

Memorandum

To	Confidential	Date	16 April 2021
Copies	Andrew Cowan Travis Lythall	Reference number	SYD05-06-07_Y-R-0012
From	Arup	File reference	
Subject	SYD05 Kemps Creek Data Centre – Airport Safeguarding technical memo		

This memo addressed the requirements of section 2.1.1 of the Draft Mamre Road Development Control Plan (DCP, Department of Planning, Industry and Environment, 2020) relating to aviation safeguarding around the proposed Western Sydney (Nancy Bird) Airport. Essentially in this regard, the draft DCP sets out the aims to; prevent airspace intrusion, protect interference with avionics and landing instrumentation, and remove any distractions or conflicts for pilots.

The following sections respond to each element of the draft DCP.

1 Heights

The height of buildings, structures, landscaping, and cranes do not impact on the operations of the Airport or create a hazard to the safe navigation of aircraft. Buildings and any ancillary structures must not encroach into protected airspace.

A review of the obstacle limitation surface (OLS) mapping for the proposed Western Sydney Airport indicates a clearance height of between 190 to 210 metre above existing ground level at the development site. Based on current design, the highest development point relates to the exhaust stack resulting from operation of onsite generators. This is proposed to be 20 metres above finished ground level (maximum). This is well below the OLS. There is also ample clearance room if the future stages are built once the airport is operational.

2 Noise

Development is constructed in accordance with Australian Standards AS2021 – Acoustics Noise Intrusion – Building Siting and Construction.

A review against these requirements indicates the site does not fall within the contours requiring an assessment to be undertaken. Additionally, the standard is applicable only to aviation noise, and therefore not relevant for the site.

Renovations to existing houses or minor extensions within ANEC/ANEF 20 and above must be constructed in accordance with Australian Standard AS2021 – Acoustics – Aircraft Noise Intrusion – Building Siting and Construction. Protection of Operational Airspace.

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The site does not fall within the contours requiring an assessment in accordance with AS2021.

3 Protection of operational air space

Development does not create a permanent or temporary physical or transient obstruction in the operational airspace of the Airport and complies with the [Commonwealth] Airports Act 1996 and [Commonwealth] Airports (Protection of Airspace) Regulations 1996.

No structure or building within the development site would penetrate the proposed OLS or Procedures for Air Navigation Services – Aircraft operations (PNS-OPS). The development therefore complies with the Commonwealth *Airports Act 1996* and *Airports (Protection of Airspace) Regulations*.

4 Lighting

Development does not impact on the operational aspects of the Airport with regard to light emission and reflective surfaces.

Based on the architectural finishes, there would be no reflective materials on the building façades.

The external lighting would be designed in accordance with AS 4282-1997: Control of the Obtrusive Effects of Outdoor Lighting (Standards Australia, 1997). This means light spill would be minimised, while surface glare would be reduced through effective material selection. This design requirement and need to comply with the above Standard would be sufficient to achieve the above requirement.

External lighting must be downlights or shrouded lights.

External lighting would be designed in accordance with the above Australian Standard, which includes the use of directional lighting which avoids any future aviation risk.

5 Emissions

Development must not generate emissions into the protected airspace.

The only onsite emission source would be from the diesel back-up generator exhausts. As discussed in the EIS, these would be used on rare occasions for a few minutes in the event of an outage. They would also be periodically tested.

Based on computational fluid dynamic (CFD) modelling, the anticipated size and output of the onsite generators would generate an exit velocity of around 60m/s from a relatively small exhaust pipe. The proposal is to locate these exhaust pipes 20 metres from the ground. They would be vertically orientated. The CFD modelling predicts that the exhaust emissions would dissipate well below the OLS as described below.

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Any plumes do not:

- Have peak vertical velocities of more than 4.3m/sec.

The CFD assessment evaluated the potential hazard to airport operations from equipment that creates vertical exhaust plumes. The Plume Rise Assessments Guideline (AC 139-05 v3.0, Civil Aviation Safety Authority, CASA, January 2019) identifies the need to assess the potential hazards to aviation where the vertical exit velocity from gas efflux or exhaust plume exceeds 6.1 m/s. The generators considered for development site, have generally much higher exhaust speeds but from smaller diameter exhaust stacks. This is predicted to result in the exit plumes dissipating very quickly, due to decreasing momentum in a vertical direction.

As can be seen in Figure 1 below, which is a snapshot extracted from the CFD modelling, the exhaust flow quickly dissipates from a velocity of 38.4 m/s around 20 metres above the ground to less than one metre per second at the OLS. Therefore, the exhaust plumes from the equipment in the site are not expected to impact aircraft operations.

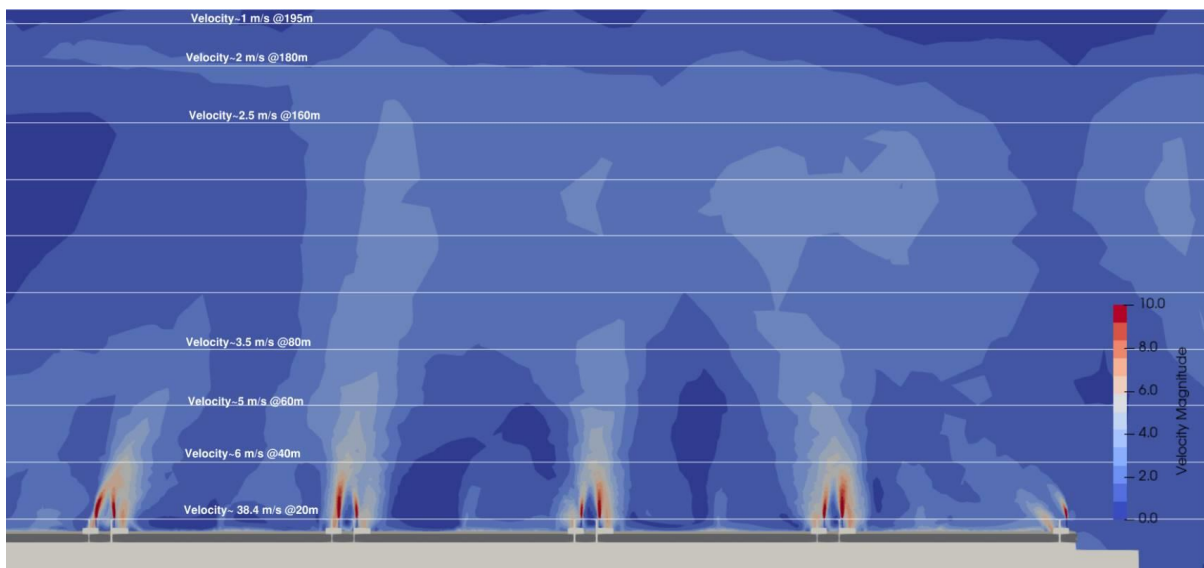


Figure 1 | CFD Plume modelling (source: ARUP 2021)

Development must not incorporate flares

No flaring would take place at site. The only emissions are the generator exhausts.

6 Wildlife Hazards

These responses are further detailed in SYD05-06-07_Z_R-0008 (Waste Management Plan),

Development must not attract wildlife which would create a safety hazard in the operations of the Airport. All waste bins are to be designed and installed with fixed lids. Any bulk waste receptacle or communal waste storage area must be contained within enclosures that cannot be accessed by birds or flying foxes.

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The proposed waste management practices onsite have been specifically designed not attract wildlife. This is inherently a good site management practice that would additionally minimise the safety risk of operating the Airport. More specifically:

- All waste bins would be designed and installed with fixed lids and there would be little organic waste resulting from operation of the facility
- The waste storage room would be fully enclosed and walled. This would ensure that these areas could not be accessed by birds or flying foxes.

Any stormwater detention within the 8km wildlife buffer is to be designed to fully drain within 48 hours after a rainfall event.

All stormwater would be directed offsite to a centrally located detention basin that would be installed as part of the wider masterplan. The proponent would not be responsible for the design, capacity, management, or drainage of the basin. No onsite retention or detention is proposed.

7 Communications, Navigation and Surveillance Systems

Development must not impact upon communication, navigation, and surveillance systems.

The site Wi-Fi and Radio-Over-IP (ROIP) systems are expected to be the only radio frequency (RF) emitting system installed onsite. The Wi-Fi system would operate on approved 2.4GHz and 5GHz bands in accordance with IEEE 802.11 requirements. The ROIP system would operate on the UHF band (450-470MHz), and the effective radiated power (ERP) of the ROIP system would comply with Australian Communications and Media Authority (ACMA) requirements.

Due to the above, it is not anticipated that the above systems will impact airport operations.

Development within the building restricted area does not create electromagnetic field radiations that will interfere with signals transmitted by the communication, navigation, or surveillance facility.

As per response above, the project does not include an EMF source and therefore will not impact or interfere with signals transmitted by the communication, navigation or surveillance facility of the airport.

8 Windshear and Turbulence

Development must not generate windshear and/or turbulence.

Evaluation of the proposed development on wind characteristics for landing aircraft was reviewed in accordance with National Airport Safeguarding Framework NASF Guideline B (Department of Infrastructure, Regional Development and Communications, 2018). Buildings that could pose a safety risk are those located within a rectangular ‘assessment trigger area’ around the ends of the runway (as shown in red below), which is outlined as per Figure 2 below which references:

- 1,200 m or closer perpendicular from the runway centreline (runway shown in grey below)

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- 900 m or closer in front of runway threshold (towards the landside of the airport)
- 500 m or closer from the runway threshold along the runway.

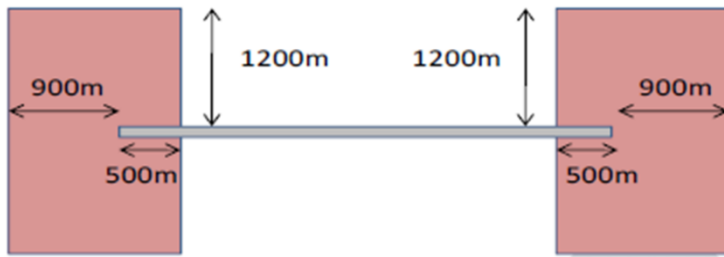


Figure 2 Assessment trigger area around runways (source: NSAF, 2018)

As the project site is located approximately 3 km from the edge of the closest runway threshold, the development is not expected to generate wind shear and/or turbulence for airport operations.