Amendments: - Updated Site Plan

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12 September 2019

STATE SIGNIFICANT DEVELOPMENT AVIATION REPORT
TWEED VALLEY HOSPITAL STAGE 2: SSD-10353

References:

A. Minister for Planning and Public Spaces Development Consent: SSD 9575 dated 11 June 2019
B. NSW Planning Secretary's Environmental Assessment Requirements: SSD-10353 Tweed Valley Hospital Stage 2 dated 18 July 2019
C. Airports (Protection of Airspace) Regulations 1996
D. Gold Coast Airport Master Plan 2017 Chapter 7 Airspace Protection
E. NSW Health Policy GL2018_010 Guidelines for NSW Hospital HLS
F. National Airports Safeguarding Framework Guideline H – Protecting Strategically Important Helicopter Landing Sites

INTRODUCTION

General

On the 11 June 2019 the Minister for Planning and Public Spaces granted approval for the Concept Proposal and Stage 1 Early and Enabling Works for the new Tweed Valley Hospital (SSD 9575) located at 771 Cudgen Road, Cudgen (Lot 11 DP1246853). All documents relating to this consent can be found on the major project website of DPIE at https://www.planningportal.nsw.gov.au/major-projects/project/10756.

The Environmental Impact Statement (EIS) has been prepared to assist in the State Significant Development (SSD) Stage 2 Application for the Tweed Valley Hospital which will be assessed under Part 4 Division 4.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This, along with supporting documentation, provides a clear outline of the Stage 2 Application.

The Tweed Valley Hospital Project broadly consists of:

- Construction of a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region);
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

This report deals with the rooftop Helicopter Landing Site (HLS), which is incorporated in Stage 2A.

Purpose

This report addresses the specific aviation requirements of Reference A, Part B of Schedule 2 (Conditions to be satisfied in future Development Applications), in particular the requirements set out in Table 1 as follows:

Item	Requirement(s)
B1	**Relocation Impacts Assessment** The future development application for the detailed design and construction of the New Tweed Valley Hospital and the associated facilities (Stage 2 application), must include the details of: (d) proposed operational parameters of the hospital including the helicopter operations.
B26	**Noise and Vibration** The noise and vibration impact assessment, as required by condition B25 of Schedule 2, must demonstrate that the location and operation of the helipad has been designed to minimise noise impacts on sensitive land uses and the biodiversity on the Site and the surroundings.
B33	**Proposed Helipad Design** The Stage 2 application must include: (a) a report prepared by a suitably qualified and experienced aviation professional demonstrating that the design of the helipad incorporates the relevant details outlined in Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites and other relevant National and International guidelines including the information provided within the Aviation SEARS Response prepared by AviPro dated 28 September 2018; and (b) identify the proposed flightpaths in consultation with relevant stakeholders in accordance with Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites and other relevant National and International guidelines.

Table 1 – Development Consent Conditions (Aviation)

This report also addresses the specific requirements of Reference B, in particular Key Issue 21 which requires a report prepared by a suitably qualified Aviation expert:

- providing details of any flight paths that may be impacted by the proposed development,
- providing details of impact of the proposed development on Aviation and Airspace protection considering the Obstacle Limitation Surface (OLS) for Gold Coast Airport,
- providing the location of the proposed HLS, and
- providing a broad overview of the future HLS operations.

List of Abbreviations and Acronyms

A list of the applicable abbreviations and acronyms used throughout this report is at Table 2 below:

Acronym	Meaning
AC	US FAA Advisory Circular
ADS-B	Automated Dependent Surveillance - Broadcast
AHD	Australian Height Datum
ASA	AirServices Australia
A-SMGCS	Advanced Surface Movement Guidance and Control System
CAAP	Civil Aviation Advisory Publication (Australia)
CASA	Civil Aviation Safety Authority (Australia)
CARs	Civil Aviation Regulations (1988) Australia
CASRs	Civil Aviation Safety Regulations (1998) Australia
CTR	Control Tower Region (Control Zone)
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration, USA
HEMS	Helicopter Emergency Medical Service
HF	High Frequency
HLS	Helicopter Landing Site
HLSRO	HLS Reporting Officer (Airservices requirement)
ICAO	International Civil Aviation Organisation
LLA	Landing and Lift Off Area. Solid surface meeting dynamic loading requirements, with undercarriage contact points + I metre in all directions
OIS	Object Identification Surface (replaces OLS)
OLS	Obstacle Limitation Surfaces (now obsolete)
PANSOPS	Procedures for Air Navigation Services – Aircraft Operations
PRM	Precision Runway Monitoring
RTCC	Radar Terrain Clearance Chart
SARPS	Standards and Recommended Practices developed by ICAO and promulgated in the Annexes to the Convention of International Civil Aviation
SEARS	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
TVH	Tweed Valley Hospital
UHF	Ultra High Frequency
US	United States
VFR	Visual Flight Rules
VHF	Very High Frequency
WAM	Wide Area Multilateration

Table 2 – List of Abbreviations and Acronyms

Overview of the HLS Design Task

The siting of a rooftop Helicopter Landing Site (HLS) with its associated approach and departure path design at the Tweed Valley Hospital (TVH) has resulted in a very workable outcome. Approach and departure paths accord well with the surrounding community and sensitive areas i.e. to the maximum extent overflight of built-up and other sensitive areas is avoided whilst conforming with the most likely wind directions expected in the area and providing the best available forced landing areas pertinent to prevailing wind directions.

Primary considerations in HLS approach and departure path selection included:

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

The selected approach and departure paths, dictated by prevailing winds, obstacle avoidance and availability of suitable forced landing areas for emergencies during late final approach or the early stages of take-off align almost north-south. This varies from earlier planning for the SEARs due to:

- slight relocation and reorientation of the TVH;
- changes to the location of the lift core/overrun; and
- greater separation afforded to a known flying fox camp.

Areas of overflight currently include predominantly farmland and forest. Whilst the HLS is sited just within the Gold Coast Airport (GCA) (air traffic) Control Zone (CTR), it is far enough away from the aerodrome as to constitute no confliction, under normal circumstances, with arriving and departing aircraft. Likewise, protection of prescribed airspace will not be compromised by structures, either during the construction phase (crane erection) or in operation.

This document addresses the aviation considerations as they apply to the TVH Stage 2 development in the following areas:

- SSD General Requirements – Regulatory Review,
- SSD2 General Issues,
- SSD2 Key Issues, and
- Response to Development Consent Conditions (Aviation)

SSD GENERAL REQUIREMENTS – REGULATORY REVIEW

The TVH development is located marginally within the GCA CTR and is therefore considered to be within “prescribed airspace” as defined in Reference C. The GCA 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 D 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 (provided they are appropriately marked/lit as necessary) 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). There are no 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 HLS.

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

AirServices Australia (ASA)

ASA advise in relation to the development that:

- With respect to procedures designed by Airservices in accordance with ICAO PANSOPS and Document 9905, at a maximum height of 67.1m (221ft) AHD, the Property Development will not affect any sector or circling altitude, nor any instrument approach or departure procedure at Gold Coast Airport.
- The property development will not affect any RTCC, and
- This proposal for a property development at the maximum height of 67.1m (221ft) AHD will not adversely impact the performance of any Airservices Precision/Non-Precision Nav Aids, Anemometers, HF/VHF/UHF Comms, A-SMGCS, Radar, PRM, ADS-B, WAM or Satellite/Links.

Civil Aviation Safety Authority (CASA)

CASA has advised that it has reviewed the development application and notes that the concept includes a nine-storey building and a rooftop helipad. CASA agrees that the planning and design considers the following relevant documentation listed in the Avipro SEARs Report:

- International Civil Aviation Organization (ICAO) Annex 14, Vol II, Heliports
- ICAO Heliport Manual Doc 9261 -AN/903
- US Federal Aviation Administration Advisory Circular 50/5390-2C, Heliport Design
- Australian CASA Civil Aviation Advisory Publication (CAAP) 92-2 (2) Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites
- NSW Health GL2018_010 Guidelines for NSW Hospital HLS of April 2018

CASA advises that it has received its own advice that "the building will not infringe the Obstacle Limitation Surfaces for Gold Coast Airport."

HLS Compliance and Standards

Within Australia, there are no laws or regulations applicable to the design, construction or placement of HLS'. The relevant current legislation 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 CASA 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, intends 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) Sub-Part 139R. It is currently anticipated that Sub-Part 139R will become applicable from late March 2021. 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 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 E.

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:

- Sub-Part 133 pertaining to Commercial Air Transport Operations;
- Sub-Part 138 pertaining to Aerial Work operations; and
- Sub-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 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 E.

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); and
- Australian CASA 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).

The Guidelines GL2018_010 document was prepared primarily around the ICAO and FAA publications, utilising the most appropriate recommendations and practical HEMS operating procedures. The ICAO and FAA publications supplement and exceed the requirements of the CASA publication and in no way countermand it. The Guidelines are the standards used by NSW Health and are therefore used in this report.

SSD2 GENERAL ISSUES

General Issue: Statutory and Strategic Context

Permissibility. Permissibility from an aviation perspective has been confirmed by ASA.

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.

General Issue: Policies

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

General 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 1 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 1: Comparison of ground level, raised (and mounded) and rooftop sites
(note: The NSW Health Policy details fire equipment requirements)

General Issue: Management of Cranage during construction

It is important however that cranes do not infringe the Obstacle Identification Surfaces (IOS) associated with GCA. This requirement will be addressed prior to construction activities commencing. The requirements of Reference F are applicable in this regard.

General Issue: Contamination

The main 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 or maintenance on the HLS. If there was a fuel leak from any sort from the helicopter, the installation of the fuel/water separator will mitigate the contamination risk.

SSD2 KEY ISSUES

Airspace - General

The TVH is positioned at the red star in Image 2 below. The current Tweed Hospital is positioned at the green star. TVH will be on the very edge of the CTR for the GCA. The area to the south of TVH is already an area that experiences regular air traffic as aircraft transit to and from the coast to link up with the Visual Flight Rules (VFR) route (purple dotted line) to the west of the GCA; and to conduct flying training in the airspace to the south of the Control Zone. Other traffic will be approaching to land at the airport from the south. Commercial aircraft arriving at the GCA from the south will be above 2000 feet in altitude at the time of passing overhead TVH. Any HEMS helicopter in the vicinity will usually be well below 1000 feet in altitude and in any case will be under the control of the GCA Tower Controller during Tower operating hours (0600-2300 daily).

Aircraft departing to the south will be in excess of 2000 feet in altitude if they maintain runway heading, therefore in all instances helicopter traffic into and out of TVH will present no conflictions with routine air traffic operating in GCA's airspace, and in any case will usually be under positive control during Tower operating hours. See also ASA's advice in the section SSD General Requirements – Regulatory Review.

Image 2: Location of TVH Relative to Gold Coast Airport airspace

Airspace – Protection of Prescribed Airspace

CASA has advised that **"**the building will not infringe the Obstacle Limitation Surfaces for Gold Coast Airport." Obstacle Limitation Surfaces are now known as Object Identification Surfaces.

Location and Operation of the HLS

Image 3 illustrates the planned flight paths to the TVH HLS (large scale). This image attempts to portray that it is the low-speed early part of the departure and the low-speed final approach that requires stability in direction (hence the approach and departure arrows painted onto the HLS and depicted on this image). The arrows do not imply that the helicopter will continue in this direction for any length of time. On approach, the pilot can use a curving path to turn "inside" noise sensitive and environmentally sensitive areas and on departure, once safe to do say, the pilot can manoeuvre to avoid them again. See also response to Development Consent Condition B1.d. later in this report.

Image 3: Flight path illustration at TVH HLS

Aircraft arriving and departing from TVH will require an ATC clearance. ATC will separate HEMS helicopters from civil commercial air traffic. Depending on ATC requirements, HEMS helicopters arriving and departing to/from the north (the top/northern yellow arrow) will typically avoid overflight of populous areas where possible. It will not always be possible to avoid overflight of the housing estate to the north of the hospital. HEMS helicopters arriving and departing to/from the south will arrive on their own pre-determined flight path or as directed by ATC and will depart in accordance with ATC instructions. Depending on their point of origin (arrivals) or destination (departures), ATC will attempt to accommodate any specific pilot requests to avoid sensitive areas.

Image 4 illustrates the planned flight paths to the TVH HLS (small scale).

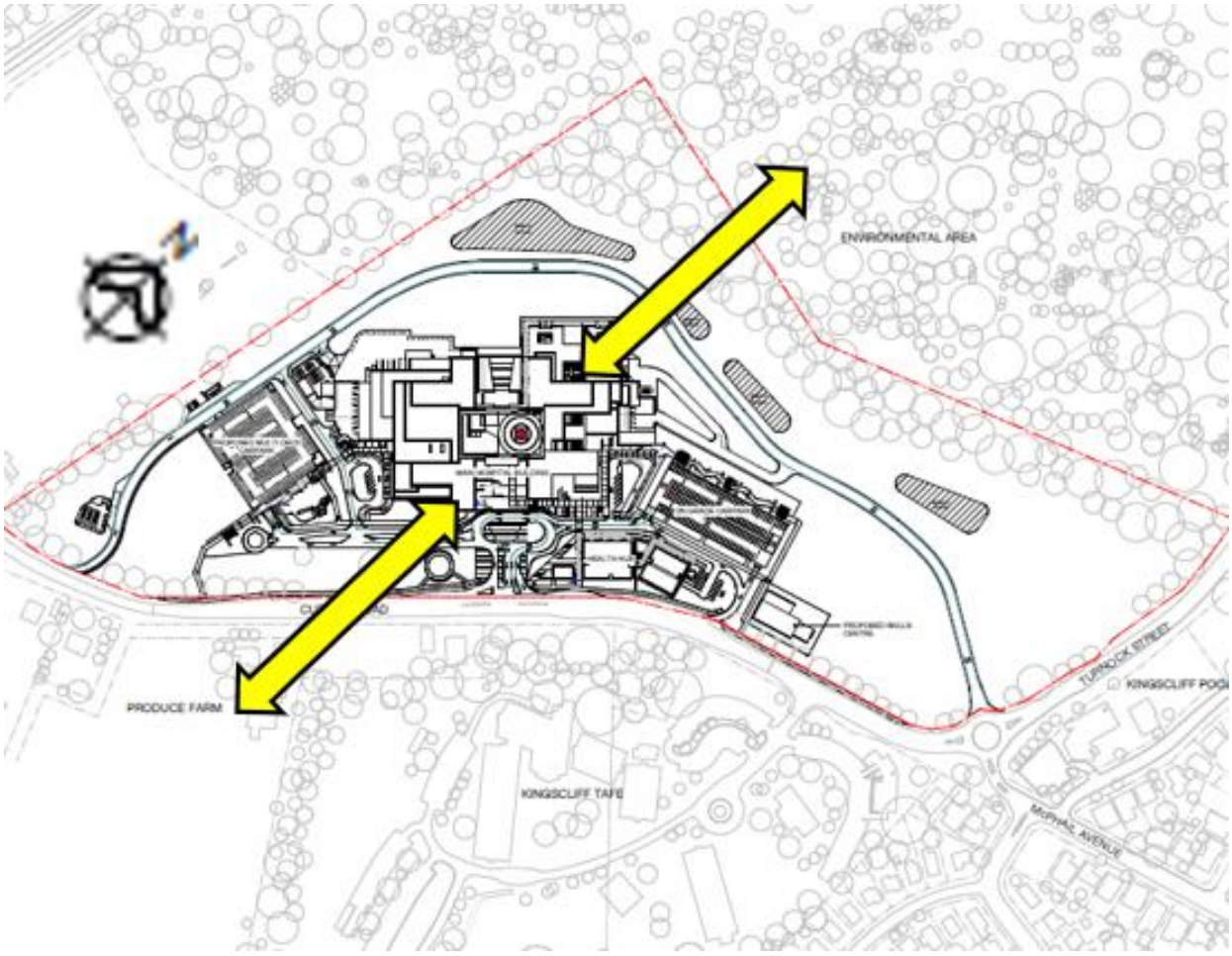


Image 4: Flight path illustration at TVH HLS

The proposed Visual Flight Rules (VFR) approach and departure paths run North – South (N-S). These paths will need to be 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 of HLS approach and departure paths include:

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

Of particular note, the arrival and departure paths avoid the Kingscliff TAFE. It will not be possible to avoid some noise impact on the farm houses immediately to the south of the hospital when HEMS helicopters are operating to or from that direction.

Wind

The Bureau of Meteorology has a weather station at GCA, 13 km from the hospital site.
The readings show that average annual predominant winds in the area are from the south in the morning and swing around to the north to northeast (sea breeze) in the afternoon. Refer to Images 5 and 6. This information is relevant during planning to account for any obstructions along the paths.

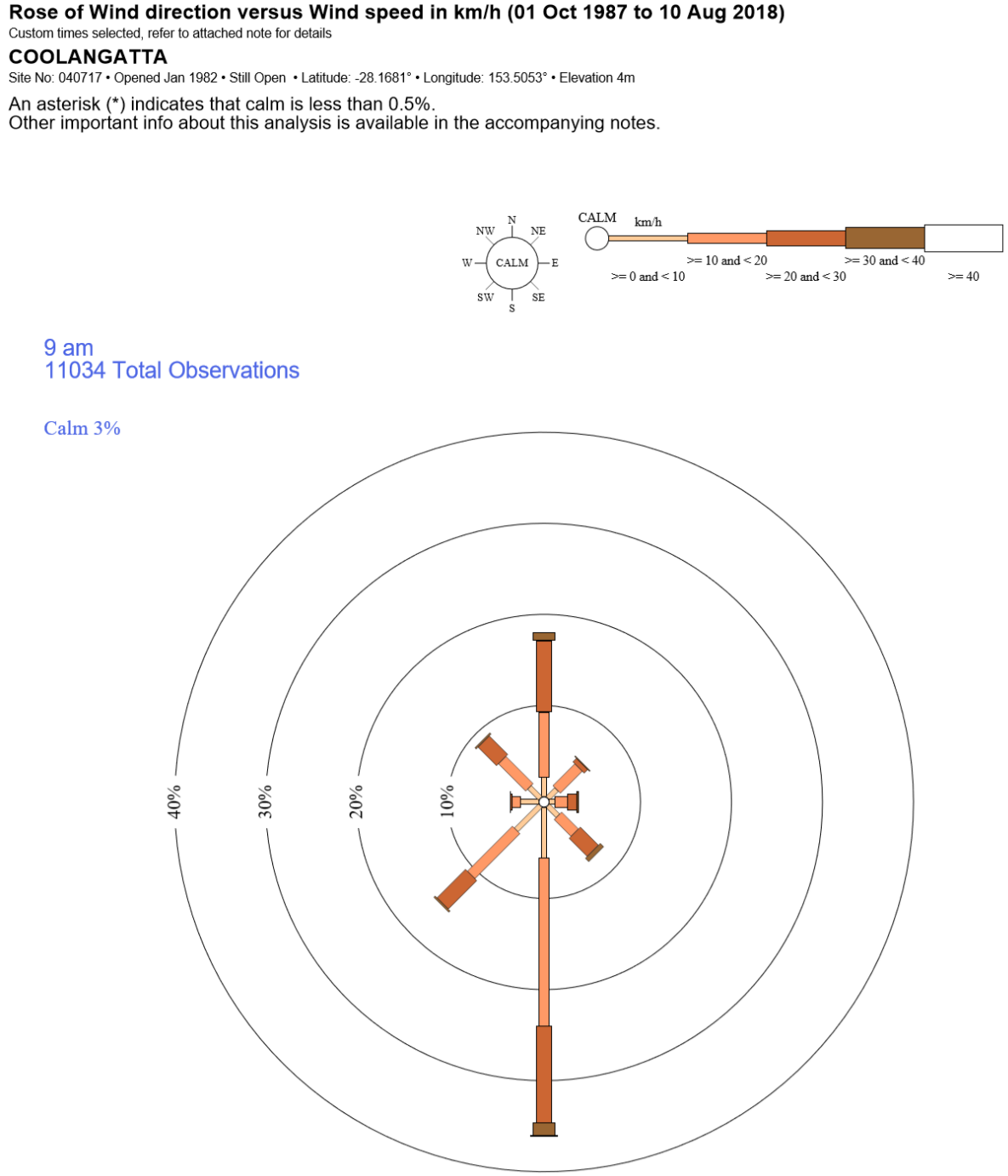
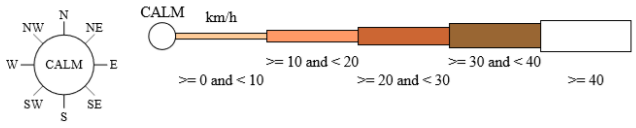


Image 5: GCA AWS 0900 Wind Rose – Annual Average

Rose of Wind direction versus Wind speed in km/h (01 Oct 1987 to 10 Aug 2018)
Custom times selected, refer to attached note for details

COOLANGATTA
Site No: 040717 • Opened Jan 1982 • Still Open • Latitude: -28.1681° • Longitude: 153.5053° • Elevation 4m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
11060 Total Observations

Calm *

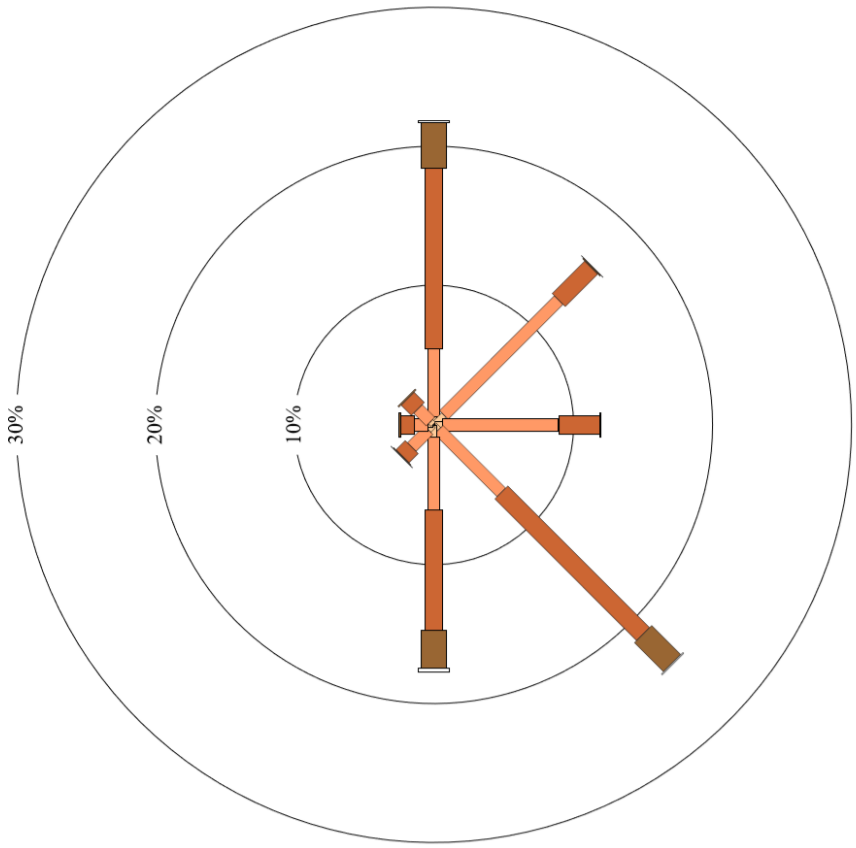


Image 6: GCA AWS 1500 Wind Rose – Annual Average

Important criteria for approach/departure paths is that there be a minimum of two that are at least 150° apart. In this scenario, the two main paths are 180° apart, which is the ideal. The AW 139 helicopters can accommodate quite strong quartering tail winds and therefore there would be few if any occasions when wind direction alone would lead to the HLS being unusable. The preference however, is to have some component of head wind when landing or departing. Excessively strong or very gusty wind conditions on the other hand may cause a temporary closure regardless of direction.

The two paths should allow for acceptable head wind components at almost all times. The elevated HLS positioning on the rooftop provides for additional approach/departure paths whereby the pilot can land or take-off into wind from most directions where infrastructure permits. Prior to acceptance by NSW Ambulance, a VFR approach and Departure Path and Transitional Surface survey combined with a Design Development Overlay survey will need to be completed.

RESPONSE TO DEVELOPMENT CONSENT CONDITIONS – AVIATION

B1 Relocation Impacts Assessment

Condition: The future development application for the detailed design and construction of the New Tweed Valley Hospital and the associated facilities (Stage 2 application), must include the details of:

(d) proposed operational parameters of the hospital including the helicopter operations.

Response: NSW Ambulance has assessed that helicopter movements associated with the Tweed Valley Hospital would be less than ten a month, with a typical expected average of six. Most transfers will be outbound, usually planned and during daylight working hours. Most non-serious cases will arrive by road but occasional non-serious inbound patients can be expected to arrive by helicopter where there is great urgency e.g. imminent birth. A Helicopter Operations Manual specifically for TVH will be developed as part of the HLS commissioning process. It will be developed in conjunction with expert clinical and security/HLS management staff to document the processes and practices that will be applied to the reception and preparation for departure of HEMS helicopters. HEMS helicopters will predominantly arrive and depart in accordance with the designed approach and departure paths which at present are planned to be aligned North-South (N-S). The primary determinant in good HLS design must always focus on safety – to the helicopter crew, to hospital occupants and to the surrounding community. The drivers for such design factors are airspace considerations, prevailing winds, the presence of obstacles including those on the hospital structure and the availability of suitable forced landing areas. In the case of TVH, the preferred (safest) N-S approach and departure directions accord very well with avoidance of sensitive areas and the one known area of significant biodiversity interest (flying fox camp). Orientation towards NW-SE would incur more direct overflight of the Kingscliff TAFE and Kingscliff High School campuses. Orientation towards NE-SW would result in flight closer to the flying fox camp. Orientation East – West (E-W) would result in overflight of the Cudgen enclave and the western part of Kingscliff including the Kingscliff High School. On exceptional occasions, HEMS helicopters will arrive and depart on alignments other than the N-S alignment but this will be for operational (safety) reasons such as excessively strong winds that do not fit with the published approach and departure directions. While, or once, an aircraft has safe single-engine flying speed the pilot is at liberty to manoeuvre and turn (even up to 180°) to suit the prevailing wind conditions or to comply with any relevant “fly neighbourly” procedures; or to avoid known areas sensitive to aircraft noise and vibration. Increasing rates of climb and descent (increasing flight path steepness) can be utilised to attempt to insulate sensitive areas from noise and vibration. In reality, no two approaches or departures will ever be alike. The inherent flexibility of a helicopter allows it to accommodate various flight profile changes in response to changing circumstances and requirements. Nearer to HLS commissioning, helicopter operators will be apprised of the exact location of the flying fox camp and procedures will be developed in consultation to provide maximum clearance on each occasion a HEMS helicopter approaches or departs the hospital. The location of the sensitive areas may be advised to ASA for possible inclusion in relevant publications.

B26 Noise and Vibration

Condition: The noise and vibration impact assessment, as required by condition B25 of Schedule 2, must demonstrate that the location and operation of the helipad has been designed to minimise noise impacts on sensitive land uses and the biodiversity on the Site and the surroundings.

Response: To the best of the HLS designer's ability, the impact on receivers such as communities, residential buildings and schools has been minimised.

B33 Proposed Helipad Design

Condition: The Stage 2 application must include:

(a) a report prepared by a suitably qualified and experienced aviation professional demonstrating that the design of the helipad incorporates the relevant details outlined in Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites and other relevant National and International guidelines including the information provided within the Aviation SEARS Response prepared by AviPro dated 28 September 2018; and

(b) identify the proposed flightpaths in consultation with relevant stakeholders in accordance with Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites and other relevant National and International guidelines.

Response: This report has been developed by AviPro, a long-standing qualified, professional aviation organisation experienced in the design of Hospital HLS' for the NSW Government, as well as other Australian State and Territory Governments. This report encompasses all of the key requirements of CASA CAAP 92-2(2) as they are incorporated into Reference E. The proposed approach and departure paths (flightpaths) have been designed in acknowledgement of the input of relevant stakeholders – CASA, ASA, GCA (as received during the request for SEARS) and incorporating feedback on known noise sensitive areas and a location of significant biodiversity concern.

CONSULTATION

Past Consultation

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

- Gold Coast Airport (Manager, Operations and Standards),
- Health Infrastructure,
- 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),
- AirServices Australia,
- Acoustic Studio (Noise and Vibration),
- Greencap (Biodiversity),
- SGS Economics and Planning Pty Ltd (Social and Economic Impact Assessment), and
- JHA (Noise and Vibration).

Future Consultation

AviPro will continue to engage with the following organisations as appropriate:

- Gold Coast Airport (Manager, Operations and Standards),
- Health Infrastructure (Program Management),
- NSW Ambulance Service (the helicopter retrieval capability Director),
- Toll Helicopters (contracted helicopter operator),
- Northern Region 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 is suitable for the development of a rooftop HLS, notwithstanding reorientation and relocation of the building within the site and repositioning of the lift core/overrun from SSD1 to SSD2. These changes have necessitated changes to the approach and departure paths design but this has not resulted in any negative ramifications. The present remoteness of the site makes the planned approach and departure paths least intrusive on surrounding noise-sensitive areas.

From an SSD2 perspective, in summary:

- This report incorporates all of the necessary HLS design guidelines required by the NSW Government and the HLS, including the designed approach and departure paths, will be compliant with Reference E (and therefore by default compliant with CASA CAAP 92-2(2)).
- Noise and vibration impact on sensitive land uses has been minimised to the maximum extent that safety allows.
- Approach and departure path alignment has minimised the impact on the biodiversity on the Site to the maximum extent that safety allows, and in particular the potential for helicopter collision with grey-headed flying foxes has been minimised to the maximum extent that safety allows.
- No aviation approach and departure paths into and out of GCA will be impacted.
- No Object Identification Surfaces (formerly Obstacle Limitation Surfaces) for GCA will be penetrated.
- Planned approach and departure paths avoid built-up and sensitive areas to the greatest extent possible, whilst conforming with the most likely wind directions and providing pilots with the best available forced landing areas in the event of emergencies requiring immediate landing when on final approach to land or immediately after take-off.

Sincerely,

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