> Airspace Protection

Camden Airport

Master Plan
2004/05

> Airspace Protection

17.1 Airspace Protection Overview

The protection of the airspace surrounding airports is a critical component of maintaining a safe operating environment for current traffic types and levels as well as for future traffic types and levels.

Consequently, it is necessary to restrict some types of development and land uses in the vicinity of airports. This ensures that airspace required to facilitate aircraft operations remain obstacle free and hence contribute to the safety and efficiency of those operations.

In order to facilitate broad community understanding of these restrictions, the following aspects are provided below:

- description of the regional airspace and operating procedures;
- prescribed airspace Obstacle Limitation Surfaces (OLS) and Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS);
- external lighting limitations; and
- stack and vent efflux limitations.

17.2 Regional Airspace

17.2.1 General Overview

Airservices Australia is responsible for airspace management within the Sydney Basin, as well as elsewhere in Australia. The airspace within the Sydney Basin is dominated by the Sydney Airport Control Zone (CTR) and the requirement to efficiently manage the large volume of domestic and international aircraft movements into and out of the airport.

The Sydney Airport Control Area (CTA) is comprised of a series of controlled airspace blocks, ascending in vertical steps, and extending out to a maximum radius of 45 nautical miles (NM) at its greatest dimension. The Airservices Australia Sydney Terminal Control Unit (TCU) provides traffic management and separation within the airport CTA and CTR. Aircraft take off and landing clearances, as well as ground movements are handled by the Sydney Control Tower.

The Bankstown Airport CTR extends out 3 NM from the airport, except where it would otherwise overlap the Sydney Airport CTR to the east. To prevent overlapping CTRs, the Bankstown Control Zone is truncated to approximately 2 NM from the airport. The ability of Bankstown and Sydney Airports to operate independently is predicated on the ability of aircraft using Bankstown to remain within the airport's CTR and to not infringe on Sydney Airport airspace.

Under visual flight rule (VFR) conditions when the ATCT is in operation, all aircraft operating at Bankstown are required to follow General Aviation Airport Procedures (GAAP) within the airport's CTR. When the ATCT is closed, pilots are required to report their position under Mandatory Broadcast Zone (MBZ) procedures. However, under proposed changes to the National Airspace System (NAS), MBZ procedures may be replaced in the future by use of Common Traffic Advisory Frequency (CTAF) or some similar requirement. During instrument fight rule (IFR) conditions, the Sydney TCU provides separation services for instrument arrivals and departures at Bankstown.

However, IFR traffic into and out of Bankstown must be managed in association with and sequenced relative to aircraft traffic at Sydney Airport.

Camden Airport has a CTR and GAAP procedures are used to maintain traffic separation during the hours the control tower is in operation. When the control tower is closed, MBZ procedures are in effect.

There are six flying training areas within the Sydney Basin. The areas are encompassed within an area bounded by a line extending from the western boundary of the Bankstown CTR to the Richmond CTR then to the Blue Mountains, Camden, Hoxton Park and back to the Bankstown CTR. The training areas are designated (Class G) uncontrolled airspace which extends from the surface up to the base of the overlying CTA step at 4,500 feet. Bankstown, Camden and Hoxton Park Airports are reported to be the predominant source of flying training activity using this area.

Regional airspace allocations within the Sydney Airport CTR are depicted in Figure 19.

> Figure 19

Regional Airspace

> Airspace Protection

17.2.2 Airport Control Zone

Camden Airport is located within the General Aviation Control Zone. The airport has an ATCT, however it is currently open only during daylight hours on weekends and public holidays when aviation activity at the Airport is at its peak. Airservices Australia provides air traffic control services when the ATCT is in operation. When the ATCT is open, the airport operates under GAAP. When GAAP is in effect, there are five designated approach points and associated routes to the airport including:

- The Oaks, 6 NM west south-west on a radial of 56 degrees M;
- Mayfield, 6 NM north-west on a radial of 138 degrees M;
- Bringelly, 7 NM north north-east on a radial of 189 degrees M;
- Menangle, 6 NM south-east on a radial of 318 degrees M; and
- Picton, 9 NM south southwest on a radial of 12 degrees M.

Camden Airport reverts to MBZ procedures when the ATCT is closed. Under MBZ procedures, pilots are responsible for maintaining separation from other aircraft.

One runway is used for arrivals and departures while the other runway is used for circuit training and touch and go operations. The flight patterns for powered fixed wing aircraft are restricted to the north to north-west side of the airport with right-hand traffic required for Runways 24 and 28. Glider operations are kept south to south-east of Runway 10/28.

Circuit training is restricted to the hours of 6:15am and 11:00pm Monday through Friday, and 6:15am and 8:00pm Saturday and Sunday.

Circuit training is conducted at 1,300 feet AGL. Aircraft depart on runway heading or on the extended crosswind leg and maintain 1,300 feet until clear of the CTR, ensuring they remain clear of the GA approach points and associated routes. Arriving aircraft enter the CTR at 1,800 feet and maintain this altitude until receiving sequencing instructions. Overflying aircraft must maintain an altitude of at least 1,800 feet.

Helicopters must follow GAAP CTR procedures unless otherwise approved by ATC. Helicopter circuit altitude during daylight hours is 1,000 feet and 1,300 feet at night. During daylight, the helicopter circuit lies inside the fixed wing aircraft circuit. At night, helicopter circuit training conforms to the fixed wing circuit pattern.

When the ATCT is open, glider operations are noted by Automated Terminal Information Service (ATIS). When the tower is closed, gliders are required to follow MBZ procedures.

17.2.3 Available Approaches

The airport has an NDB transmitter on site and there is a published NDB circling approach procedure for the airport with a minimum descent altitude of 1,289 feet (1,050 feet AGL) for Category A and B aircraft.

The approach is reported to be of limited benefit during instrument meteorological conditions (IMC) due to the high minima. The NDB approach is primarily used for training and flight proficiency purposes and is used about 100 times per month. Most of the aircraft using the NDB approach are reported to be from Bankstown Airport.

There is also a Global Positioning System (GPS) approach published for Runway 06 with a minimum descent altitude of 930 feet (700 feet AGL) for Category A and B aircraft.

17.3 Prescribed Airspace

The Airports Act 1996 requires the production of prescribed airspace plans for airports. Under the Airports (Protection of Airspace) Regulations, prescribed airspace is defined as airspace above any part of the OLS or PANS-OPS surfaces.

The object of prescribed airspace is to ensure that the airport is not adversely affected by the building of structures in the area used by arriving and departing aircraft. The prescribed airspace plan which represents the OLS and PANS-OPS surfaces gives airport operators guidance in protecting critical surfaces that affect instrument approach minimum altitudes.

17.3.1 Obstacle Limitation Surface

The OLS at Camden Airport are defined under CASA Manual of Standards (MOS) Part 139 – Aerodromes, Section 7.3 and Regulation 4 of the Airports (Protection of Airspace) Regulations. The OLS are comprised of a series of imaginary planes surrounding an airport, which must be kept free and clear of obstructions that could be hazardous to aircraft taking off or landing at the facility. The surfaces are intended to prevent development of airspace obstructions that could adversely impact air navigation or the usability of the facility. The height restrictions imposed by the OLS are determined based on the following factors:

- the intended use of the runway, i.e. for take-off, landing or both;
- the runway code as determined by the runway length and type of aircraft using the runway; and
- type of approach, i.e. non-instrument, non-precision or precision instrument.

Extending off the end of each runway, the OLS standards define both a "take-off climb" surface and an "approach surface" for landing. Where take-offs and landings may occur in either direction along a runway, the more restrictive approach surfaces for landings should be used in determining obstacle height restrictions. At Camden Airport, it is assumed that take-offs and landings may occur in either direction of the runways and therefore the landing approach surfaces are used in this analysis.

Surrounding the runway pavement is the Runway Strip. The Runway Strip is defined as an area including the runway and stopway, if any, intended to reduce the risk of damage to aircraft running off the runway surface, and to protect aircraft flying over it during take-off or landing. The dimensions of the Runway Strip determine where the OLS surfaces begin and are defined based on the width of the runway pavement, type of aircraft using the runway, and level of precision approach capability available.

There is no change to the current OLS as a result of the Aviation and Non-Aviation development concepts.

The OLS for Camden Airport are depicted in Figure 20.

17.3.2 PANS-OPS

At airports with instrument approach capability, radio-navigation aids enable aircraft to operate safely in poor weather conditions. PANS-OPS surfaces are established to protect those stages of take-off, landing or manoeuvering, when aircraft are operating in non-visual (instrument) conditions.

Pilots must be assured of obstacle clearance in these circumstances, although transition from or to visual conditions will still occur at some point in the flight.

The International Civil Aviation Organisation standards for PANS-OPS surfaces require surfaces to be defined for each published procedure, for aircraft operating in accordance with that procedure. The PANS-OPS surfaces should not be infringed in any circumstance. The PANS-OPS surfaces at Camden Airport are not complex due to the limited number and kind of procedures.

There is no change to the current PANS-OPS as a result of the Aviation and Non-Aviation development concepts.

The PANS-OPS Surfaces for Camden Airport are shown in Figure 21.

17.4 Restrictions to External Lighting

CASA provides aerodrome operators with guidance on protecting aircraft operations from adverse impacts resulting from ground lighting, particularly during the landing phase of flight. Furthermore, under regulation 94 of the Civil Aviation Regulations 1988 (CAR 1988), CASA has the authority to require lights which may cause confusion, distraction or glare to pilots in the air to be extinguished or modified. Pilot confusion or distraction may be the result of lighting colour, position, pattern or intensity of emission above the horizontal plane.

Should the owner of property creating a lighting hazard fail to take remedial action once they have been notified, CASA is authorised under the regulations to make modifications to remove the hazard at the property owner's expense.

General guidance is provided for situations where lights are to be installed within a 6 km radius of the aerodrome as lights within this area are considered most likely to fall under the provisions of regulation 94 of CAR 1988.

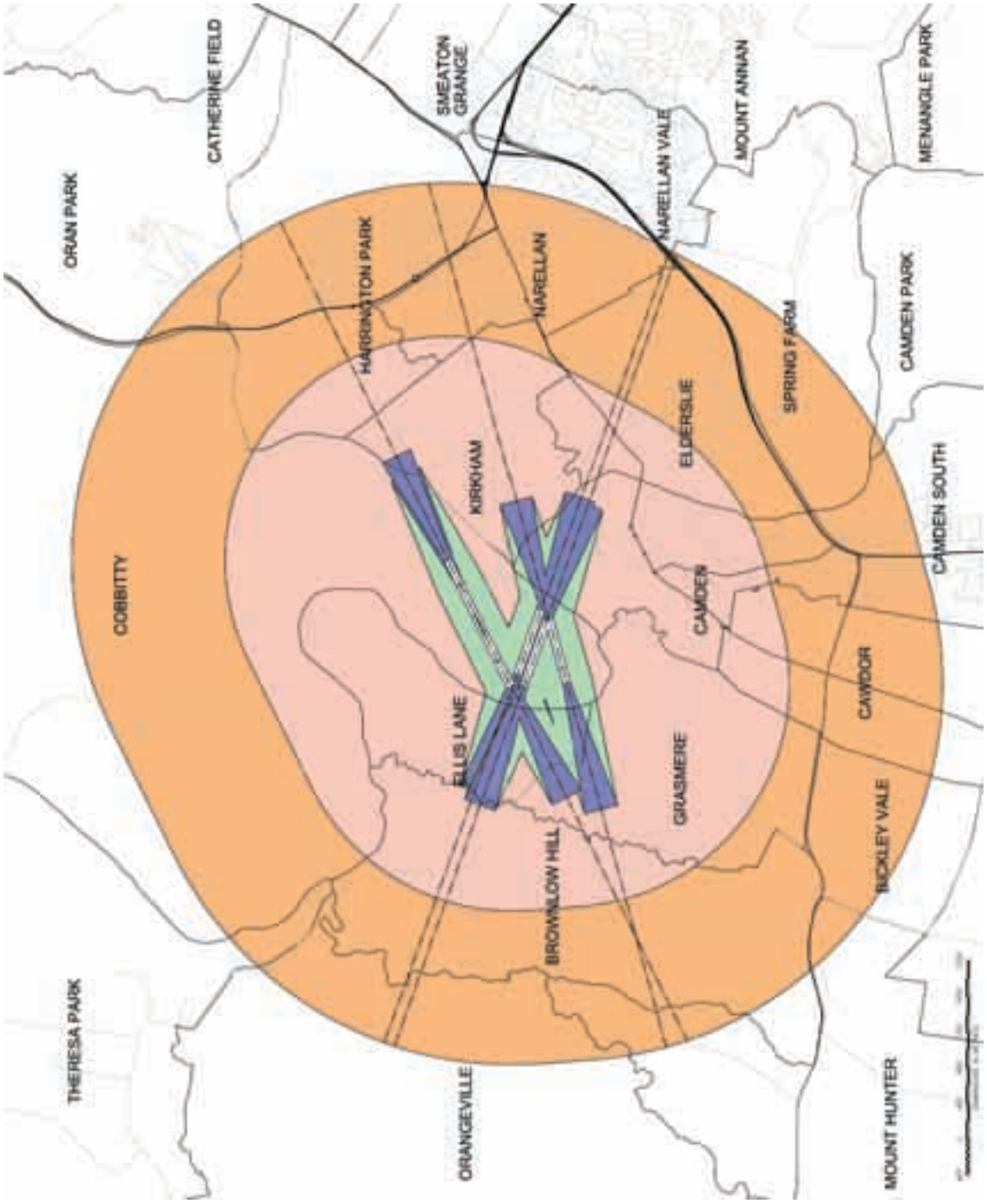
> Figure 20

Camden Airport Obstacle Limitations Surfaces

LEGEND

- APPROACH SURFACE (4% SLOPE)
- TRANSITIONAL SURFACE (20% SLOPE
- CONICAL SURFACE (5% SLOPE)
- INNER HORIZONTAL SURFACE (115M AHD)
- EXTENDED RUNWAY CENTRELINE

NOTE: DENOTES OLS SURFACES BUT DOES NOT HOW ANY PENETRATIONS THAT MAY EXIST.



Further guidance is provided as to allowable light levels, as measured 3 degrees above the horizontal, in four zones surrounding the runway and extending out a total distance of 4,500m from the runway threshold. The zones become narrower and shorter the closer to the runway threshold. The maximum allowable lighting intensity in each zone decreases the closer to the runway. The most critical area is the inner zone (Zone A), which extends 1,000m beyond the runway threshold and 300m to each side of the runway centre line.

Potential conflicts or distractions caused by lighting colour are noted as independent from lighting intensity as some colours may cause confusion with airport lighting.

Adverse impacts from ground lighting can often be associated with outdoor advertising displays, sports field lighting and street lighting. At present, no adverse impacts from ground light emissions are known to exist at Camden Airport. Lighting associated with future development in the airport vicinity should conform to the provisions of regulation 94 of the CAR 1988.

To assist developers, lighting designers and installation contractors in the vicinity of airports, CAL has prepared a plan highlighting maximum lighting intensities in areas surrounding Camden Airport. This is presented in Figure 22. External advertising, sports field floodlighting and street lighting are some of the more likely lighting sources requiring consideration. CAL will consult and liaise with Camden Council, and other Councils as appropriate, so that external lighting does not adversely impact on Airport operations.

17.5 Stack & Vent Efflux

CASA has identified the need to assess the potential hazard to aviation where the vertical velocity from gas efflux may cause airframe damage and/or affect the handling characteristics of an aircraft in flight. This is especially critical during periods of high pilot workload or when the aircraft is being manoeuvred at low altitudes. Typically this includes the initial take-off climb or approach to land, when the aircraft is in the vicinity of an aerodrome.

In some cases the high efflux temperature or velocity may cause air disturbance at higher altitudes. If so, CASA also requires an assessment of the potential for the exhaust plume to affect the safe handling of aircraft in other phases of flight.

The draft CASA Advisory Circular AC 139-05(0) provides aerodrome operators with guidance for assessing possible adverse impacts of gas efflux on aircraft operations in the vicinity of the airport. Plumes with a vertical velocity greater than 4.3 meters/second may cause airframe damage to aircraft during critical stages of flight, such as landing with full flaps extended.

Proponents of a facility to be located within 15 kilometres of an aerodrome are to consult the aerodrome operator if that facility includes a combustion source which generates an exhaust plume which has a vertical velocity greater than 4.3 m/s at the OLS.

The Advisory Circular notes that plumes exceeding 4.3 meters/second vertical velocity at the Obstacle Limitation Surface, or 360 feet AGL should be deemed a potential hazard to aircraft and identified as an "obstacle" in accordance with the provisions of Civil Aviation Safety Regulations (CASR) Part 139.

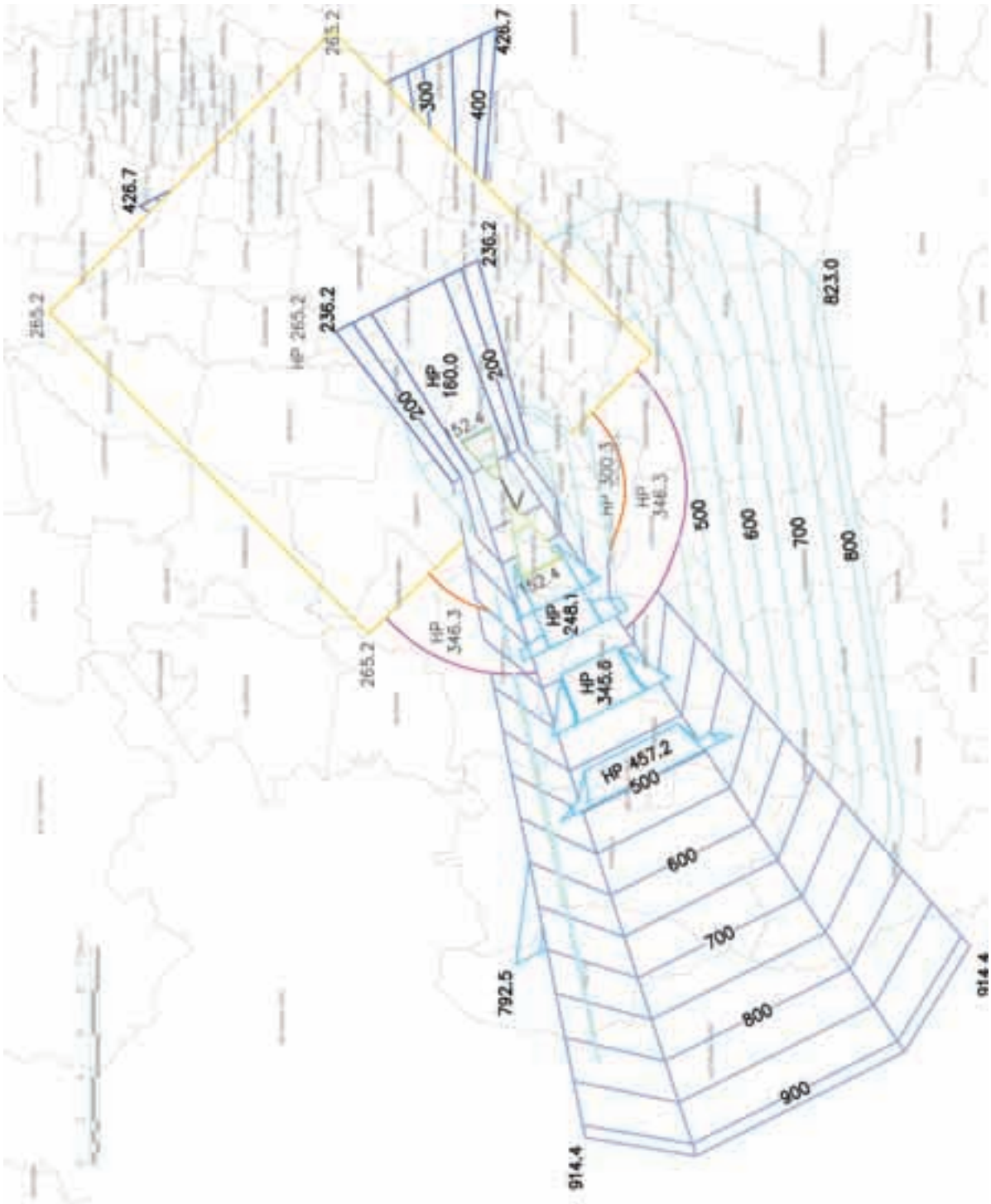
The hazards addressed in the Advisory Circular are typically associated with industrial processes. At Camden Airport, there are no known sources of gas efflux or plumes that would constitute a hazard to aircraft operating at the airport. The Airports Act 1996 also provides for protection of airspace against stack and vent efflux. CAL will consult and liaise with Camden Council, and other Councils as appropriate, on the most appropriate mechanism so that stack and vent efflux does not adversely impact on Airport operations.

> Figure 21

Camden Airport PANS-OPS

LEGEND

- RUNWAY06 GPS MAPP
- RUNWAY 24 GPS MAPP
- RUNWAY 24 GPS MAPP
- RUNWAY 24 GPS
- RUNWAY 24 SID
- RUNWAY 06 SID
- TRANSIT CORRIDOR
- CIRCLING MINIMA CAT A+ B
- CIRCLING MINIMA CAT C



> Airspace Protection

Camden Airport

Master Plan
2004/05

> Figure 22

Camden Airport Maximum Lighting Intensities

LEGEND

ZONE A (OCD)

ZONE B (50CD)

ZONE C (150CD)

ZONE D (450CD)

MAXIMUM INTENSITY OF
LIGHT SOURCES MEASURES
AT 3° ABOVE THE HORIZONTAL