

AVIATION SEARS RESPONSE: TWEED VALLEY HOSPITAL

References:

- A. Airports (Protection of Airspace) Regulations 1996
- B. Gold Coast Airport Master Plan 2017 Chapter 7 Airspace Protection
- C. NSW Health GL2018_010 Guidelines for NSW Hospital HLS

INTRODUCTION

Executive Summary

The siting of a rooftop Helicopter Landing Site (HLS) with its associated approach and departure path design at the Tweed Valley Hospital has resulted in an acceptable outcome. Approach and departure paths accord well with the surrounding community i.e. to the maximum extent overflight of built-up areas is avoided whilst conforming with the most likely wind directions expected in the area.

Primary considerations in selection HLS approach and departure paths included:

- Direction of prevailing winds,
- Location of vertical structures and obstacles/hazards,
- Airspace restrictions and limitations,
- Avoidance of areas sensitive to noise and vibration, and
- Availability of emergency landing areas.

The selected approach and departure paths align north-north-east and south-west. Areas of overflight currently include predominantly farmland and forest. Whilst the HLS is sited just within the Gold Coast Airport (air traffic) Control Zone, it is far enough away from the aerodrome as to constitute no conflict, under normal circumstances, with arriving and departing aircraft. Likewise, protection of prescribed airspace will not be compromised either during the construction phase (crane erection) or in operation.

This document addresses the aviation considerations as they apply to the TVH development. It includes the following:

- SEARS General Requirements:
 - Regulatory Review,
 - Preferred Flight Path Directions,
- SEARs Key Issues.

SEARS GENERAL REQUIREMENTS – REGULATORY REVIEW

The TVH development is located marginally within the Coolangatta (Gold Coast) aerodrome Control Zone (CTR) and is therefore considered to be within “prescribed airspace” as defined in Reference B. The CTR encompasses that airspace from ground level up to 1500 feet (457 metres) above mean sea level out to a distance of seven nautical miles (13 kilometres). Reference C provides an excellent overview of the statutory and regulatory implications for developers in relation to vertical constructions within prescribed airspace. In short, structures up to a height of 500 feet (153 metres) are permitted in the vicinity of Kingscliff/Cudgen as a matter of course without impacting flight safety.

The positioning and proposed vertical development of TVH at 771 Cudgen Road, Cudgen will not incur any negative air traffic or protected airspace factors or considerations (notwithstanding approval must still be sought). It is not expected there would be any constraints imposed by prescribed airspace associated with airports or airport instrument approach and standard departure profiles. As a consequence, the development of the hospital, and in particular vertical obstructions such as cranes, can be addressed from a “safety to flight” requirement for helicopters approaching to, operating from, the TVH helicopter landing site (HLS).

The new TVH is sufficiently distant from Gold Coast Airport such that aircraft arriving and departing from that airport will not realise any traffic conflict with helicopters operating to and from the HLS. Being within controlled airspace, Air Traffic Control would manage any traffic separation requirements.

AirServices Australia

It is envisaged the new facility will not exceed the permitted penetration any of the overlying prescribed airspace. Reference B indicates the requirement to submit the relevant application and associated detailed TVH development and crane drawings to AirServices. In this instance, it is planned that AirServices airspace protection staff will be contacted by email with details of the development. The response is usually available within 6 weeks.

Civil Aviation Safety Authority (CASA)

Engagement with CASA is not a normal part of an application for a development. CASA is normally only informed by AirServices Australia if there is deemed to be a risk to safety for a development.

HLS Compliance and Standards

Currently within Australia, there are no set rules or regulations applicable to the design, construction or placement of HLS'. The appropriate legislation at present for the use of HLS' is Civil Aviation Regulation (CAR) 92 which places the onus on the helicopter pilot to determine the suitability of a landing site.

CASA, as the regulator of aviation in Australia, divested itself of direct responsibility in the early 1990s and currently provides only basic operating guidelines via Civil Aviation Advisory Publication (CAAP) 92-2 (2) Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites.

CASA does not provide design, structural information or advice beyond that provided in the CAAP.

CASA, as a component of a Regulatory Reform Program, does propose to prepare rules for helicopter landing sites and currently has a panel established for this purpose. The new rules will form Civil Aviation Safety Regulation (CASR) Part 139R, however it is not expected that they will be completed any time soon. If and when they are introduced, there will be an implementation phase and “grandfather” clauses. Standards set by NSW Ambulance were established to meet or exceed those requirements.

Considerable work internationally has been undertaken over many years in this area, particularly through the International Civil Aviation Organisation (ICAO) and the US Federal Aviation Administration (FAA). The resulting documents on the subject provide excellent advisory material, guidelines and best practice standards. These are contained in Reference D.

ICAO sets out international Standards and Recommended Practices (SARPS) for the safe conduct of civil aviation activities in the Annexes to the Convention on International Civil Aviation (Chicago, 1944), with the following Annexes applicable to helicopter operations:

- Annex 6: Operation of Aircraft - Part III: International,
- Operations - Helicopters 6th Edition July 2004, and
- Annex 14: Aerodromes - Volume II: Heliports 4th Edition 2013.

ICAO Annex 14 Volume II provides SARPS for the planning, design, operation and maintenance of HLS facilities for use by the providers of these facilities, CAAP 92-2(2) provides only limited guidance material on the minimum physical parameters required to assist helicopter pilots and operators in meeting their obligations under CAR 92.

As a signatory to the Convention on International Civil Aviation, Australia has undertaken to apply the ICAO SARPS, except where specific differences have been notified to ICAO.

The Supplement (Second Edition, Amendment No.1, 18 February 1999) to Annex 14 Volume II, lists seven CASA Australia recommended differences to the ICAO SARPS relating to heliports. This document is now out-of-date and the differences remain. Subject to differences, CASA supported the adoption of Annex 14, SARPS for heliports.

CASA has for some years been undertaking a Regulatory Reform Program in the rotary wing area and it is assumed that the ICAO SARPS with some of the differences removed, will form the basis of the proposed Civil Aviation Safety Regulations.

Proposed new CASRs include:

- Part 133 pertaining to Commercial Air Transport Operations;
- Part 138 pertaining to Aerial Work operations; and
- Part 139R pertaining to Helicopter Landing Sites.

Currently within Australia Helicopter Emergency Medical Services (HEMS) activities are defined as Aerial Work operations however it is proposed by CASA that helicopter aeromedical functions will be redefined as Air Transport operations (Medical Transport under CASR Part 133). Should this eventuate, the highest standards required of Air Transport (the carriage of passengers for hire and reward) will apply to Medical Transport.

Although CASA has not historically been active in the HLS field, many countries have, and in particular the US. Many years of experience operating large numbers of helicopters in a range of roles, have resulted in the production of comprehensive helicopter landing site and heliport design and operating procedures. The US Federal Aviation Administration (FAA) has produced an Advisory Circular, the content of which is actually required in the US, detailing the necessary standards. Within the AC is a comprehensive section devoted to hospital based "helicopter landing sites", and where more than one HLS is co-located, "heliports".

Standards applied to HLS development for NSW Health

The following documents provide excellent advisory material, guidelines and best practice standards and led to the development of the HLS Policy GL2018_010 – Reference D.

Key current documents are as follows:

- ICAO Annex 14, Vol II, Heliports;
- ICAO Heliport Manual Doc 9261-AN/903;

- US FAA Advisory Circular AC 150/5390-2C, Heliport Design, (covers both operational and design criteria, particularly for hospital based HLSs in Chapter 4, Hospital Heliports);
- Australian Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication (CAAP) 92-2 (2) Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites. (covers essentially operational specifications only and is produced around European commercial helicopter airport-based operations); and
- NSW Health GL2018_010 Guidelines for NSW Hospital HLS of April 2018.

The Guidelines GL2018_010 was prepared primarily around the ICAO and FAA guidelines and standards, utilising the most appropriate recommendations and practical HEMS operating procedures. The Guidelines are the standards used by NSW Health and therefore used in this report.

SEARS GENERAL REQUIREMENTS - PREFERRED FLIGHT PATH DIRECTIONS

Image 1 illustrates the planned flight paths to the TVH HLS (large scale).



Image 1: Flight path illustration at TVH HLS

Image 2 illustrates the planned flight paths to the TVH HLS (small scale).

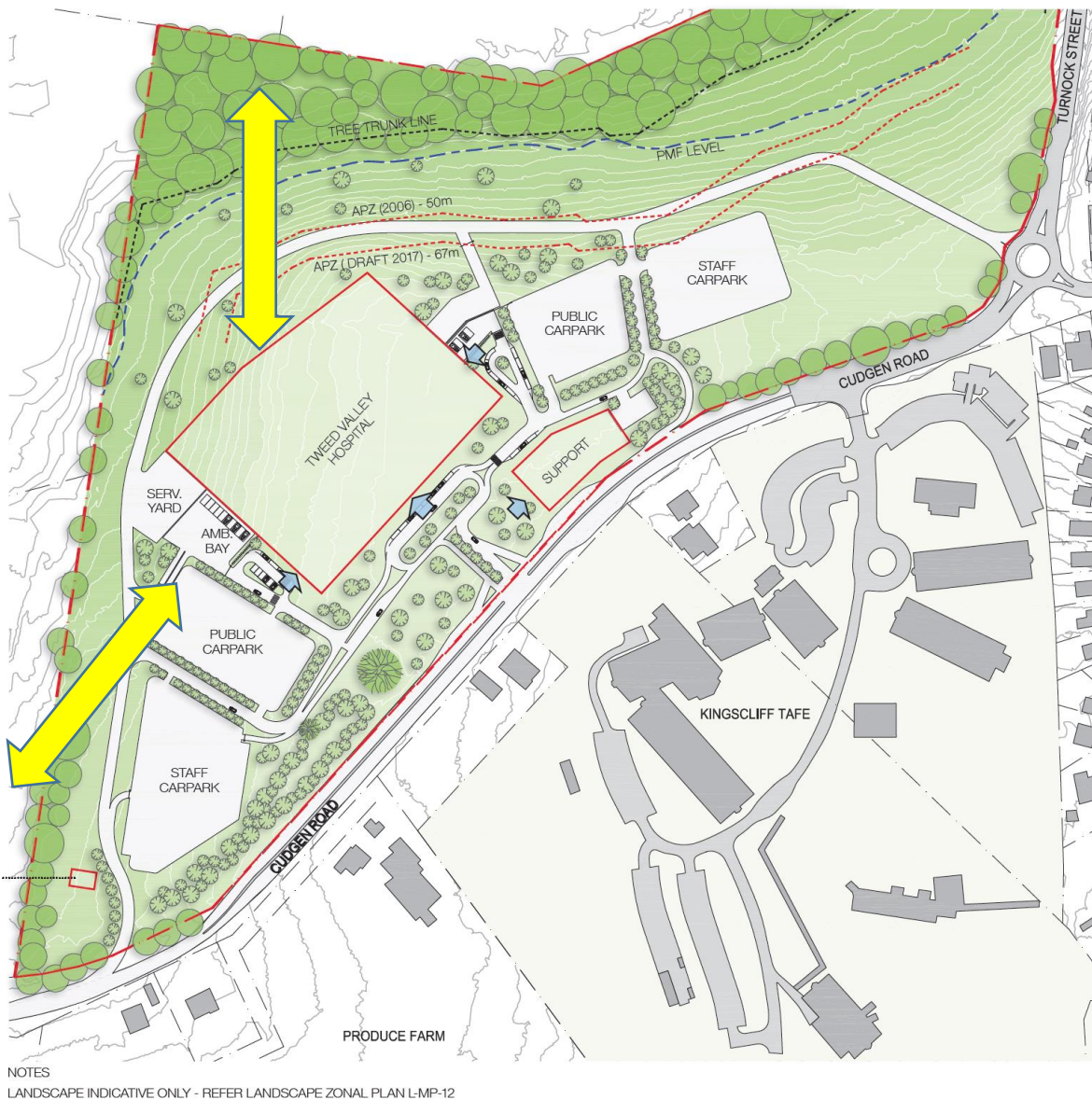


Image 2: Indicative flight path illustration at TVH HLS (small scale)

The proposed visual flight rules approach and departure paths run north-northeast to southwest. It is expected these paths will need to be adjusted and surveyed to achieve an obstacle free gradient of 2.5° (4.5% or 1:22 vertical to horizontal), measured from a point 1.5 m. above the forward edge of a 25 m diameter final approach and take-off area (FATO), to a height of 500 feet above the FATO at a distance of ~3,500 m.

Primary considerations in selection HLS approach and departure paths include:

- Direction of prevailing winds,
- Location of vertical structures and obstacles/hazards,
- Airspace restrictions and limitations,
- Avoidance of areas sensitive to noise and vibration, and

- Availability of emergency landing areas.

Wind

The Gold Coast is not a standard location for which the Bureau of Meteorology collates annualised wind roses. For this reason, wind roses for Brisbane Airport and Coffs Harbour have been used. The data includes average readings from each location at 0900 in the morning and 1500 in the afternoon spread over a period of at least 25 years. The results are very similar which gives a high degree of confidence that the winds most likely to be experienced can be predicted to a high level of certainty. Image 3 below shows the annualised wind roses for 0900 and 1500 at Brisbane Airport. These roses favour approaches and departures (predominantly into wind) in the north-eastern and south-western sectors.

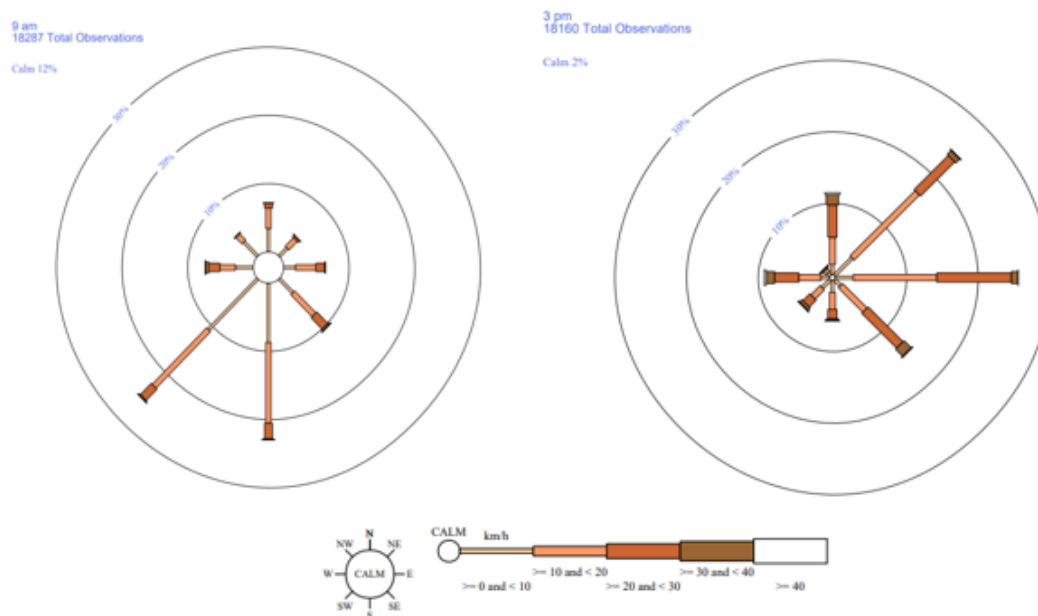


Image 3: Annualised wind roses at 0900 and 1500 for Brisbane Airport

Image 4 below shows the annualised wind roses for 0900 and 1500 at Coffs Harbour. These roses also favour approaches and departures (predominantly into wind) in the north-eastern and south-western sectors.

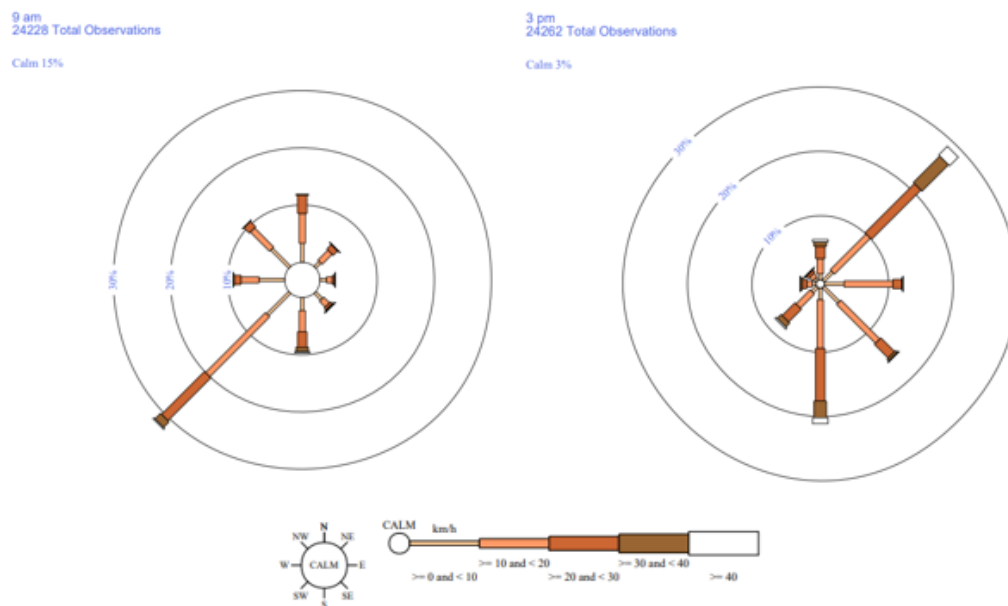


Image 4: Annualised wind roses at 0900 and 1500 for Coffs Harbour

SEARS KEY ISSUES

Key Issue: Statutory and Strategic Context

Permissibility. Permissibility from an aviation perspective needs to be confirmed from AirServices Australia.

Development Standards. The standards applying to this HLS are NSW Health Policy and represent best practice and exceed any standards required by current legislation. Development Standards from an aviation perspective does not apply.

Key Issue: Policies

NSW Health Policy. The HLS will meet the compliance requirements of NSW Health GL2018_010 Guidelines for NSW Hospital HLS.

Key Issue: Environmental Amenity

Acoustic Impacts. There will be acoustic impacts associated with the conduct of helicopter flight operations to/from the proposed rooftop HLS. This will require a degree of engineering to ensure noise is not transferred into the structure.

Key Issue: Noise and Vibration

Noise. The typical helicopter 'noise' event includes the following components:

Helicopter arrival:

- 1-minute approach and land, and
- 2 minutes engine idle.

Helicopter departure:

- 1-minute start-up,
- 1-minute hover and backup, and
- 1-minute departure.

Total elapsed noise event is approximately 6 minutes.

Image 5 below is sourced from Health Building Note 15-10: Hospital Helipads issued by the UK Department of Health. It indicates that an elevated (rooftop) HLS will have a positive effect on noise and vibration to the surrounding environment as compared to an on-grade site.

	Ground-level sites	Raised structures and mounds	Elevated (rooftop) sites
Aircraft and public security			
Freedom from obstructions at ground level			
Freedom from obstructions in the helicopter approach corridors			
Provision of into-wind approaches			
Preventing air turbulence affecting helicopters and patients			
Reducing the impact of noise and downwash			
Preservation of trees and shrubs			
Impact on future building plans			
Minimal building cost			
Minimal running costs		See paragraph 3.11	
Requirement for fire and rescue equipment	None mandated	Possibly required	Required
Requirement for trained manpower available for each landing	None mandated	Possibly fire and rescue	Fire and rescue

Image 5: Comparison of ground level, raised (and mounded) and rooftop sites (note: The NSW Health Policy details fire equipment requirements)

Key Issue: Contamination

The main source of contamination from an HLS is that of fuel product spillage. In the case of TVH HLS, this risk is significantly mitigated by:

- not conducting refuelling operations on the HLS, and
- not conducting maintenance on the HLS.

If there was a fuel leak of any sort from the helicopter, the installation of the fuel/water separator will mitigate the contamination risk.

Key Issue: Drainage

The HLS will have appropriate drainage to ensure standing water is drained from the deck. A slope of up to 2° will ensure water does not pool and the integrity of the anti-slip surface is maintained.

Consultation

During the course of the TVH Program, AviPro has consulted with the following organisations:

- Gold Coast Airport (Manager, Operations and Standards),
- Health Infrastructure through Root Partnerships (Program Management),
- NSW Ambulance Service (the helicopter retrieval capability Director),

- Toll Helicopters (contracted helicopter operator),
- Northern Rivers Helicopter Rescue Service (contracted helicopter operator),
- Queensland Government Air and Life Flight (QLD helicopter operators), and
- AirServices Australia.

Future Consultation

AviPro will continue to engage with the following organisations:

- Gold Coast Airport (Manager, Operations and Standards),
- Health Infrastructure through Root Partnerships (Program Management),
- NSW Ambulance Service (the helicopter retrieval capability Director),
- Toll Helicopters (contracted helicopter operator),
- Northern Rivers Helicopter Rescue Service (contracted helicopter operator),
- Queensland Government Air and Life Flight (QLD helicopter operators), and
- AirServices Australia.

AviPro may also engage with the following additional organisations:

- CASA if regulatory change occurs that materially impacts the program.

Conclusion

The site as selected appears suitable, from an early planning standpoint, for the development of a rooftop HLS. The present remoteness of the site makes the planned approach and departure paths least intrusive on surrounding residential areas.

From a SEARS perspective, in summary:

- The new TVH HLS structure and associated cranes used for construction will not infringe prescribed airspace surfaces limits.
- The HLS will be compliant with Reference D – NSW Health Policy and other Policies as they may apply.
- Planned approach and departure paths avoid built-up areas to the greatest extent possible, whilst conforming with the most likely wind directions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Steve", written over a horizontal line.

Steve Graham

Managing Director

AviPro

Aviation Management and Safety Advisors

Tel: 0401 520048

Email: s.graham@avipro.com.au