Attachment 6.1.4

Whisperwind

22 January 2021

David Taylor
Chief Executive Officer
Shire of Nannup
Adam Street
Nannup WA 6275

Dear Mr Taylor

Development Application – 40 Rivergum Way, Darradup – Bitumen Driveway/Private Airstrip
Your Ref: AS 770

Thank you for your letter dated 15 January 2021 which requested further information and included the responses received from the neighbours.

Herewith please find our response under reply to the items outlined in the aforementioned letter.

We trust that the information furnished will meet your expectations and we look forward to receiving a favourable outcome.

Yours sincerely,

Dieter Ebeling
Evernow Pty Ltd ACN 120978761
ATF Whisperwind ABN 20694477418

Whisperwind

Development Application - 40 Rivergum Way, Darradup

Bitumen Driveway/Private Airstrip Development

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Whisperwind

Applicant Response to the Shire of Nannup

The points in the letter from The Shire of Nannup dated 15 January 2021 refer.

Please note that we have engaged an independent, third party aviation consultant, namely Robert Potter of Aircraft Performance Systems Pty Ltd (APS) to provide a report addressing various items pertinent to the aforementioned Shire of Nannup letter. The points which have reference to this report are noted under each item below.

Shire of Nannup Items

1. **Light Aircraft Classification with Maximum Take Off Weight (MTOW) below 5,700kg**
   The aircraft that we fly are a Beechcraft Baron 58 which is a six seater aircraft and an Evektor Harmony Light Sport Aircraft which is a two seater aircraft. Larger aircraft such as the Embraer 120 and the Beechcraft 1900D will not be flown onto the property and were never intended to be as they are over 5,700kg MTOW. The airstrip is unsuitable for the latter two aircraft types and they are unable to operate there. Other aircraft that we would fly in would be an Extra NG aircraft which has multiple uses (as per the APS report at Annexure A) as a commuter and tourer, and perhaps other Light Sport Aircraft with a MTOW of 600kg similar to the Evektor Harmony. Occasionally a Cessna 182 or similar may visit. The applicant will not operate aerobatics over the property and this was never the intention.

   Please refer to:
   - **Annexure A – APS:**
     Aircraft Classifications
     Note: MTOW and Noise Certification for the three aircraft types are provided under Annexure A.

2. **Local Flying**
   Local Flying entails visiting friends in the Southwest region or flying to another town, and not recreational flying around the Town of Nannup, above the property nor over the neighbours' houses. We will not be buzzing around the local area as it is not neighbourly.

3. **Night Operations**
   We have noted a neighbour's request and we concede to no night take-offs and landings at the airstrip.

4. **Noise impacts on amenity**

   Please refer to:
   - **Annexure A – APS:**
     Aircraft Noise Requirements and Impacts and Aircraft Noise and Environment Amenity

5. **Number of Movements**

   We wish to apologise for any consternation caused by the number of 365 previously mentioned. The intent was never for excessive flying to occur and after further review of our requirements the number of annual movements required will not be in excess of 120 take-offs and landings, therefore perhaps averaging 10 per month. Movements will vary on average, depending on the number of visits, however the annual total of 120 won't be exceeded. Multiple movements won't occur on a day, a few at best occasionally, and then within the bounds of the 120 take-offs and landings per year. The applicant assures that there will be no commercial flight activity and that the flying is private and not extensive in nature.

6. **Location of the Airstrip**

   Further to the request to relocate the airstrip, we herewith submit an alternative placement for the airstrip, being Option 2, which will place it in the centre of the property, still maintaining the same North – South aspect. Due to the typography, this Option 2 will entail a reduction in airstrip length of 100m resulting in a total length of 900m.

7. **Airstrip Construction**

   Please refer to:

   - **Annexure B – Bridgetown Surveyors Engineering Design:**
     Specifications of Airstrips Option 1 and Option 2

8. **Habitat quality and native fauna**

   We wish to note that the Department of Biodiversity, Conservation and Attractions (DBCA) has an existing airstrip (ALA) in the same region, approximately 18km away, namely Nannup Airstrip YNAU. It is therefore likely that aspects of the quality of habitat and native fauna impact in the area was taken into account with the construction of that airstrip and therefore the same dispensations, if any, should apply to the proposed private airstrip. We also wish to note that there is an existing Clearing Permit 8205/1 - File Number DWERVT1491 authorising the clearing of 60 Eucalyptus Marginata trees on the property, of which only 12 out of the 60 trees have been cleared thus far.

   Please refer to:

   - **Annexure A – APS:**
     Aircraft Noise Impacts on Habitat and Native Fauna
   - **Government of Western Australia Clearing Permit Number 8205/1**
     File Number DWERVT1491

9. **Responding to neighbours concerns**

   Please see neighbours items on the page below.

Neighbours Items

A number of the neighbour concerns have been addressed in the Shire of Nannup items above.
The below addresses those concerns not already covered.

1. **Wedge-tailed Eagle, Red-tailed Black Cockatoos, Carnaby's Black Cockatoos, Baudin's, and other fauna and flora:**
   We understand that some neighbours are concerned about the clearing of trees required for the construction of the airstrip and the impact that it may have on the population of the Wedge-tailed Eagle, Red-tailed Black Cockatoos, Carnaby's Black Cockatoos, Baudin's and other fauna and flora on the property. In order to mitigate any tree clearing required for the construction of the private airstrip, we submit that we will register a 2 hectare portion of land bearing existing trees to be set aside for the protection and management of vegetation as an irrevocable Conservation Covenant to be issued in perpetuity according to the Soil and Land Conservation Act 1945. This will be documented on the Certificate of Title recognising the value of sound land management practices and the value of protecting areas within the land in order to promote land conservation. We thereby will establish a permanent sanctuary protected by Covenant that will provide 2 hectares of conservancy in perpetuity.

   Please refer to:
   - **Annexure C – Proposed Conversation Covenant placement**
     Please refer to the below extract from the Soil and Land Conservation Act 1945, Part IVA — Conservation covenants and agreements to reserve, Clause 30B (2) :(b)

30B. Registration and form of covenant or agreement

(1) Where, in accordance with this section, the owner of any land covenants with the Commissioner by instrument in writing to set that land aside for the protection and management of vegetation, the Commissioner may deliver a memorial of the instrument, in a form approved by the relevant land registration officer, to the relevant land registration officer who shall thereupon register the memorial and accordingly endorse or note the appropriate register or record in respect of the land to which the instrument relates.

(2) An instrument under subsection (1) —

(a) may be expressed to have effect for a period of time specified in the covenant or in perpetuity;

(b) may be expressed to be irrevocable, in which case it shall be known as a ***conservation covenant***, and if it is not expressed to be irrevocable shall be known as an ***agreement to reserve***.

2. **Construction material:**
   As construction materials will be mostly sourced on the property other than the materials required for the bitumen surface, there won't be 600 truck movements required for this project and the disturbance on the public roads should not be out of the ordinary.

3. **Drainage:**

   Please refer to:
   - **Annexure B – Bridgetown Surveyors Engineering Design:**
     Specifications of Airstrips Option 1 and Option 2

4. **Commercial use concerns:**
   The application is in the name of a family trust. We are 2 parents with 3 children aged in their 20's, so a family of 5 in total. There is no business objective here, to the contrary, it is a family retreat. It will be both a family home from home and there will be some farming endeavours.

5. **Aircraft use:**
   Our aircraft has a maximum seating capacity of 6 in total and the other aircraft is a two seater. There will be no "big" planes, no 20 seater planes, no commercial jets, no commercial aircraft demo flights, no commercial joy flights and no corporate events. This is solely a private family residence.

6. **Property use:**
   As a private family residence, the property is not intended to be made available for any short stay accommodation nor as an AirBnB.

7. **Noise:**
   Our aircraft have noise certificates via official certification by ICAO, meeting the Australian Air Navigation (Aircraft Noise) Regulation. A take-off occurs within a minute or two where after the noise dissipates and is gone.

   Please refer to Annexure A:
   - **Annexure A – APS:**
     Aircraft Noise Requirements and Impacts

8. **Fuel:**
   A small fuel trailer may be kept on site which will be sufficient to top up fuel if required and we therefore won't necessarily store more fuel than a typical farm would to refuel farming equipment for its own energy purposes.

9. **Bitumen:**
   The bitumen runway will be constructed with grass surrounding it. This will attend to runoff and drainage as depicted in the surveyor's detail. Note that a bitumen surface results in a quicker take-off and landing footprint and it mitigates dust and soil erosion.

10. **Aircraft emissions:**
    Aircraft emissions of these types of aircraft are minimal and well accepted under the aircrafts' respective type certification issued by CASA – these are not large passenger transport jets.

    Please refer to:
    - **Annexure A – APS:**
      Aircraft Emission Requirements and Impacts

11. **Flight paths:**
    There are no proposed approach and departure flight paths over any dwellings as the flight approach path is North – South over the forest for landing and take-off. This is a primary reason for the orientation of the private airstrip.

Whisperwind

Annexure A

Independent Report

Aviation Performance Systems Pty Ltd

Our Company Story

Operating since 1996 Aviation Performance Systems provides aircraft performance analysis, operational support, ground training and consultancy services to a wide range of aircraft and aerodrome operators.

Although our specialty is direct operational support in the form of takeoff and landing performance analysis, including the design of contingency procedures for engine out operation, we also undertake aircraft capability analysis for pre-purchase business case development, route and city pair analysis and validation, advice on runway extension and expansion planning, design of route minimum safe altitude procedures, aircrew ground training and regulatory advice and liaison.

Our client base is diverse in both size and nature, with runway expansion planning advice for Roma and Merimbula Airports, operational support and aircraft performance analysis for a significant number of corporate, FIFO, freight and scheduled passenger operations including Sydney Jet Charter, Execujet, Corporate Air, Transjet, Raytheon Australia, Hazelton Airlines (now part of Regional Express), Toll Aviation, Macair Airlines, Brindabella Airlines, Air Link, Air South, Aeropelican, Pelican Airlines and Hardy Aviation, instrument procedure designing to both GNSS and conventional NAVAID standards for AirServices Australia and aircraft capability and route analysis for proposed FIFO and tourist development operations through subcontracts to QLD Airport Consultants, Airport Survey Consultants and Aerodrome Management Services.

Like our client base the range of aircraft types for which we have provided services varies widely in size, performance capability and regulatory requirements. Ranging from small turbine and piston transport fleets including Beech 200, and Cessna 404, corporate jet operations including Lear 35/45/60 and Cessna Citation 500/525/550/560, to heavy transport and commuter turbine fleets including B747-400, B737-400/800, EMB 120/145/170, F27-600, ATR42-300/500, DHC-8-315, SAAB340A/B, Jetstream 32/41, Beech 1900C/D, Beech 350 and Metro 3/23.

Aviation Performance Systems draws on a wide range of professional experience and use of current technology to provide our clients with reliable, accurate and timely support and advice. From aircraft performance analysis to regulatory advice, from fleet planning to air operator certification implementation, we offer specialist support whether planned or at short notice. Our documentation draws praise from management and aircrew alike for clear presentation, ease of use and its capacity to draw together a wide range of complex information and present it clearly in one place.

Our Company Principal

The company principal, Robert Potter, holds a Master of Scientific Studies (Aviation) from the University of Newcastle, is a qualified ICAO PANS-OPS instrument procedure designer and has completed additional professional qualifications including aircraft performance engineering with Boeing Commercial Airplanes. In addition he holds a first class airline transport pilot's licence (Australia) with eight thousand hours of flying experience ranging from a SAAB 340B command in airline operations to corporate jet flying to Tiger Moth and aerobatic experience. His ground training background includes lecturing in aircraft operation and performance at the University of Newcastle and conducting much sort after professional training for aircrew in type specific aircraft performance courses. A collaborative approach with clients is at the heart of his striving to promote a greater understanding of aircraft performance and to improve safety and commercial outcomes for all types of aircraft operation with which he is involved.

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Mr Dieter Ebeling

Evernow Pty Ltd as trustee for
Whisperwind ABN 20694477418
C/- Unit 16, 100 Railway Road
SUBIACO WA 6008

20 January 2021

Dear Mr Ebeling,

Thank you for your recent call and correspondence regarding your proposed private airstrip development and the clarifications sought by the local council.

Below please find the results of my research into the several aspects that you have identified as requiring specific technical input.

Aircraft Classifications

Regarding Item 1 of the correspondence from Mr. Taylor, CEO of the Shire of Nannup, I concur with his conclusion that there appears to be confusion regarding the classification of the aircraft that you propose to operate and also the limitations imposed by the nature of the Aeroplane Landing Area (ALA) that you wish to construct.

As you will be aware, regulatory authorities worldwide have for many years treated aircraft as either large aircraft or small aircraft with numerous pilot licensing, operating, and airworthiness (certification) requirements utilising this distinction.

In 1953 the U.S. Federal Aviation Regulations (FAR) adopted 12,500 pounds maximum certificated take-off weight (MCTOW) as the distinction between large and small aircraft. This was based in part upon certain aircraft and power plant design considerations which were considered relevant at the time. The International Civil Aviation Organisation (ICAO) and the European Joint Aviation Requirements (JAR)[1] later determined to use 5700 kg as the distinction between large and small aircraft.

Australia used the U.S. FAR 12,500 lb weight distinction for many years, but subsequently adopted the ICAO 5,700 kg figure for the applicable airworthiness, operational and pilot licensing requirements, with aircraft **not above** 5,700 kg MCTOW being deemed **small** aircraft and aircraft **above** 5,700 kg MCTOW being deemed **large** aircraft.

While this primary weight based distinction remains, in more recent times there have been additional weight sub-groups developed for very light fixed wing aircraft, gliders, weight-shift micro-light aircraft, gyroplanes, powered parachutes and balloons. In Australia these are generally referred to as Light Sport Aircraft (LSA), however different terminologies are used in overseas jurisdictions. Additionally, the number of passenger seats fitted, aircraft dimensional characteristics and aircraft performance capabilities have also become determinant elements for the regulation of licensing, airworthiness and aircraft operation.

[1] Subsequently, and currently, the European Union Aviation Safety Agency (EASA).

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The aircraft types referred to by Mr Taylor, namely the Embraer 120 and Beechcraft/Raytheon 1900D are examples of aircraft deemed to be **large aircraft** as they both have MCTOW weights above 5,700 kg, with the Embraer 120 being a Transport Category[2] aircraft and the Beechcraft/Raytheon 1900D being a Commuter Category aircraft. Based on the preliminary information that you have supplied to me, the Aeroplane Landing Area (ALA) that you have proposed would not be a suitable aerodrome under Civil Aviation Regulation 92(1)(d) for the operation of these aircraft or any similar type.

The aircraft types that you have identified as being those intended for operations at the proposed ALA are all **small aircraft**, or sometimes referred to as 'light' aircraft, with all types having MCTOW values not above 5,700 kg.

Below please find a summary of the aircraft identified and their airworthiness certification basis:

Commercial Designation	Model	MCTOW	Certification Categories
Raytheon / Beechcraft Baron 58	58	2,495 kg (5,500 lb)	Normal Category.
Evektor Harmony LSA	EV-97 VLA	600 kg	Light Sport Aircraft (AUS); Very Light Aeroplane (EASA).
Extra NG	EXTRA NG	950 kg	Normal Category; Aerobatic Category.

Note: The Type Certificate Data Sheet (TCDS) for the Evektor Harmony currently available on the EASA website does not reflect a manufacturer upgrade of the MTOW from 575 kg to 600 kg. The 600 kg MTOW has been accepted by the Civil Aviation Safety Authority (CASA) and applied to this aircraft serial via the published aircraft flight manual.

A point to note regarding the certification categories for small aircraft, other than Light Sport Aircraft, is that they may be certified in more than one category and have a standard Certificate of Airworthiness issued in these multiple categories. The general categories to which I refer are Normal; Utility and Aerobatic categories. In order to operate in each category limitations regarding occupant numbers, aircraft weight, centre of gravity location and aircraft manoeuvres will be stated in the aircraft flight manual and on placards in the aeroplane.

I draw attention to this point as you have alluded to there being expressions of concern among neighbours regarding the operation of aircraft that may be capable of aerobatic operation by way of having certification in the aerobatic category. The aircraft that you have identified are not competition based aerobatic aircraft, despite one of the aircraft types, namely the Extra NG, having an aerobatic category certification. There are a number of small and commonly recognised aircraft, the Cessna 152 training aircraft being a case in point, that also have the same certification and such certification provides for the conduct of manoeuvres that are beyond those for which a Normal Category aircraft is designed or permitted to conduct. Simply having the design capability or having the airworthiness authorisation to engage in aerobatic manoeuvres does not absolve an aircraft from being required to meet all of the additional regulatory standards such as noise standards and be operated in accordance with the operational requirements such as restrictions on

[2] The Certification Category determines the design and airworthiness standards applicable to the aircraft type.

operations in the vicinity of aerodromes or over populated areas. It may not be clear to those unfamiliar with the regulatory requirements that merely having access to a capability does not mean that it is possible to utilise such capabilities at all times nor that standards designed to enhance environmental amenity are not applied at all times during the operation of the aircraft.

Aircraft Noise Requirements and Impacts

Australian Legislative Requirements

The regulation of aircraft noise in Australia is provided by the *Air Navigation (Aircraft Noise) Regulations 2018*, which are made under the Air Navigation Act 1920. Section 6(3) of these regulations require that aircraft of the type addressed by this discussion, i.e. aircraft that are neither subsonic **jet** aircraft or supersonic aircraft, must have a valid noise certificate in force before being able to conduct 'air navigation' in Australia.

Unless some form of exemption against the required noise standards is granted to a specific aircraft, the issuance of a noise certificate will only be made if it can be demonstrated that the aircraft complies with the required noise standards, the provision of which are detailed in Schedule 1 of the regulations.

In the case of small, propeller driven aeroplanes the applicable provision of standards are detailed at Item 7 and Item 8 of the Schedule, which provides for use of Chapters 6 and 10 of Volume 1 of ICAO Annex 16.

In the cases where the application for an aircraft type certificate was made and granted by an issuing authority that did not make specific use of the ICAO Annex 16 standards, the Australian regulations also provide for the use of standards that are deemed equivalent to the applicable ICAO Annex 16 standards. Standards such as Part 36 of the US Federal Aviation Regulations (FAR), which is the reference used for the Baron 58 Noise Certificate, illustrates such a situation.

Aircraft Noise Standards

As previously detailed, the aircraft noise standards applicable to small propeller driven aeroplanes are prescribed by Schedule 1 of the Australian *Air Navigation (Aircraft Noise) Regulations 2018* which in turn references the standards produced by the International Civil Aviation Organisation (ICAO) and published in Volume 1 of Annex 16 to the Chicago Convention. The Annex 16 standards are published in various chapters according to the type of aircraft or powered aircraft system, the form of the aircraft's propulsion, the maximum takeoff weight and the date on which the application for a type certificate was submitted. The addition of new chapters trends progressively toward tightening noise restrictions on aircraft as new applications for type certificates are submitted, with an emphasis on the noise requirements for large aircraft.

In the case of small, propeller driven aeroplanes, the division related to type certificate application date is 17-NOV-1988. Applications submitted before 17-NOV-1988 are regulated by Chapter 6, while applications submitted on or after 17-NOV-1988 are regulated by Chapter 10.

The changes prescribed by the later published Chapter 10 requirements centred primarily about the method used to measure the noise output of aircraft. The Chapter 6 standard was based around measuring the noise level received on the ground produced by an aircraft overflying the acoustical equipment at a height of 300 metres, generally referred to as the overfly method, whereas the Chapter 10 standard was based around measuring the noise level received on the ground produced by an aircraft overflying the acoustical equipment at a height that the aircraft naturally gains after commencing a maximum power takeoff from a distance of 2,500 metres from the acoustical equipment, generally referred to as the takeoff method.

The technical detail related to the sound measurement procedures, the equipment requirements and the necessary corrections applicable to standardise the test results is too extensive for this discussion, however the prescribed maximum noise levels for the chapters relevant to this discussion are summarised below:

Maximum Noise Levels: ICAO Annex 16: Volume 1; Chapter 6; para 6.3			
MCTOW (kg)	0 to 600	600 to 1,500	At or above 1,500
Noise Level in dB(A)	68	MCTOW derived linear interpolation between 68 and 80 60 + 13.33 [M/1000]	80

Note: The formula shown may be used to derive the interpolation value. M = The MCTOW in kg

Maximum Noise Levels: ICAO Annex 16: Volume 1; Chapter 10; para 10.4(a)			
MCTOW (kg)	0 to 600	600 to 1,400	At or above 1,400
Noise Level in dB(A)	76	MCTOW derived logarithmic interpolation between 76 and 88 83.23 + 32.67 log [M/1000]	88

Note: The formula shown may be used to derive the interpolation value. M = The MCTOW in kg

Maximum Noise Levels: ICAO Annex 16: Volume 1; Chapter 10; para 10.4(b)			
MCTOW (kg)	0 to 570	570 to 1,500	At or above 1,500
Noise Level in dB(A)	70	MCTOW derived logarithmic interpolation between 70 and 85 78.71 + 35.70 log [M/1000]	85

Note: The formula shown may be used to derive the interpolation value. M = The MCTOW in kg

As mentioned previously and relevant to this discussion, the Australian regulations permit the use of equivalent standards for the issuing of aircraft noise certificates and in the case of one of the aircraft that you operate the relevant US FAR Part 36 standard is equivalent to the ICAO Annex 16; Volume 1; Chapter 6 standards. The prescribed maximum noise levels for this US standard are summarised below:

Maximum Noise Levels: US 14 CFR Part 36; Appendix F			
MCTOW (lb)	0 to 1,320	1,320 to 3,300	At or above 3,300
Noise Level in dB(A)	68	MCTOW derived linear interpolation between 68 and 80 68 + {(M – 1320) / 165}	80

Note: The formula shown may be used to derive the interpolation value. M = The MCTOW in lb

Noise Levels and Standards Applicable to Selected Aircraft

In the case of the aircraft already identified as those that you intend to operate, the following is a summary of the certified noise levels and the noise standards that are applicable to each aircraft type:

Commercial Designation	MCTOW	Applicable Noise Standard & Limit	Certified Noise Level – dB(A)
Raytheon / Beechcraft Baron 58	5,500 lb (2,495 kg)	US 14 CFR Part 36; Appendix F: (80 dB(A))	78.8
Evector Harmony LSA	600 kg	ICAO Annex 16: Volume 1; Chapter 10; para 10.4(a) (76 dB(A))	70.7
Extra NG	950 kg	ICAO Annex 16: Volume 1; Chapter 10; para 10.4(b) (77.9 dB(A))	77.1

By inspection of the relevant international aircraft noise databases it can be seen that the noise levels emitted by the selected aircraft are typical for aircraft of these types and categories. The databases are too extensive to present here, however they may be accessed as follows:

The EASA database may be found at <https://www.easa.europa.eu/domains/environment/easa-certification-noise-levels>: Select the download 'xlsm' file listed as "*Light propeller driven aeroplanes noise database*"; and …

The US Federal Aviation Administration (FAA) database may be found at <https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22942> : Select the download 'pdf' file listed as "*AC 36-1H Including Change 1*" and inspect Appendix 7 and Appendix 8 for the relevant listings.

Aircraft Noise and Environmental Amenity

The concept of amenity can be very subjective due to the variations in human hearing acuity and psychological perceptions of sound, particularly in terms of reactions to peak pressure levels, frequency and harmonic tones. The negative effects of excessive and sustained noise levels to human hearing and psychological wellbeing is well documented and it is the results of this research that has been driving the general move to protect the community from excessive and-or sustained noise.

To quote in part the introduction of the ICAO website related to this topic[3]:

"*The primary purpose of noise certification is to ensure that the latest available noise reduction technology is incorporated into aircraft design and that this is demonstrated by procedures that are relevant to day-to-day operations*."

Regarding the categories of aircraft relevant to this discussion the ICAO website related to this topic states:

"*Noise Standards for light propeller aeroplanes were first included in Annex 16 in 1974. Currently, these Standards are contained in Annex 16 Vol I Chapter 10, which are restricted to propeller-driven aeroplanes not exceeding 8,618 kg maximum certificated take-off mass. This Standard is based on a single take-off reference noise measurement point, which is located at a distance of 2,500 m from the start of take-off roll. As is the case for larger aeroplanes, the Standards also set noise limits as a direct function of Maximum Take-off Mass (MTOM)*".

To add a proper context to the sound levels emitted by aircraft adhering to the mandated aircraft noise standards in Australia and internationally, I feel it would be best to relate the noise levels to everyday machines familiar to the community at large. To quote the introduction to a current educational publication produced by the WA Department of Mines, Industry Regulation and Safety[4]:

"*Rotary mowers range in noise levels from 84 dB(A) to 94 dB(A) depending on engine type (4-stroke or 2-stroke) and condition and operating speed*."

Another source of information listing the noise emitted by common outdoor machinery and equipment comes from the hearing conservation program of the University of Florida[5]. An extract of this information provides the following data:

University of Florida: List of Noise Levels for Common Equipment *(extract)*	
Noise Source	**Sound Level - dB(A)**
Riding Lawn Mower	90
Tractor	92
Front End Loader	95
Blower	99

[3] <https://www.icao.int/environmental-protection/pages/reduction-of-noise-at-source.aspx>

[4] <https://www.commerce.wa.gov.au/publications/noise-management-lawn-mowers>

[5] <https://webfiles.ehs.ufl.edu/noiselvl.pdf>

The implication, albeit on a simplified basis, is that the measured noise level of the Baron 58 at 78.8 dB(A), the highest level of the selected aircraft, when measured at 300 metres from the source, as prescribed by the Annex 16, Chapter 6 'fly-over' standard, would be lower than that generated by an average rotary lawn mower or ride-on mower located near to the sound receiver (such as in the yard of a dwelling). The measurement standard used to rate the noise emitted by rotary lawn mowers is not available to me, however I am aware that the rating measurement is taken quite close to the machine in order that an assessment can be made of the OH&S impact of mower use and to determine the need for hearing protection when making use of these machines for any reasonable length of time.

It is worth noting at this point that a later model of the Baron 58, namely the G58, utilises the same engine and propeller combination, however this model has been subject to noise measurement under the Annex 16, Chapter 10-(10.4a) 'takeoff' standard for the issue of its EASA type certificate. The measured noise level in this testing was 82.2 dB(A) and this would be measured at an overfly height of approximately 136 metres under the prescribed measurement conditions. Even at this reduced distance the measured noise level would be lower than that generated by an average rotary lawn mower or ride-on mower as detailed previously.

The over-flight measurement concept, both the takeoff flyover and the earlier fixed height flyover, has been used in part because the peak sound pressure wave projection of propeller driven aircraft is primarily along the longitudinal axis of the aircraft. Additionally the desire was to measure the noise in a free air environment where the sound measurements could be reasonably expected to reflect the noise generated by the aircraft alone without interference by attenuating sources such as ground surface materials or other atmospheric effects close to the ground or intensifying sources such as ground surface and object reflections.

Since all of the properties adjacent to the proposed ALA are laterally displaced from the runway, with none being in either the takeoff or landing approach flyover areas, the projection of pressure waves from the aircraft during takeoff ground roll, takeoff climb and landing approach becomes more complex to assess. I note that while the Option 1 proposal placed the closest dwelling to the runway at a lateral distance of 97 metres, the Option 2 proposal placed the same building at a lateral distance of approximately 225 metres. I would estimate that the likely free air noise level emitted by the Baron 58 would be approximately 80.4 dB(A) at that distance, which is still consistent with the rotary mower and ride-on mower comparison made previously.

When operating on the ground the predominance of noise generated will be by the engine exhaust, which is subject to standard muffler or silencer fitment similar to motor vehicles and the noise level will be well below that generated at the higher power settings used to measure the aircraft noise output for certification purposes. The predominance of noise generated at high power settings immediately prior to the commencement of takeoff comes from the shock waves and harmonics produced by the propellers, particularly the propeller tips, and it is these pressure waves that tend to be released in front of and behind the aircraft with lateral release at much lower levels. During the application of takeoff power, the subsequent ground run and finally the after takeoff climb of the aircraft these pressure waves will be the subject of variation due to some or all of the following elements:

- Ambient atmospheric conditions;
- Attenuation by any trees and understory vegetation between the aircraft and the sound receiver;
- Doppler effect as the aircraft accelerates toward, passes and then recedes from the sound receiver;
- Variation in distance from the sound receiver as the takeoff sequence progresses;

- Variation in the angular displacement between the longitudinal axis of the aircraft and the sound receiver as the takeoff sequence progresses (i.e. the angular aspect of the aircraft that is facing the sound receiver).

It is also important to note that amenity is also affected by the duration of noise exposure and the frequency of that exposure. The aircraft takeoff sequence creates a transient noise exposure with the Baron 58 taking approximately 18 seconds from commencement of takeoff to achieving a height of 50 ft (15.2 m) above the runway and approximately 32 seconds to traverse 2,500 metres from the commencement of takeoff. The total likely duration of a departure sequence from start-up to a departure point 2,500 metres from the commencement of takeoff would be approximately 11 minutes, including a 5 minute warm-up and checklist period, 5.5 minute taxi period (all at low power settings) and then the final 30 seconds for the actual takeoff sequence. The last 30 second element of the exposure sequence being the period when the noise levels might be described as notable.

Your revised movement frequency of 120 per annum would generate accumulated exposure duration of approximately 1,320 minutes (22 hrs) per annum at low noise levels and 60 minutes (1 hr) per annum at the higher noise levels. It is my opinion that this is a very low exposure in duration, frequency and peak noise levels.

The noise levels of the aircraft while on the landing approach are low due to the low power settings used. The pressure waves emitted by the engine exhaust are low due to the low power needed during approach and the angle of descent of the aircraft will effectively mask the waves from forward projection. The pressure waves generated by the propellers are also reduced significantly at these lower approach power settings, particularly for fixed pitch propellers since the low power setting results in a reduction of engine rpm and subsequently propeller tip speed (the primary source of the pressure waves). This is contrary to jet aircraft operation where some aircraft types require considerable levels of thrust to maintain an acceptable flight path during final approach, particularly in the case of older generation turbojet aircraft. I would suggest that the noise levels emitted would generally be low enough that to a casual observer laterally displaced along a line parallel to the runway centre-line the aircraft would likely go unnoticed until after landing and ground operations commence.

Aircraft Noise Impacts on Habitat and Native Fauna

For the reasons determined previously in this discussion, the impact of the aircraft operations on habitat and native fauna is regarded as low or negligible. The peak noise output of the aircraft is no greater than other forms of domestic and rural machinery equipped with internal combustion engines, in fact in many comparable cases the levels are lower. Additionally, the short duration and low frequency of the noise exposure does not place sustained pressure on ground fauna and birdlife by introducing sustained levels of stress.

The risk of collision with birdlife is low with bird strike research showing that the primary risk areas around aerodromes occur when large numbers of birds are attracted in the close vicinity of the takeoff and landing approach paths due to the presence of food sources or specific nesting habitat within the immediate areas surrounding runway ends. The risk of bird strike is also very species specific. Noting that the Nannup Airstrip (which also meets the standards defined for an ALA) is located approximately 18 km (9.8 Nm) northeast of your proposed ALA, it would be interesting to have access to the environmental impact assessment for this ALA as the distance and nature of the interceding terrain would point to the likelihood of common habitat and bird species.

Collision risk with fauna on the ground, particularly larger animals such as kangaroos, would be subject to appropriate animal management practices such as adequate fencing and proper inspection of the runway and surrounding environment immediately prior to aircraft operations.

Aircraft Emission Requirements and Impacts

Australian Legislative Requirements and International Standards - Emissions

The regulation of aircraft emissions in Australia is provided by the *Air Navigation (Aircraft Engine Emission) Regulations 1995,* which are made under the Air Navigation Act 1920. As with the noise requirements the Australian legislation refers to ICAO Annex 16, however in this case reference is to Volume 2 of that document. Section 4 of the regulations require that only aircraft equipped with turbo-jet or turbofan engines are required to adhere to the Annex 16 standards in relation to smoke and gaseous emissions.

In a separate requirement all aircraft fitted with a turbine engine, including propeller driven turbine engine equipped aircraft, are required to comply with the Annex 16 standards in relation to fuel venting requirements, however only if the aircraft was manufactured after 18-FEB-1982.

The ICAO aircraft engine emissions databank is hosted by the European Union Aviation Safety Agency (EASA) and contains the smoke and gaseous emissions data for a range of aircraft engines in accordance with the requirements of ICAO Annex 16. The introductory statement on the EASA website states the following[6]:

"The ICAO Aircraft Engine Emissions Databank contains information on exhaust emissions of production aircraft engines, measured according to the procedures in ICAO Annex 16, Volume II, and where noted, certified by the States of Design of the engines according to their national regulations. The databank covers engine types which emissions are regulated, ***namely turbojet and turbofan engines with a static thrust greater than 26.7 kilonewtons****."*

This confirms that in both the Australian legislative environment and at international standards level none of the small piston engine equipped propeller driven aircraft types are currently subject to specific regulatory emissions restrictions.

Impact of Emissions by Small Propeller Driven Aircraft

In the real world environment it is certain that all machinery fitted with internal combustion engines produce gaseous by-products of which some are toxic and others contribute to overall degradation of the global environment through the mechanism of global warming. Key elements when evaluating the impact of any specific machine is the nature and accumulated volume of the gases produced during engine operation. In the case of small propeller driven aircraft the nature of the gaseous by-products has been addressed in recent years by advances in the fuels supplied and approved for use by aircraft. The outcome is that the nature of the gases produced is similar to those produced by motor vehicles, especially in the case of the Evektor Harmony which is able to make use of automotive unleaded fuel.

In terms of emission volumes, small aircraft engines produce the same amount as comparable capacity engines used by automobiles and agricultural machinery. The primary issue in terms of total emissions, and therefore the impact on the release of greenhouse gases, is the volume of emissions produced by the entire registered aircraft fleet, the size of which is small by comparison with the number of automobiles currently in operation.

According to data published by the Australian Bureau of Infrastructure and Transport Research Economics (BITRE), in 2019 the total fleet of fixed wing single-engine and multi-engine aeroplanes with reciprocating engines registered in Australia was 9,541 aircraft[7] (of which a number were not actively operating during the previous twelve months), whereas according to data published by the

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[6] <https://www.easa.europa.eu/domains/environment/icao-aircraft-engine-emissions-databank>

[7] <https://www.bitre.gov.au/sites/default/files/documents/australian-aircraft-activity-2019.pdf>; Table 6.

Australian Bureau of Statistics; at 31-JAN-2019 there were 19.5 million[8] registered motor vehicles in Australia and by 31-JAN-2020 this had increased to 19.8 million vehicles. Thus the total fleet of aircraft in Australia that are the subject of this discussion represents 0.049% of the number of reciprocating engine powered motor vehicles registered in Australia during the same period.

The priorities related to reducing the overall emissions output by ground and air transportation are clearly not driven by the size of the light aircraft fleet and its accumulated emissions output. I note that it is common for the emission volumes produced by the worldwide fleet of heavy jet engine powered aircraft to dominate the general understanding that the community has of the impact of air transport on the current environmental issues, hence the focus of ICAO, EASA and the Australian regulators on addressing the emissions output originating from those aircraft types.

The emissions produced by the aircraft that you have identified, combined with the number of annual aircraft movements proposed will have no measurable impact on the surrounding environment of the proposed ALA. The annual accumulated motor vehicle emissions in the nearby town of Nannup would be more significant.

[8] <https://www.abs.gov.au/statistics/industry/tourism-and-transport/motor-vehicle-census-australia/31-jan-2019>

Conclusions

I believe that it is reasonable to advise that operation of the types and categories of aircraft that you have identified at the Aeroplane Landing Area (ALA) that you have proposed for development will have a negligible or limited impact upon the general amenity of the surrounding environment, the neighbouring properties and the habitat of the local fauna.

Within my remit, the impact of potential noise, or the perception of noise, is the primary identifiable issue; however the available documentary evidence demonstrates that the noise output of the aircraft types and categories that you have identified is both regulated and compliant with internationally recognised standards. Further, the transient noise levels likely measured at the nearest 'off-property' dwelling is comparable with or less than that produced by the operation within the yard of that dwelling of common types of domestic and agricultural machinery. Based on the number of aircraft movements proposed, some 120 annually, the frequency of the peak noise exposure appears reasonable, particularly as such exposure is transient at approximately 32 seconds duration and the cumulative annual exposure is approximately 60 minutes.

With respect to the gaseous emissions produced by the aircraft that you have identified, combined with the number of annual aircraft movements proposed, operation of aircraft will have no measurable impact on the surrounding environment of the proposed ALA. The annual accumulated motor vehicle emissions in the nearby town of Nannup would be more significant.

I have attached, where feasible, copies of a number of supporting documents and where it is not practical to include them (usually due to the size) the relevant website source has been identified by way of footnotes throughout this document.

Please note that if the team at the local Council reviewing your development proposal require any clarifications or additional information I am happy to assist.

Yours sincerely,

Robert Potter
Director

List of Attachments

The following pages and documents form attachments to this document:

1. Airservices Australia deemed Noise Certificate for the Baron 58 registered as VH-OVP;
2. Extract from the US TCDS for the Baron 58 showing the MTOW value;
3. EASA Noise Certificate for the Evektor Harmony LSA and Extract from AFM showing the revised MTOW value;
4. EASA Noise Certificate for the Extra NG, also showing the MTOW value;
5. University of Florida: List of Noise Levels for Common Equipment;
6. Extract from the Air Navigation (Aircraft Noise) Regulations 2018 showing Section 6;
7. Extract from the Air Navigation (Aircraft Engine Emission) Regulations 1995 showing Section 4.

APS Attachment #1:

From: Noise, Assessment [mailto:Noise.Assessment@airservicesaustralia.com]
Sent: Thursday, 14 March 2019 2:18 PM
To: Sam Prentice
Subject: Deemed Noise Assessment - VH-OVP [SEC=UNCLASSIFIED]

Dear Awesome Aviation Pty Ltd

COMPLIANCE WITH AIR NAVIGATION (AIRCRAFT NOISE) REGULATIONS 2018
Your Beechcraft Baron 58, serial number TH-2013 with current aircraft registration VH-OVP has been deemed by Airservices to have an Australian noise certificate under Section 12 of the Air Navigation (Aircraft Noise) Regulations 2018. This has been demonstrated through existing international noise certification through FAR 36 using AFM coverpage, page confirming noise certification and FAA TCDS 3A16. The associated certified noise levels for this aircraft are 78.8 dB(A) .

COMPLIANCE WITH AIR NAVIGATION (AIRCRAFT ENGINE EMISSION) REGULATIONS 1995
As your aircraft has a piston engine installed, there are no requirements under Regulation 4 of the Air Navigation (Aircraft Engine Emissions) Regulations 1995.

Establishing Compliance
Not required.

This assessment was based on the information provided by the applicant via the aircraft specifications provided below, AFM coverpage, page confirming noise certification and FAA TCDS 3A16, and any additional references used by the assessment team to support the emissions assessment as described above.

Aircraft Configuration for VH-OVP					
ICAO Type Designation	BE58	***Engine Manufacturer***	Continental	***Propeller Manufacturer***	Hartzell
Serial #	TH-2013	***Engine Model including Engine Type***	IO-550C Piston	***Propeller Model***	PHC-J3YF
Year of Manufacture	2001	***Number of Engines***	2	***- Number of Blades - Diameter***	3 76 inches
Certificate of Airworthiness Categories:	Normal	***Maximum Take-off Weight***	5500lbs		
Other notes:					

This information has been recorded by Airservices Australia in their database; your Record Number for future correspondence regarding this aircraft is 190075. Further information is available on:
http://www.airservicesaustralia.com/services/aircraft-environmental-compliance/

Please be aware that this document confirms your compliance with the Air Navigation (Aircraft Noise) Regulations 2018 based on the evidence provided. Compliance through Section 12 (Deemed) is available to aircraft engaging in air navigation within Australia only.
For aircraft intending to undertake international air navigation, requirements under international regulations may vary and it is the responsibility of the owner/operator to ensure that the documentation held is acceptable.

Kind Regards

Mark Latimore
Senior Environment and Noise Specialist
Airservices Australia
e noise.assessment@airservicesaustralia.com

X. Model 58, Model 58A (cont'd)

Pneumatic Pump Limits

For airplanes S/N TH-1472 through TH-1475, TH-1477 through TH-1486, TH-1488, TH-1490 and TH-1497, TH-1499 through TH-2124, and all other airplanes equipped with Beech Kit Dwg. 58-5012 pneumatic pumps are time limited for engine operation to 600 hours for flight into icing conditions.

C.G. Range (Landing Gear Extended)

Model 58: S/N TH-1 through TH-1395 except TH-1389
(+78.0) to (+86.0) at 5400 lb.
Model 58: S/N TH-1389, TH-1396 through TH-2124 and after
(+78.3) to (+86.0) at 5500 lb. for takeoff
(+78.0) to (+86.0) at 5400 lb. for landing
Model 58A: (+76.6) to (+86.0) at 4990 lb.
Models 58 and 58A: (+74.0) to (+86.0) at 4200 lb. or less
Straight line variation between points given
Landing gear retraction moment (+623 in.-lb.)

Empty Wt. C.G. Range

None

Maximum Weight

Model 58: S/N TH-1 through TH-1395 except TH-1389 5400 lb.
Model 58: S/N TH-1389, TH-1396 through TH-2124
5500 lb. for takeoff
5400 lb. for landing
Model 58A: 4990 lb.

No. of Seats

4 (2 at +75, 2 at +117)
or 5 (2 at +75, 2 at +117, 1 at +150) when Item 603(j) installed
or 6 (2 at +75, 2 at +117, 2 at +150) when Item 603(k) installed

Maximum Baggage and/or Optional Equipment (Structural Limits)

Forward compartment (above floorboard)	300 lb.	(+ 15)
Rear compartment (aft to Sta. 170.00)	400 lb.	(+150)
Aft baggage compartment	120 lb.	(+180)
With third and fourth seats removed for cargo, maximum baggage is as follows:		
Aft of spar cover to Sta. 170.00	400 lb.	(+145)

Fuel Capacity

	Tank	Capacity Gal.	Usable Gal.	Arm
	Baffled or reservoir inter-connected tank system, ea. wing	71 ea.	68 ea.	+82 (With full fuel only)
or	Optional Item 114 Baffled or reservoir inter-connected tank system, ea. wing	86 ea.	83 ea.	+83 (With full fuel only)
or	Optional Item 117 Baffled or reservoir inter-connected tank system with wet wing tip ea. wing	100 ea.	97 ea.	+84 (With full fuel only)

See NOTE 1 for data on unusable fuel.

Oil Capacity

12 qt. ea. engine (+43) (includes 5.5 lb. unusable), total capacity 24 qt.
See NOTE 1 for data on system oil

European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET FOR NOISE

EV-97 VLA

Manufacturer: EVEKTOR-Aerotechnik a.s.

Letecka 1384
686 04 Kunovice
CZECH REPUBLIC

For models: EV-97 VLA

Issue 1, 29 January 2007

List of Effective Pages:

Page	1	2	3
Issue	1	1	1

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APS Attachment: #3

Aircraft Manufacturer *	**Evektor-Aerotechnik a.s.**	Aircraft Type Designation *	**EV-97 VLA**
Engine Manufacturer *	**Bombardier-Rotax GmbH**	Engine Type Designation *	**912 S**
Propeller Manufacturer *	**Evektor-Aerotechnik a.s.**	Propeller Type Designation *	**V 230E**

Additional modifications essential to meet the requirements or needed to attain the certificated noise levels * **None**

Noise Certification Basis **ICAO Annex 16, Volume I** Edition / Amendment Chapter * **10 (Ten)**

EASA Record No.	Maximum Mass Take-off mass * (kg)	Take-off dB(A)	
		Level *	Limit
C4893	**575**	**70.7**	**76.0**

APS Note: The Type Certificate Data Sheet (TCDS) for the Evektor Harmony currently available on the EASA website does not reflect a manufacturer upgrade of the MTOW from 575 kg to 600 kg. The 600 kg MTOW has been accepted by the Civil Aviation Safety Authority (CASA) and applied to this aircraft serial via the published aircraft flight manual.

* Items so marked shall be included on EASA Form 45.

APS Attachment: #3

6-4

Type	HARMONY LSA			Serial. No.:	2011 1417						
Date	Item No.		Description of part or modification	Weight change						Basic weight of empty airplane	
				Added (+)			Removed (-)				
	+	-		Weight (kg or lb)	Arm (mm or in)	Moment (lb.in)	Weight (kg or lb)	Arm (mm or in)	Moment (kg.mm or lb.in)	Weight (kg or lb)	Moment (kg.mm or lb.in)
29.11.2011			Manufactured airplane							381,5 kg	51197

June 01, 2011

APS Attachment: #3

MAXIMUM WEIGHT OF CREW [kg] | Airplane S/N: 2011 1417 | MTOW [kg]:600

Date	Empty weight [kg]	C.G. [% MAC]	FUELLING						Approved	
			Fuel volume		1	0.8	0.6	0.4	0.2	Date	Signature
			Fuel volume [litres]		120	100	75	50	25		
			Fuel weight [kg]		86	72	54	35	18		
29.11.2011	382	11.32	BAGGAGE [kg]	25	107	122	140	158	176	29.11.2011	
				12	120	135	153	171	189		
				0	132	147	165	183	201		
				25							
				12							
				0							
				25							
				12							
				0							
				21							
				12							
				0							

TYPE-CERTIFICATE
DATA SHEET FOR NOISE

No. EASA.A.620

for

Extra NG

Type Certificate Holder:
Extra Aerobatic GmbH
Kirchstr. 158
46514 Schermbeck
Germany

For models: Extra NG

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Type Certificate Holder[1]	**Extra Aerobatic GmbH**	Aircraft Type Designation[1]	**Extra NG**
Engine Manufacturer[1]	**Lycoming**	Engine Type Designation[1]	**AEIO-580-B1A**
Noise Certification Basis	**ICAO Annex 16, Volume I**	Edition / Amendment	Chapter[1] **10 (10.4b)**

EASA Record No.	Propeller Manufacturer [1]	Propeller Type Designation [1]	Additional modifications essential to meet the requirements or needed to attain the certificated noise levels	Maximum Take-off mass[1] (kg)	Take-off dB(A)		See Note
					Level [1]	Limit	
C14337	**MT-Propeller Entwicklung GmbH**	**MTV-14-B-C/C190-130**	**Silencer : Gomolzig EA300-606000**	**950**	**77.1**	**77.9**	-
C14353	**MT-Propeller Entwicklung GmbH**	**MTV-9-B-C/C-198-25**	**Silencer : Gomolzig EA300-606000**	**950**	**77.4**	**77.9**	-

[1] See Note 1.

TCDSN EASA.A.620 Notes

1. Items so marked shall be included on EASA Form 45.

Change Record

Issue	Date	Changes
Issue 1	06 January 2020	Initial Issue
Issue 2	08 June 2020	MTV-9 propeller added

-END-

APS Attachment: #5

Noise Levels for Common Equipment

The following table can be used to determine if employees should participate in the University of Florida's Hearing Conservation Program (HCP). If an employee's use of equipment exceeds the allowable time more than two times per month, that employee needs to be included in the HCP. If an employee uses a piece of equipment that exceeds 85 decibels (dBA), regardless of duration, hearing protectors need to be used. The Noise Reduction Rating (NRR) needed for each piece of equipment is given. For equipment not listed, please contact EH&S at 392-1591 for an evaluation.

Noise Source	Sound Level	NRR Needed	Time Allowed
Airboat	108 dBA	30	2 minutes
Band Saw	104 dBA	26	6 minutes
Blender	91 dBA	13	2 hours
Blower	99 dBA	21	19 minutes
Concrete Saw	112 dBA	34	1 minute
Chain Saw	110 dBA	32	1 ½ minutes
Combine operator	95 dBA	17	48 minutes
Compressed Air	92 dBA	14	1 hr. 35 minutes
Edger	86 dBA	8	6 hrs. 20 minutes
Fire Alarms	95 dBA	17	48 minutes
Front End Loader	95 dBA	17	48 minutes
Hedge Trimmer	103 dBA	25	7 ½ minutes
Juice Extractor	86 dBA	8	6 hrs. 20 minutes
Miter Saw	109 dBA	31	2 minutes
Plant Tissue Grinder	90 dBA	12	2 hrs. 30 minutes
Pneumatic Staking	103 dBA	25	7 ½ minutes
Pressure Washer	100 dBA	22	15 minutes
Radial Arm Saw	103 dBA	25	7 ½ minutes
Riding Lawn Mower	90 dBA	12	2 hrs. 30 minutes
Sprayer, 1,000 gal.	101 dBA	23	12 minutes
Tablesaw	93 dBA	15	1 hr. 16 minutes
Tractor	92 dBA	14	1 hr 35 minutes
Vacuum	87 dBA	7	5 hours
Weedeater	96 dBA	18	38 minutes
Wet/Dry Vac	94 dBA	16	1 hour

Air Navigation (Aircraft Noise) Regulations 2018

made under the

Air Navigation Act 1920

Compilation No. 2

Compilation date:	26 March 2019
Includes amendments up to:	F2019L00372
Registered:	5 April 2019

Prepared by the Office of Parliamentary Counsel, Canberra

Part 2—Noise certification of aircraft etc.

Division 1—General requirements

6 Aircraft must have noise certificate or other approval etc.

Subsonic jet aircraft

(1) A subsonic jet aircraft must not engage in air navigation unless:

(a) both of the following apply:

(i) the aircraft complies with the Chapter 3 standards, the Chapter 4 standards or the Chapter 14 standards;

(ii) a noise certificate is in force for the aircraft; or

(b) all of the following apply:

(i) the aircraft does not comply with the Chapter 3 standards, the Chapter 4 standards or the Chapter 14 standards:

(ii) an approval is in force under section 14 for the aircraft;

(iii) any conditions included in the approval are complied with; or

(c) both of the following apply:

(i) the aircraft is of a kind mentioned in paragraph 7(1)(a) or (b);

(ii) the aircraft is undergoing testing by an inspector to identify whether it complies with the relevant standards for the aircraft; or

(d) the aircraft is undergoing testing required by the Civil Aviation Safety Authority, or an authorised person appointed under the *Civil Aviation Safety Regulations 1998*, to determine whether a certificate of airworthiness should be issued, renewed or validated under those Regulations; or

(e) the aircraft was registered under the *Civil Aviation Regulations 1988* on or before 6 December 1990 and continues to be registered under Part 47 of the *Civil Aviation Safety Regulations 1998*.

Supersonic aircraft

(2) A supersonic aircraft must not engage in air navigation unless:

(a) an approval is in force under section 16 for the aircraft to engage in air navigation; and

(b) any conditions included in the approval are complied with.

Other aircraft

(3) An aircraft that is not a subsonic jet aircraft or a supersonic aircraft must not engage in air navigation unless:

(a) a noise certificate is in force for the aircraft; or

(b) both of the following apply:

(i) an approval is in force under section 14 or 17 for the aircraft;

(ii) any conditions included in the approval are complied with; or

(c) both of the following apply:

(i) the aircraft is of a kind mentioned in paragraph 7(1)(a) or (b);

(ii) the aircraft is undergoing testing by an inspector to identify whether it complies with the relevant standards for the aircraft; or

(d) the aircraft is undergoing testing required by the Civil Aviation Safety Authority, or an authorised person appointed under the *Civil Aviation Safety Regulations 1998*, to determine whether a certificate of airworthiness should be issued, renewed or validated under those Regulations; or

(e) the aircraft was registered under the *Civil Aviation Regulations 1988* on or before 6 December 1990 and continues to be registered under Part 47 of the *Civil Aviation Safety Regulations 1998*.

Offence

(4) The operator of an aircraft commits an offence if:

(a) the aircraft engages in air navigation; and

(b) subsection (1), (2) or (3) (as the case requires) is not complied with.

Penalty: 20 penalty units.

(5) Strict liability applies to subparagraphs (1)(a)(i), (b)(i) and (ii), (c)(i), paragraph (2)(a) and subparagraphs (3)(b)(i) and (c)(i).

Air Navigation (Aircraft Engine Emissions) Regulations

SR 1995, No. 277 as amended

made under the

Air Navigation Act 1920

Consolidated as in force on 18 August 1998

(includes amendments up to SR 1997 No. 80)

Prepared by the Office of Legislative Drafting,
Attorney-General's Department, Canberra

Part 2 Aircraft to comply with Annex 16

4 Aircraft not to fly unless it complies with Annex 16

(1) Subject to regulations 5 and 6, an aircraft must not be flown if:

(a) in the case of an aircraft the manufacture of which was completed after 18 February 1982:

(i) it does not comply with the fuel venting requirement specified in Part II of Volume II of Annex 16; and

(ii) it is fitted with an aircraft turbine engine; or

(b) it is fitted with a turbo-jet or turbofan engine intended for aircraft propulsion at supersonic speeds:

(i) that does not comply with the requirements, relating to smoke emissions and gaseous emissions, specified in Part III of Volume II of Annex 16 to apply to that type of engine; and

(ii) the manufacture of which was completed on or after 18 February 1982; or

(c) it is fitted with a turbo-jet or turbofan engine intended for aircraft propulsion only at subsonic speeds:

(i) that:

(A) in relation to smoke emissions — does not comply with the requirements specified in Part III of Volume II of Annex 16 to apply to that type of engine; and

(B) the manufacture of which was completed on or after 1 January 1983; or

(ii) that:

(A) in relation to gaseous emissions — does not comply with the requirements specified in Part III of Volume II of Annex 16 to apply to that type of engine; and

(B) has a rated output greater than 26.7 kilonewtons; and

(C) the manufacture of which was completed on or after 1 January 1986.

(2) If an aircraft is flown in contravention of this regulation, the operator of the aircraft is guilty of an offence.

Penalty: 50 penalty units.

Note For the value of a penalty unit, see s. 4AA of the *Crimes Act 1914*. At the date of commencement of these Regulations, the value of 1 unit is $100.

5 Transitional arrangements

Regulation 4 does not apply to an aircraft:

(a) of the kind described in paragraph 4 (1) (a) — if the aircraft:

(i) was registered under the Civil Aviation Regulations immediately before the commencement of these Regulations; and

(ii) continues to be so registered;

unless, if the aircraft was so designed and constructed as to prevent intentional fuel venting, a modification of the aircraft that occurs after the commencement of the Regulations allows intentional fuel venting; or

(b) in relation to an engine of the kind described in paragraph 4 (1) (b) or (c):

(i) if:

(A) the engine is of a type that was in the possession of the aircraft operator immediately before the commencement of these Regulations; and

(B) engines of that type have remained in the possession of the operator since the commencement of these Regulations and been in use for a purpose relating to the operation of the aircraft; or

(ii) if:

Whisperwind

Annexure B

Engineering Design

Bridgetown Surveyors Pty Ltd

ROGER MACHIN
LICENSED SURVEYOR

" Servicing the Lower South West and Central Great Southern since 1978 "

p. 0498 644 015
a. Shop 5, 159 Hampton St Bridgetown 6255
PO Box 276 Bridgetown 6255
w. www.bridgetownsurveying.com.au
e. roger@bridgetownsurveying.com.au
abn. 30 458 384 068

Proposed Driveway/Private Airstrip for

Evernow Pty Ltd ATF WHISPERWIND

40 Rivergum Way

Darradup

Shire of Nannup

January 2021

Airstrip Design

This outline provides the basic information that should satisfy the requirements to obtain DA approval.

The full design will involve input from professional services including;

- Licensed Surveyor
- Geotechnical engineering of earthworks
- Hydraulic design for runway water shedding
- Bitumen design

Two alignments have been investigated.

1. Eastern Alignment (Option 1) ..... 900 m / optional 1000 m
2. Western Alignment (Option 2) ..... 900 m

Please note - the airstrip serves 2 purposes:

1. Runway
2. Roadway to residence at north end of strip

Credentials of R.A.S. Machin - Licensed Surveyor

I have been a qualified surveyor since 1969 and a Licensed Surveyor in WA since 1971 and Papua New Guinea since 1973

I have spent 16 years in PNG where the bulk of my work was on investigation, design, and construction of roads in extremely rugged terrain.

In the period 1991 – 1996 inclusive, I was Project Surveyor on the Kutubu Oilfield, where I was with my team of 10 surveyors responsible for investigation , design and construction of

- More than 100 km of roads linking well pads to production facilities and accommodation villages.
- 1800 m Jet standard aerodrome
- Many oil production facilities.
- Laydown areas

The Kutubu Oilfield is in the Southern Highlands of PNG and is in extremely rugged mountainous terrain.

Also, in PNG, I had significant involvement with aviation with certification of aerodromes and upgrading existing strips.

In past 5 years in WA, a large portion of my work is earthworks design and construction of dams for agriculture.

In 2016, I was involved in the design and construction of a 2 GL dam + realignment of 1 km of road at Quininnup.

Since 2016, I have been doing investigation and design of a 5 GL dam at Manjimup and construction of that dam has just commenced.

Specifications of airstrips

#	Item	East Strip (Option 1)	West Strip (Option 2)	Notes
1	Maximum Take Off Weight	5700 KG	5700 KG	
2	Length of runway	900 m / 1000 m optional	900 m	
3	Sealed runway	20 m bitumen runway with 2 m gravel shoulders = 24 m total width	20 m bitumen runway with 2 m gravel shoulders = 24 m total width	Bitumen design to be arranged
4	Runway specifications • Base coarse • Gravel top	300 mm minimum thickness 150 mm high quality gravel	300 mm minimum thickness 150 mm high quality gravel	Runway construction will be done with self-elevating scrapers which blends the material which will consist of clay, gravel, and sand. This material will be compacted to standards set by a GEOTECHNICAL consultant.
5	Runway side strips	20 m from edge of bitumen seal	20 m from edge of bitumen seal	This strip will be compacted to allow for revegetation with pasture grasses. It is compacted to standard that is safe for aircraft in emergency situations but allows for grass to grow.
5A	Runway – end design	Both ends will have widenings	Both ends will have widenings	The widenings on ends effectively widens strip to 30 m (turning circle at the ends only). This is to enable easy turning of aircraft.
6	Water shedding from Runway			Most of the runoff from the bitumen will be absorbed by the side strips / grassed area. High volume run off will be captured by side drains that can only be designed once the full engineering design is completed. Normally this is achieved with OFF SHOOTS at approx. 150 m intervals dispersing water into contour banks with riffles to dissipated water into adjoining pasture.
7	Water shedding + Blackwood River			The Hydraulic Consultant will design the project to restrict/mitigate runoff from the runway from entering the Blackwood River.
8	Runway Gradients	Ch 00 to chn 200 is a long vertical curve. Chn 200 + is an average of - 3.4 %	Starting at Ch 00 gradient is – 1% then incrementally + uniformity every 100 metres to maximum of 2 %	
9	Angle of approach to threshold from north	Less than 5 %	Less than 5 %	
9A	Angle of approach to threshold from south	Not applicable	Less than 5 %	
10	Source of construction materials	All available on site	All available on site	Except for bitumen materials

#	Item	East Strip (Option 1)	West Strip (Option 2)	Notes
11	Construction time	Approximately 30 working days	Approximately 30 working days	
12	Construction equipment	1 bulldozer 1 excavator 1 vibrating compactor 3 elevating scrapers 1 grader 1 water cart	1 bulldozer 1 excavator 1 vibrating compactor 3 elevating scrapers 1 grader 1 water cart	

Closing comments

Whilst this may appear a significant project, it is in terms of earthmoving projects, a relatively small and straightforward one. In my experience with surveying and constructing roads and aistrips, this project will not pose any extraordinary challenges. Final design may have minor practical variations to accommodate any factors that arise during the construction process.

Yours faithfully,

Roger Machin

Licensed Surveyor

Attachments:

Concept Plans

Gradient Profile

SEE SHEET 2
FOR ALL PROJECT DETAILS

N

SCALE 1 : 5000 @A3

0 50 100 150 200

ALL DISTANCES ARE IN METRES

PLAN NOTES :
- CONTOUR INTERVAL IS 5 METRES
- AERIAL PHOTOGRAPHY AND ALL DIMENSIONS SHOWN WERE SOURCED FROM LANDGATE (WA) 19.1.2021.
- NOTE THAT THIS PLAN IS NOW SUITABLE FOR FORMAL SUBMISSION.
- IN LIGHT OF THE ABOVE REVISION/S,THIS PLAN WILL THEN BE SUBJECT TO APPROVAL FROM VARIOUS AGENCIES.

Applicant / Proprietor :

EVERNOW PTY LTD trading as 'WHISPERWIND'

CURRENT LAND DESCRIPTION :
LOT 2 ON FREEHOLD DIAGRAM 70077,
No.40 RIVERGUM WAY, DARRADUP WA 6275,
Cert. Title No. Vol 1739 Fol 633
Proprietor/s : I.R. & D.C. GIBB

LOCALITY DARRADUP
LGA SHIRE OF NANNUP
DISTRICT NELSON

WESTERN AUSTRALIA

APPLICATION PLAN

FOR (BITUMISED) ROAD ACCESS & PRIVATE AIRSTRIP :

ON LOT 2 ON DIAGRAM 70077
ADDRESSED AS No.40 RIVERGUM WAY
DARRADUP WA 6275

ROGER MACHIN
LICENSED SURVEYOR

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Plan Drafted 22.1.2021

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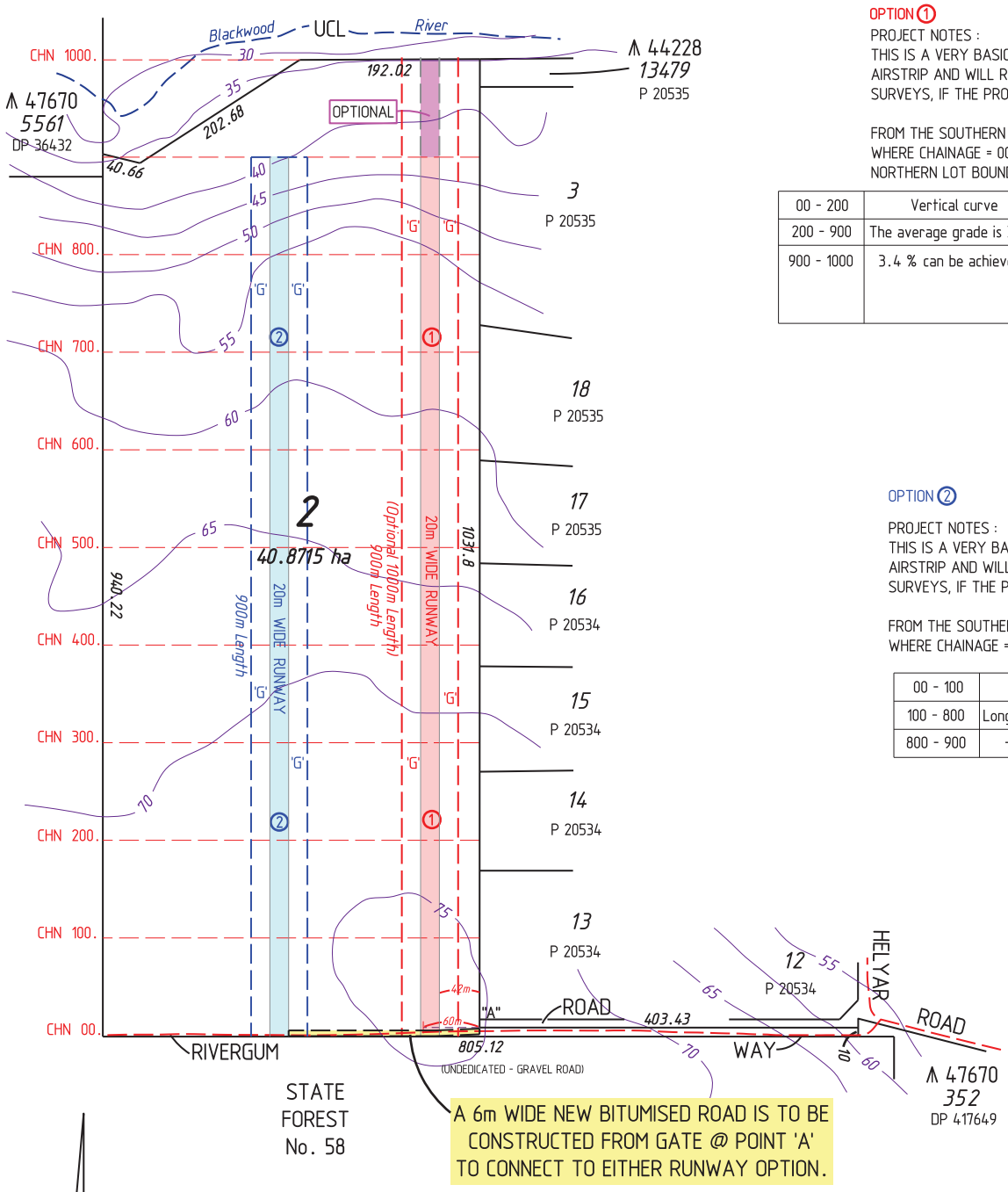
LEGEND

- UNSEALED/GRAVEL ACCESS ROAD/TRACK
- 690 — LOT BOUNDARY LINE (WITH DIMENSION)
- 60 — CONTOUR LINE (WITH LEVEL- AHD)
- CENTRE LINE OF WATER COURSE (BROOK, CREEK, RIVER etc)
- ① ② PROPOSED OPTIONS FOR AIRSTRIP LOCATIOIN
- 'G' DENOTES SIDE STRIPS



A 6m WIDE NEW BITUMISED ROAD IS TO BE CONSTRUCTED FROM GATE @ POINT 'A' TO CONNECT TO EITHER RUNWAY OPTION.

OPTION ①

PROJECT NOTES :
THIS IS A VERY BASIC OUTLINE OF THE PROPOSED AIRSTRIP AND WILL REQUIRE FURTHER DETAILED SURVEYS, IF THE PROJECT IS APPROVED.

FROM THE SOUTHERN LOT BOUNDARY, WHERE CHAINAGE = 00. TO THE NORTHERN LOT BOUNDARY = 1000.

00 - 200	Vertical curve	Basically 00 - 50 is level
200 - 900	The average grade is 3.4 %	Modest cut & fill
900 - 1000	3.4 % can be achieved	This will require substantial fill that could be as high as 50,000 BCM

OPTION ②

PROJECT NOTES :
THIS IS A VERY BASIC OUTLINE OF THE PROPOSED AIRSTRIP AND WILL REQUIRE FURTHER DETAILED SURVEYS, IF THE PROJECT IS APPROVED.

FROM THE SOUTHERN LOT BOUNDARY, WHERE CHAINAGE = 00. (HEADING NORTHWARDS)

00 - 100	-1 % grade
100 - 800	Long Vertical curve
800 - 900	-2 % grade

SCALE 1 : 5000 @A3

0 50 100 150 200

ALL DISTANCES ARE IN METRES

SEE SHEET 3 FOR THE PROPOSED AIRSTRIP DESIGN GRAPHICS

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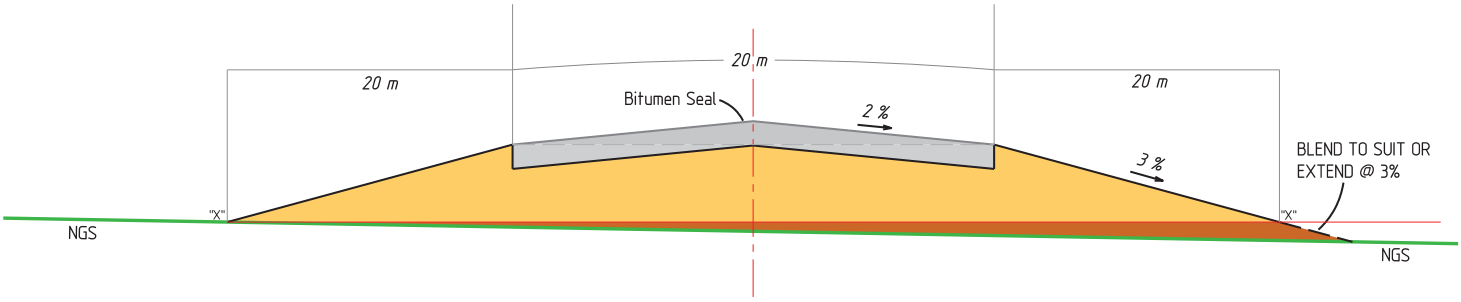
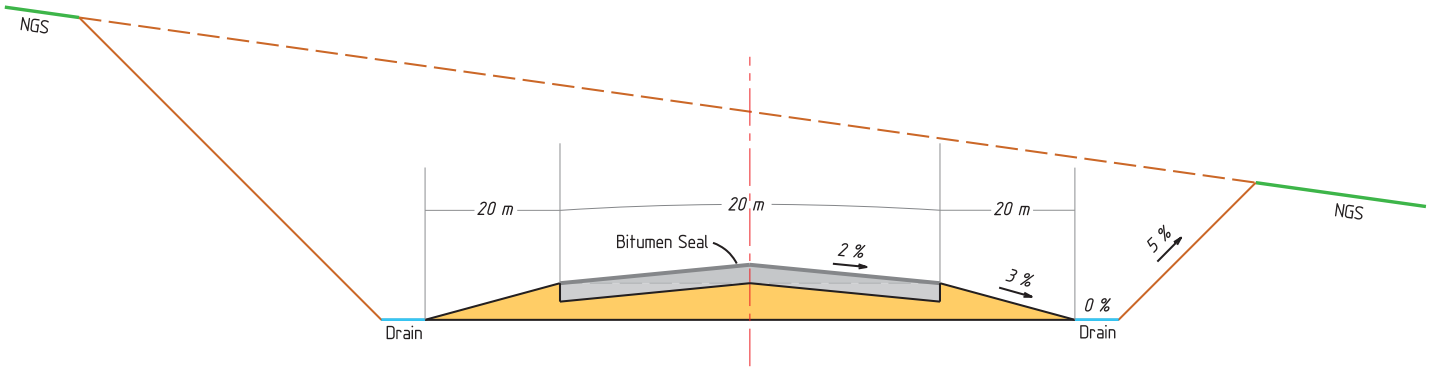
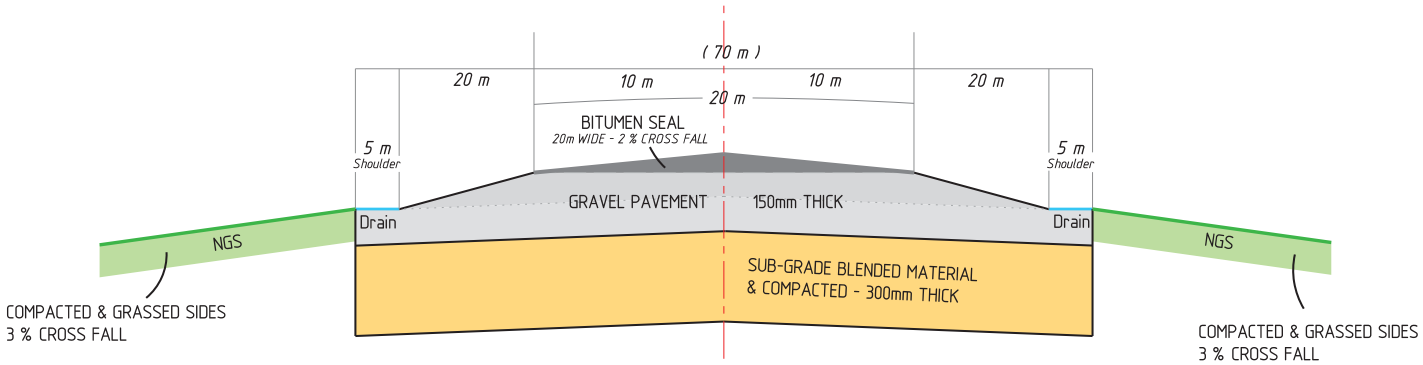
LINE "X" - "X" REPRESENTS THE **LEVEL** SURFACE ACROSS THE RUNWAY PROFILE
NGS - REPRESENTS THE NATURAL GROUND SURFACE



CROSS-SECTION OF FORMATION IN FILL
(NOT TO SCALE)



CROSS SECTION OF FORMATION IN CUT
(NOT TO SCALE)

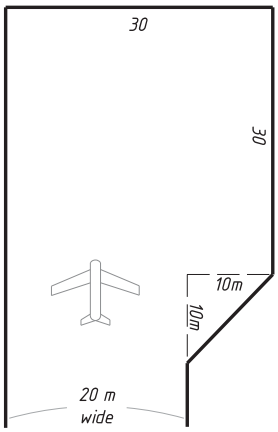


CROSS SECTION OF RUNWAY PAVEMENT
(NOT TO SCALE)

ATYPICAL END TURNING DESIGN
(at each end of runway)

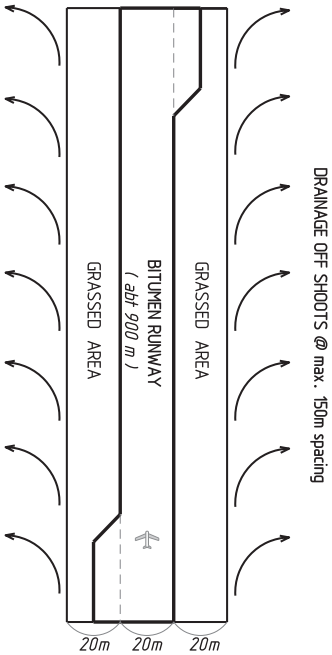
THIS GRAPHIC IS NOT DRAWN TO SCALE

ALL DIMENSIONS SHOWN ARE IN METRES



DRAINAGE CONCEPT DESIGN

THIS GRAPHIC IS NOT DRAWN TO SCALE



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Whisperwind

Annexure C

Proposed Conservation Covenant Placement

ANNEXURE C

Proposed Conservation Covenant Placement