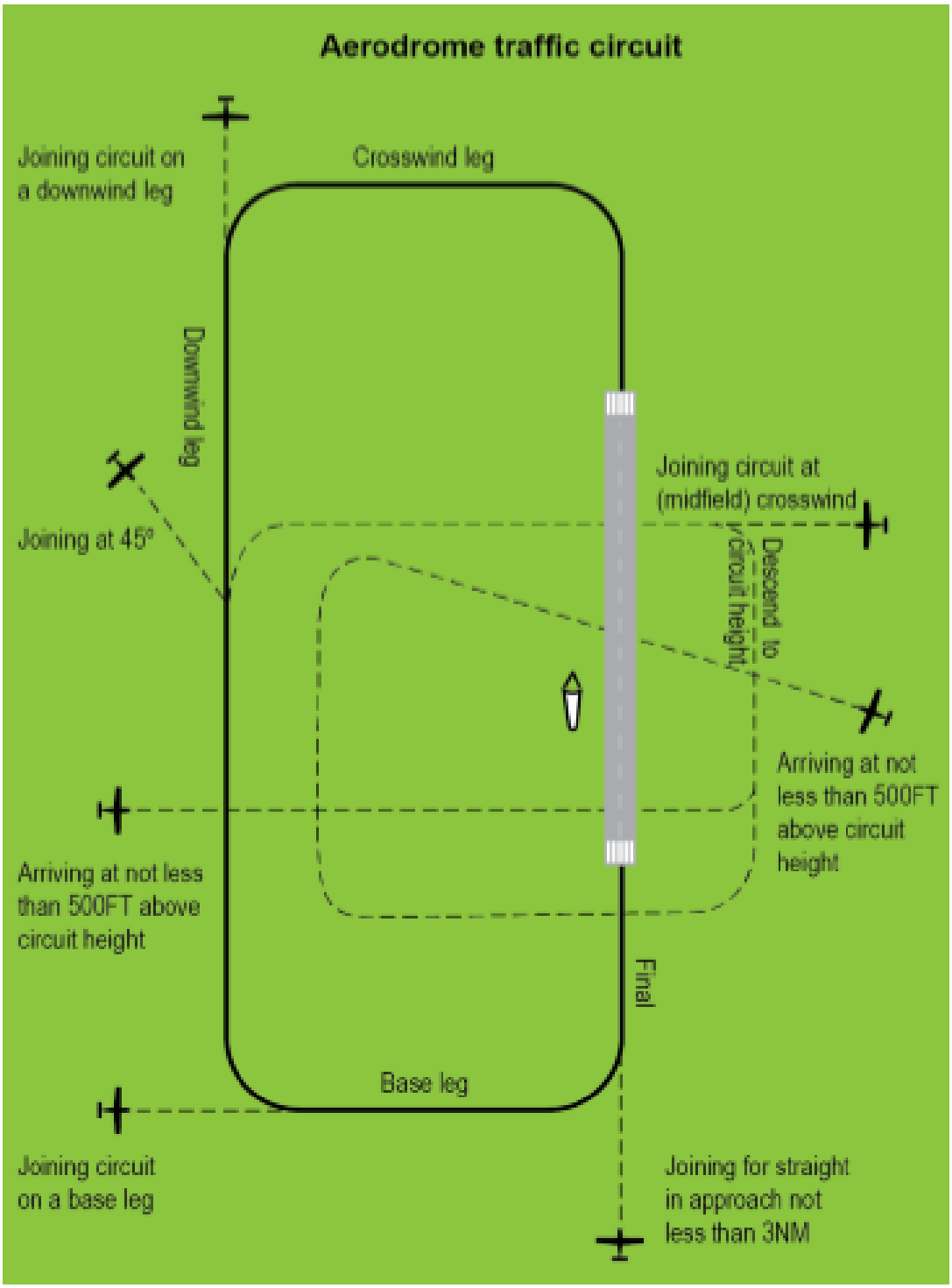

Figure 2 Aerodrome standard traffic circuit, showing arrival and joining procedures

Paragraph 5.3.1 provides guidance in relation to standard traffic circuit heights:

> *By convention, aircraft should fly the standard traffic circuit at the heights above aerodrome elevation listed in Table 1…*

Table 1 Standard circuit heights and aircraft performance

Type of aircraft	*Standard circuit speed*	*Standard circuit height*
High performance (includes jets and many turboprops)	*Above approximately 150 kt*	*1500 ft above aerodrome elevation*
Medium performance (includes most piston engine aircraft and gliders)	*Between approximately 55 kt and 150 kt*	*1000 ft above aerodrome elevation*
Low performance (trikes and ultralight aircraft)	*Approximately 55 kt maximum*	*500 ft above aerodrome elevation*

Paragraph 5.3.2 provides guidance in relation to the height required to be achieved during climb-out:

> *During initial climb-out, the turn on to crosswind should be appropriate to the performance of the aircraft but, in any case, not less than 500 ft above terrain so as to be at circuit height when turning downwind (refer paragraph 166A (2) (f) of CAR). Pilots may vary the size of the circuit depending on:*
>
> - *the performance of the aircraft.*
> - *AFM/Pilot's Operating Handbook requirements.*
> - *company SOPs.*
> - *other safety reasons.*

Paragraph 5.5.2 provides guidance in relation to the conduct of final approach:

> *Except for IFR circling operations, the turn onto final approach should be completed at least 500 ft above aerodrome elevation. This should allow sufficient time for the pilot to ensure that the runway is clear for landing. It will also allow sufficient time for the majority of aircraft to fly a stabilised approach and landing.*

Note: IFR is an acronym for instrument flight rules, under which aircraft are operated with reference to instruments/displays inside the cockpit.

CASA does not publish the dimensions of a standard circuit. It publishes guidance on what it calls 'standard traffic circuit procedures' in CAAP 166-01(v4.2).

The Federal Aviation Administration, in The Airplane Flying Handbook, Chapter 7 – Airport Traffic Patterns, suggests that that the "downwind leg is flown approximately ½ to 1 [statute] mile out from the landing runway". 1 statute mile = 0.87 nm.

The amount of runway required for take-off can be affected by such considerations as the runway surface (e.g. dry or wet, length of grass), actual temperature, wind direction and strength, the weight of the aircraft (which

can change for time to time according to the number of passengers or amount of baggage or other payload being carried), forward visibility and pilot handling.

The distance required to achieve the minimum 500 ft above ground level prior to turning onto crosswind can be affected by the aircraft's weight, engine performance, wind strength and direction and pilot handling.

The strength and direction of wind can affect aircraft tracking, which means that there is likely to be some variation in the tracks flown when performing a circuit. For this reason alone, any representation of a circuit pattern should be considered indicative only and subject to some variation according to environmental conditions and pilot handling.

In any case, for the purposes of the analysis herein, the following design parameters have been adopted for a nominal 1 nm circuit:

- 1 nm upwind to achieve at least 500 ft AGL;
- 1 nm abeam the runway for downwind spacing;
- 45° relative position from the threshold for the turn from downwind onto the base leg; and
- Roll out at 1 nm final, not below 500 ft AGL.

The image at Figure 3 depicts the representative 1 nm long upwind/final legs for each of the six runway ends at Maitland Airport (imagery: Google Earth, dated 01 October 2019). Note that the indicative lines are a simplistic representation and do not reflect the likely lateral and vertical variation in actual flight paths flown.

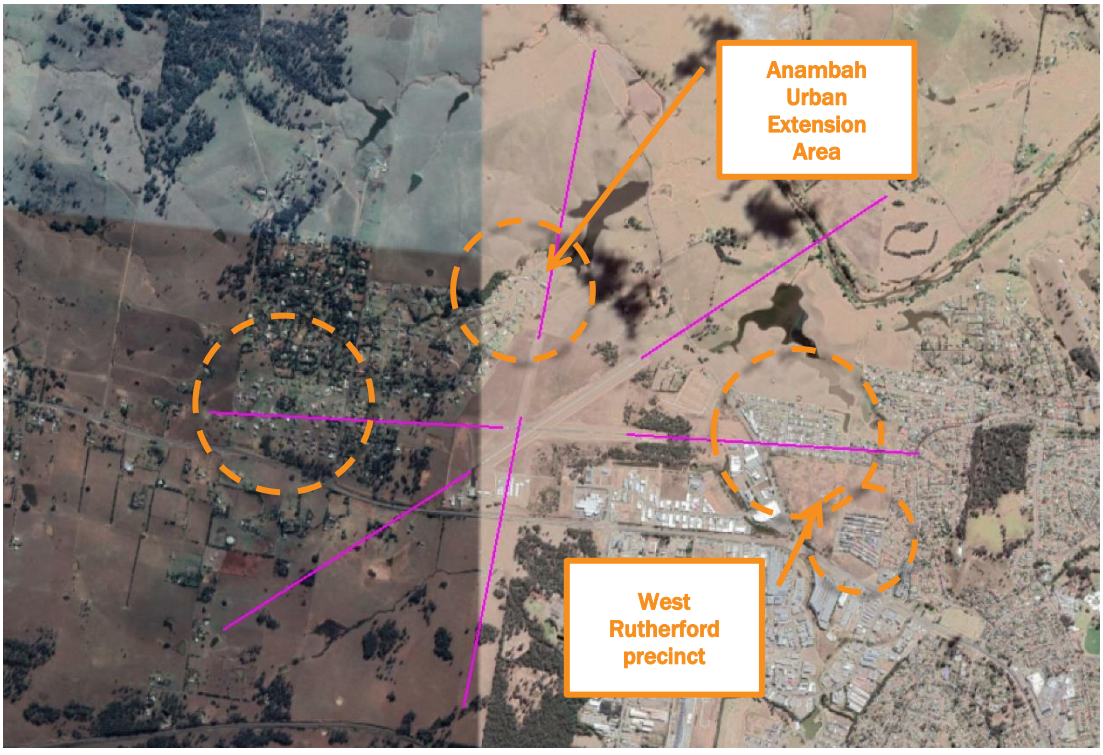

Figure 3 Upwind/final legs at Maitland Airport (01 October 2019)

The same indicative upwind/final legs are overlaid on imagery from Google Earth dated 12 July 2011 in Figure 4, in which it can be seen that dwellings shown in the most recent imagery – to the east and west of runway 08/26 and just to the west of the approach to runway 18 in the Anambah Urban Extension Area were not there in 2011 (circled in pumpkin colour). Also indicated in a smaller circle is the southern part of the West Rutherford precinct.

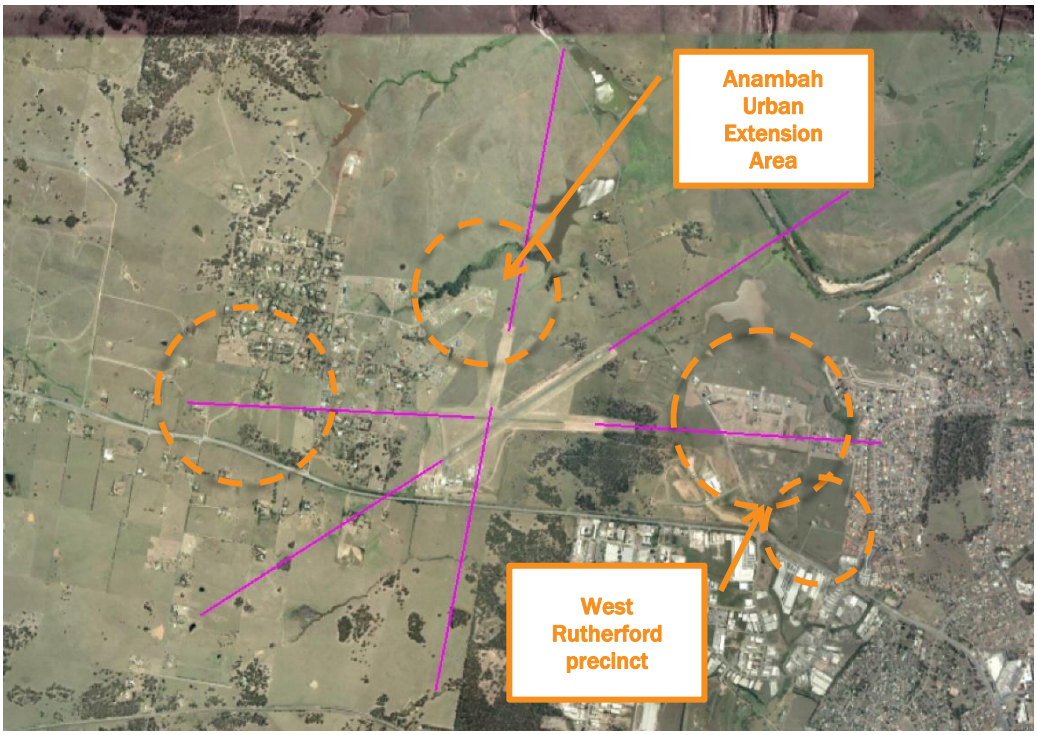

Figure 4 Upwind/final legs at Maitland Airport (12 July 2011)

The image at Figure 5 shows the obstacle limitation surfaces of Maitland Airport overlaid on satellite imagery (Source: Royal Newcastle Aero Club Obstacle Limitation Surfaces May 2013). It shows the approach surface for runway 26 overlies the West Rutherford precinct.

The West Rutherford Precinct Plan allows for further development within close proximity to the eastern upwind/approach leg for runway 08/26. The northern part of the southern development area is yet to be developed. Figure 6 refers.

The development of dwellings in these areas is inconsistent with the suggestion that it is not considered good planning practice to have dwellings within an aerodrome's take-off and landing flight path, or that Council has consistently maintained this standard around the aerodrome with regard to the northeast/southwest landing strip, the east/west landing strip and the grassed north south landing strip.

The proposed development of the Anambah Estate is not inconsistent with Council's planning practice in relation to the location of dwellings within an aerodrome's take-off and landing flight path, given the extent of recent residential development under the flight paths associated with the other two runways.

Figure 5 Maitland obstacle limitation surfaces

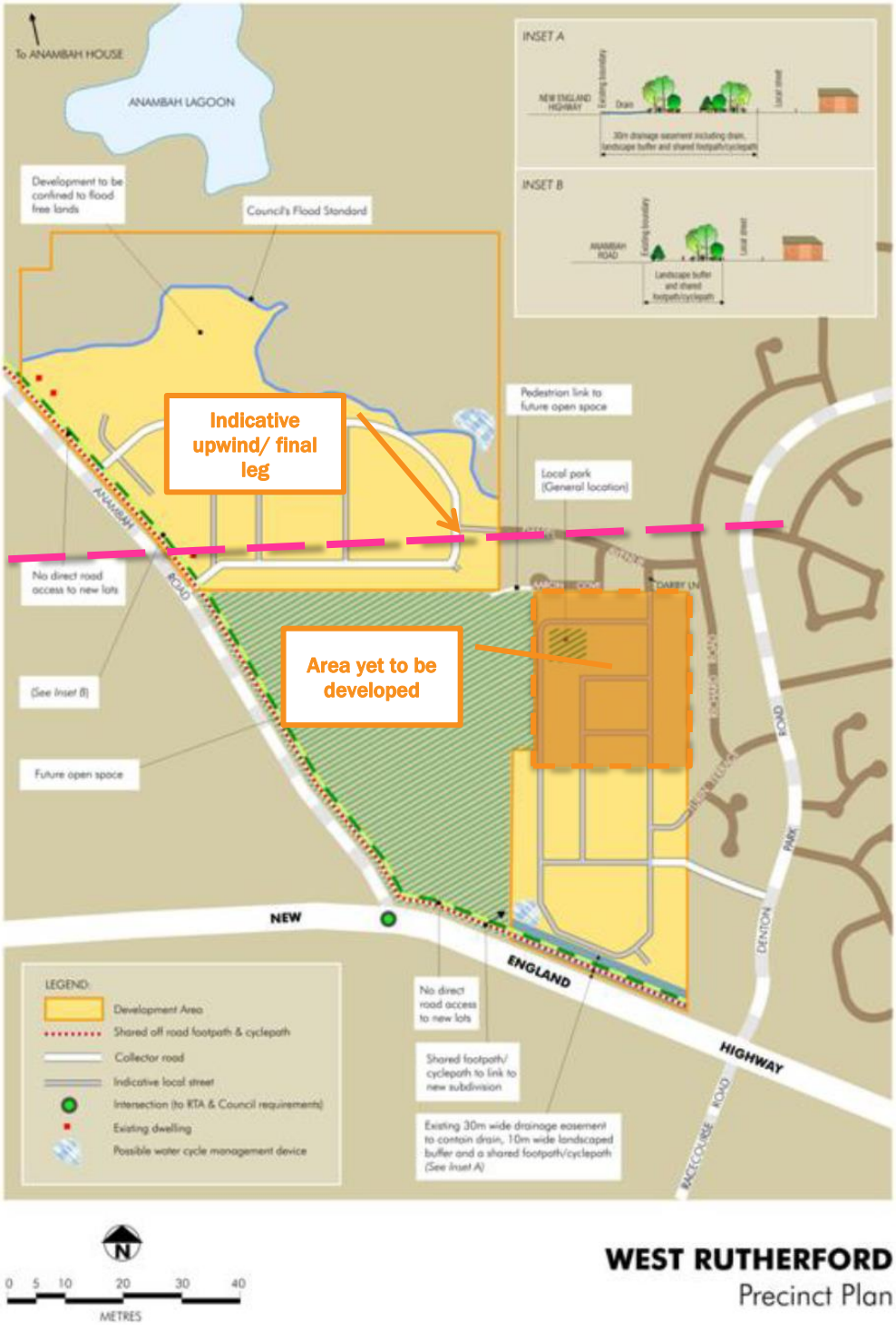

Figure 6 West Rutherford Precinct Plan

1.5. Aircraft noise

In relation to aircraft noise, Council noted the following issue:

> *It is of concern that the noise assessment did not include aircraft takeoff as this operation generates the most noise. An additional measurement will need to be undertaken to address this and provide recommendations for noise attenuation to meet relevant inside standards.*

Spectrum Acoustics prepared an assessment, in a letter dated 27 June 2017, of potential noise impacts on the proposed development. It overlaid a set of ANEC contours over the site and found that the majority of the current subject land is located outside of the ANEC 10 contours. A relatively small portion of the land is located inside the ANEC 10 to 15 zone.

Further, it noted:

> *assuming a correlation between the ANEF and the published ANEC for the Aerodrome, all of the land that is subject to the current proposal would be regarded as "Acceptable" for residential development (i.e. House, home unit, flat). The details also show that the land would be "Acceptable" to all other building types.*

The in-situ recording of actual aircraft noise over a three hour period is of interest but not directly relevant to the modelling of noise impacts (which results in the production of an ANEC/ANEF) based on a spectrum of likely aircraft types, prevailing wind direction, aerodrome modes of operation, variability of aircraft flight paths and time of day the flights occur.

The use of ANEF/ANEC contours to control noise impacts on various land uses is commonly accepted in land use planning.

A search of the Maitland DCP 2011 found reference to ANEC contours within Part F – Urban Release Areas, specifically in F.4 Anambah Employment Area which lies to the south and east of Maitland Airport.

In relation to item 1.6 Amelioration of Natural and Environmental Hazards, development controls 2 and 3 apply:

> *2. Proposed uses and building design must give consideration to exposure to aircraft noise for land within the hatched area on Figure 16.*
>
> *3. Buildings within this area are to be designed in accordance with the requirements of Australian Standard AS021 – Acoustics – Aircraft Noise Intrusion – Building Siting and Design.*

A copy of the referenced Figure 16 is provided at Figure 7.

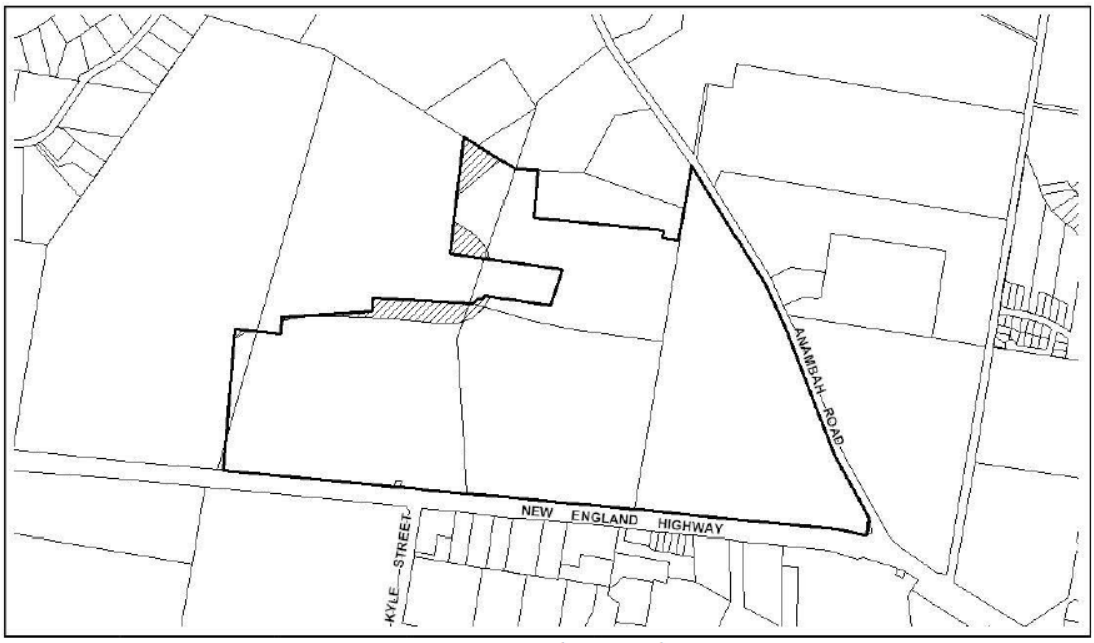

Figure 16: Land potentially affected by aircraft noise (ANEC-20).

Figure 7 Anambah Employment Area ANEC-20

In-situ measurement of the noise created by aircraft taking off from runway 08 may be of interest but not essential for the proper control of noise impacts over the proposed development, since it does not provide an holistic appreciation of the likely noise footprint of aircraft operations.

Spectrum Acoustics' application of ANEC contours for the control of potential aircraft noise impacts on the proposed development is consistent with commonly accepted planning practices and the use of this control in the Maitland DCP 2011.

If you wish to clarify or discuss the contents of this correspondence, please contact me on 0417 631 681.

Kind regards

Keith Tonkin

Managing Director

06 July 2020