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SHOALHAVEN DISTRICT MEMORIAL HOSPITAL REDEVELOPMENT PROJECT STATE SIGNIFICANT DEVELOPMENT (SSD) REPORT (AVIATION IMPACT STATEMENT)

5 May 2022

ROOFTOP HELICOPTER LANDING SITE

Prepared for

NSW Health Infrastructure

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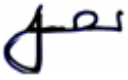
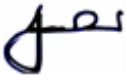
		Signature			
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This Report is prepared for NSW Health Infrastructure for the Shoalhaven District Memorial Hospital project by Resolution Response Pty. Ltd. ABN: 94 154 052 883, trading as ‘AviPro’.

The Report relates to the aviation aspects associated with the establishment and site design of the proposed hospital rooftop HLS to inform consideration a State Significant Development Application.

Contents

1. DESCRIPTION OF THE PROPOSAL

1.1. Overview

Health Infrastructure NSW (HI) is the applicant for the proposed Shoalhaven Hospital Redevelopment (SHR) at Scenic Drive, Nowra in the City of Shoalhaven Local Government Area (LGA).

The proposal is State Significant Development (SSD) for the purposes of the Environmental Planning and Assessment Act 1979 (EP&A Act) and section 14(a) of Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) as it involves development for the purposes of a hospital with a capital investment value in excess of $30 million.

The SHR seeks to deliver significantly enhanced acute services, as well as a new campus main entry and drop-off area.

The proposed Acute Services Building will be located south and east of the hospital's existing cluster of buildings at will address Shoalhaven Street to the hospital's east. The development is proposed to be located on the site of the existing Shoalhaven Community Pre-school (which will be separately relocated) and part of the former Nowra Park (Reserve).

The proposed SHR under this SSD relates primarily to the development of a new hospital building and its ancillary works. The scope includes a new 7-level building of about 31,000m2 Gross Floor Area (GFA), with rooftop plant and Helicopter Landing Site (HLS), generally accommodating the following:

Level 00	Back of House (BOH), Loading Dock, Kitchen, Pharmacy, Staff amenities, Mortuary, and plant.
Level 01	Front of House (FOH), Emergency Department (ED), Medical Imaging, and Cafe
Level 02	Operating Suites & Endoscopy, Central Sterile Supply Department (CSSD), and linkway to Block B
Level 03	Coronary Care Unit (CCU), Close Observation Unit (COU), Intensive Care Unit (ICU), cultural centre, and plant
Level 04	In-Patient Unit (IPU), Mental Health, and plant
Level 05	In-Patient Unit (IPU)
Level 06	In-Patient Unit (IPU)
Level 07	Rooftop plant
Level 08	Helicopter Landing Site (HLS)

Table 1: Shoalhaven Hospital Redevelopment Scope

This generally results in 279 new beds and treatment spaces across a range of departments, eight new operating theatres, and two new endoscopy theatres. The works include a new ambulance entry from Shoalhaven Street, new public and servicing accessway off North Street, and separate loading dock entry and mortuary parking off Shoalhaven Street.

A range of infrastructure and civil engineering works are proposed as well as demolition of existing structures within the footprint of the new building and/or on the existing hospital campus where a new linkway connection is proposed. Earthworks will be necessitated within the building's footprint and immediate environs.

Subdivision of the balance of Lot 104 (the former Nowra Park) remaining and consolidation of the existing pre-school lot into the hospital lot is also proposed.

A number of selected trees will require removal. Other significant trees will be retained and protected. Replacement planting at a minimum rate of 1:1 is proposed.

The development's SEARs were issued by the Department of Planning and Environment on 23 February 2022.

1.2. SEARs Reporting

In preparing this report, the following SEARs General Requirements and Key Issues have been addressed. The table below sets out the reference or location of these matters within this report.

Item	SEARS Requirement	Relevant Section of Report
24.1	*If the development proposes a helicopter landing site (HLS), assess its potential impacts on the flight paths of any nearby airport, airfield, or HLS.*	*See Section 4.3*
24.2	*If the site contains or is adjacent to an HLS, assess the impacts of the development on that HLS.*	*Not applicable See Section 4.9*

Table 2: Secretary's Environmental Assessment Requirements - Aviation

1.3. Construction of a Helicopter Landing Site

This SSDA contains a proposal for a rooftop HLS on the western portion of the SHR with approach and departure paths to the North-West and South-East to accord with the most common annual, average prevailing winds. This alignment also facilitates approaches and departures using the river corridor where wind conditions permit. The new rooftop HLS will replace the existing HLS in Nowra Park (Reserve).

2. TERMS AND ABBREVIATIONS

2.1. Explanation of Terms

Aircraft. Refers to both aeroplanes (fixed wing) and helicopters (rotorcraft).

Approach and Departure Path (IFR). The flight track helicopters follow when landing at or departing from the FATO of an HLS under the Instrument Flight Rules. The IFR approach and departure path extends upwards and outwards from the edge of the FATO safety area with an obstacle free gradient of 2.6^0/4.5%/ 1:22.2 (22.2 units horizontal in 1 unit vertical), to a height of 152m above the FATO at a distance of ~3,386 m. The approach and departure path commences at the forward edge of the FATO safety area at a width of 34m, and increases in width uniformly to 152m m above the elevation of FATO surface at a distance of ~3,386 m.

Approach and Departure Path (VFR). The flight track helicopters follow when landing at or departing from the FATO of an HLS under the Visual Flight Rules. Updated standards to align with ICAO requirements now has the VFR (day and) night approach and departure path extending upwards and outwards from the forward edge of the FATO safety area with an obstacle free gradient of 2.6^0/4.5%/ 1:22.2 (22.2 units horizontal in 1 unit vertical), to a height of 152m above the FATO at a distance of ~3,386 m. The approach and departure path commences at the forward edge of the FATO safety area at a width of 34m, and expands uniformly, laterally at an angle of 8.7^0/15%/1:12.8 to a total width of 140 m, then remains parallel to a distance of ~3,386m, where the height is 152 m above the elevation of FATO surface. The path may be curved left or right to avoid obstacles or to take advantage of a better approach or departure path. Changes in direction by day below 300 feet should be avoided and there should be no changes in direction below 500 feet at night.

Design Helicopter. The Agusta AW139 contracted to the NSW Ambulance. The type reflects the new generation Performance Class 1 capable helicopters used in HEMS and reflects the maximum weight and maximum contact load/minimum contact area. The design helicopter has a maximum all up mass of 7 tonnes, however for HLS design purposes it is assumed the helicopter will never exceed 6.8 tonnes on the HLS.

D Value (Overall Length). The distance from the tip of the main rotor tip plane path to the tip of the tail rotor tip plane path or the fin if further aft, of the Design Helicopter.

Elevated Helicopter Landing Site. An HLS located on a roof top or some other elevated structure where the Ground Effect Area/Touchdown and Lift-off Area (TLOF) is at least 2.5m above ground level.

Final Approach. The reduction of height and airspeed to arrive over a predetermined point above the FATO of an HLS.

Final Approach and Takeoff Area (FATO). A defined area over which the final phase of the approach to a hover, or a landing is completed and from which the takeoff is initiated. For the purposes of these guidelines, the specification of 1.5 x D Value or Overall Length of the Design Helicopter is used and equates to 25m. diameter. Area to be load bearing.

Ground Taxi. The surface movement of a wheeled helicopter under its own power with wheels touching the ground.

Hazard to Air Navigation. Any object having a substantial adverse effect upon the safe and efficient use of the navigable airspace by aircraft, upon the operation of air navigation facilities, or upon existing or planned airport/heliport capacity.

Helicopter Landing Site (HLS). One or more may also be known as a **Heliport**. The area of land, water or a structure used or intended to be used for the landing and takeoff of helicopters, together with appurtenant buildings and facilities.

Helicopter Landing Site Elevation. At an HLS without a precision approach, the HLS elevation is the highest point of the FATO expressed as the distance above mean sea level.

Helicopter Landing Site PC1 Survey Reference Point. A position at the forward edge of the FATO safety area in the centre of the approach and departure path, from which the PC1 survey at 2.6º (4.5%) is initiated.

Helicopter Landing Site Reference Point (HRP). The geographic position of the HLS expressed as the latitude and longitude at the centre of the FATO.

Hospital Helicopter Landing Site. HLS limited to serving helicopters engaged in air ambulance, or other hospital related functions.

Note:

*A designated HLS located at a hospital or medical facility is an emergency services HLS and **not** a medical emergency site.*

Heliport. Two or more co-existing helicopter landing sites (HLS). There are no implications for operating a heliport as opposed to an HLS, other than having a "Heliport Operations Manual" rather than an "HLS Operations Manual" which would address the various interactions and interoperability (aviation, clinical etc) at the dual sites.

Hover Taxi. The movement of a helicopter above the surface, generally at a wheel/skid height of approximately one metre. For facility design purposes, a skid-equipped helicopter is assumed to hover-taxi.

Landing and Lift Off Area (LLA). A load-bearing, nominally paved area, normally located in the centre of the TLOF, on which helicopters land and lift off. Minimum dimensions are based upon a 1 x metre clearance around the undercarriage contact points of the Design Helicopter.

Lift Off. To raise the helicopter into the air.

Movement. A landing or a lift off of a helicopter.

Object Identification Surface. The OIS are a set of imaginary surfaces associated with a heliport. They define the volume of airspace that should ideally be kept free from obstacles in order to minimise the danger to a helicopter during an entirely visual approach.

Obstacle Limitation Surface. The OLS are a set of imaginary surfaces associated with an aerodrome. They define the volume of airspace that should ideally be kept free from obstacles in order to minimise the danger to aircraft during an entirely visual approach.

Obstruction to Air Navigation. Any fixed or mobile object, including a parked helicopter, which impinges the approach/departure surface or the transitional surfaces.

Parking Pad. The paved centre portion of a parking position, normally adjacent to an HLS.

Performance Class 1 (PC1). Similar to Category A requirements. For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit, performance is available to enable the rotorcraft to land within the rejected take-off distance available, or safely continue the flight to an appropriate landing area, depending on when the failure occurs. For an elevated HLS, the reject area is that area within the FATO (25 m. diameter) and therefore this area is to be load bearing. PC1 also requires CASA approved flight path surveys to/from the HLS.

Performance Class 2 (PC2). For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit, performance is available to enable the rotorcraft to safety continue the flight, except when the failure occurs early during the take-off manoeuvres, in which case a forced landing may be required. PC2 also requires CASA approved flight path surveys to/from the HLS.

Performance Class 2 With Exposure (PC2WE). PC2WE is very similar to PC2 as mentioned above. The primary difference is that there need not be any provision for a suitable forced landing area during the take-off and landing phases of flight, within the designated exposure period for the rotorcraft. PC2WE offers operators alternative mitigation strategies based on: a defined exposure time limit, demonstrated engine reliability, engine maintenance standards, pilot procedures and training, and operator risk assessments. Specific approval to operate with exposure is required from CASA and will require a number of mitigation strategies from the operator to gain that approval.

Performance Class 3 (PC3). For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit at any time during the flight, a forced landing:

- in the case of multi-engine rotorcraft – may be required; or
- in the case of single-engine rotorcraft – will be required.

Pilot Activated Lighting (PAL). A PAL system utilises a hospital-based VHF radio and timed switching device, activated by the pilot via a radio transmission on a pre-set frequency, to turn on the associated HLS lighting.

Prior Permission Required (PPR) HLS. An HLS developed for exclusive use of the owner and persons authorized by the owner, i.e. a hospital-based emergency services HLS.

Note:

The HLS owner and the HEMS operator are to ensure that all pilots are thoroughly knowledgeable with the HLS (including such features as approach/departure path characteristics, preferred heading, facility limitations, lighting, obstacles in the area, size of the facility, etc.). This is addressed as part of the HLS commissioning process.

Rotor Downwash. The volume of air moved downward by the action of the rotating main rotor blades. When this air strikes the ground or some other surface, it causes a turbulent outflow of air from beneath the helicopter.

Safety Area. A defined area on an HLS surrounding the FATO intended to reduce the risk of damage to helicopters accidentally diverging from the FATO. This area should be free of objects, other than those frangible mounted objects required for air navigation purposes. The Safety Area for the Design Helicopter extends 4.5 m. beyond the FATO perimeter forming a 34 m. X 34 m. square or a 34m. diameter circle.

Safety Net. Surrounds the outer edge of a rooftop HLS. It is to be a minimum of 1.5 m. wide and have a load carrying capacity of not less than 122 kg/m^2. The outer edge is not to project above the HLS deck, and slope back and down to the deck edge at approximately 10 degrees, and not more than 20 degrees. Both the inside and outside edges of the safety net are to be secured to a solid structure.

Shielded Obstruction. A proposed or existing obstruction that does **not** need to be marked or lit due to its close proximity to another obstruction whose highest point is at the same or higher elevation.

Standard HLS. A place that may be used as an aerodrome for helicopter operations by day and night.

Take off. To accelerate and commence climb at the relevant climb speed.

Take off Position. A load bearing, generally paved area, normally located on the centreline and at the edge of the TLOF, from which the helicopter takes off. Typically, there are two such positions at the edge of the TLOF, one for each of two takeoff or arrival directions.

Touchdown and Lift-off Area (TLOF). A load bearing, generally paved area, normally centred in the FATO, on which the helicopter lands or takes off, and that provides ground effect for a helicopter rotor system. Size is based on 1 x main rotor diameter of Design Helicopter, and is 14m diameter.

Transitional Surfaces. Starts from the side edges of the FATO safety area parallel to the approach and departure path centre line, and extends upwards and outwards (to the sides) at a slope of 2:1 (two-units horizontal in one-unit vertical or 26.6°) to a height of 45m above the elevation of the FATO surface. Further, from the forward edge of the side transitional surfaces, the transitional surface joins the outer edges of the approach and departure surface, and proceeds upwards and outwards until the outer edges are 152m wide at ~3386m which corresponds with the end of the approach and departure surface.

Unshielded Obstruction. A proposed or existing obstruction that may need to be marked or lit since it is **not** in close proximity to another marked and lit obstruction whose highest point is at the same or higher elevation.

2.2. Applicable Abbreviations

Acronym	Meaning
AC	Advisory Circular (US FAA)
ACC	Aeromedical Control Centre (HQ Eveleigh). Responsible for control and tasking of HEMS
ACMA	Australian Communication and Media Authority
ADF	Australian Defence Force
ADS-B	Automated Dependent Surveillance - Broadcast
AsA	Airservices Australia
ASB	Acute Services Building
A-SMGCS	Advanced Surface Movement Guidance & Control System
ATC	Air Traffic Control
CAAP	Civil Aviation Advisory Publication (Australia)
CASA	Civil Aviation Safety Authority (Australia)
CAOs	Civil Aviation Orders (Australia)
CARs	Civil Aviation Regulations (1988) Australia
CASRs	Civil Aviation Safety Regulations (1998) Australia
CTAF	Common Traffic Advisory Frequency
D	Helicopter D value - (also referred to as Overall Length) - the total distance between the main rotor and tail rotor tip path planes when rotating
DA	Development Application
DDO	Design and Development Overlay
DIFFS	Deck Integrated Fire Fighting System
DPIE	Department of Planning, Industry and Environment (NSW)
FAA	Federal Aviation Administration, USA
FATO	Final Approach and Take-Off Area (1.5 x helicopter length)
FARA	Final Approach Reference Area
FMS	Fixed Monitor System (foam fire-fighting system)
GPS	Global Positioning System
HEMS	Helicopter Emergency Medical Service
HF	High Frequency
HI	Health Infrastructure

Acronym	Meaning
HLS	Helicopter Landing Site
HLSRO	HLS Reporting Officer (Airservices Australia requirement)
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions – requiring IFR flight
ISLHD	Illawarra-Shoalhaven Local Health District
L	Helicopter fuselage length
LDP	Landing Decision Point (Category A/Performance Class 1 operations)
LGA	Local Government Area
LHD	Local Health District
LLA	Landing and Lift Off Area. Solid surface meeting dynamic loading requirements, with undercarriage contact points + I metre in all directions
MoH	Ministry of Health NSW
MOS	Manual of Standards (CASA)
MRI	Magnetic Resonance Imagers
MTOM	Maximum Take Off Mass
MTOW	Maximum Take Off Weight
NOTAM	Notice to Airmen. Issued by Airservices Australia in relation to airspace and navigation warnings
NVG	Night Vision Goggle(s)
OIS	Object Identification Surface(s) (Heliport/HLS)
OLS	Obstacle Limitation Surface(s) (Aerodrome)
PC1	Performance Class 1
PC2	Performance Class 2
PC2WE	Performance Class 2 With Exposure
PC3	Performance Class 3
PRM	Precision Runway Monitoring
RAAF	Royal Australian Air Force
RD	Main Rotor Diameter
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
SDMH	Shoalhaven District Memorial Hospital
SEARs	Secretary's Environmental Assessment Requirements
SHR	Shoalhaven Hospital Redevelopment
SSD	State Significant Development
SSDA	State Significant Development Application
TDP	Takeoff Decision Point (Category A/Performance Class 1 operations)

Acronym	Meaning
TLOF	Touch Down and Lift Off Area. Load bearing min. 1 x main rotor diameter.
UHF	Ultra High Frequency
VFR	Visual Flight Rules
VHF	Very High Frequency radio
VMC	Visual Meteorological Conditions - allowing flight under VFR
V_{TOSS}	Take off Safety Speed
WAM	Wide Area Multilateration

3. SSD GENERAL REQUIREMENTS – AVIATION REGULATION

3.1. Regulatory Review

The SHR project is located outside the HMAS Albatross Aerodrome Control Zone and Control Areas (CTR/CTA). It is therefore not considered to be within "prescribed airspace" as defined in the Airports (Protection of Airspace) Regulations 1996.

The Shoalhaven Local Environment Plan (LEP), at Clause 7.9 contains a requirement to consider protection of the HMAS Albatross/NAS Nowra airspace. One of the objectives of the Clause is: "to provide for the effective and on-going operation of the HMAS Albatross Military Airfield by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport." The Clause states that "The consent authority may grant development consent for the development if the relevant Commonwealth body advises that… the development will not penetrate the Limitation or Operations Surface." For the purposes of this Clause, "***Limitation or Operations Surface*** means the Obstacle Limitation Surface or the Procedures for Air Navigation Services Operations Surface as shown on the *Obstacle Limitation Surface Map* or the *Procedures for Air Navigation Services Operations Surface Map* for the HMAS Albatross Military Airfield" and "***relevant Commonwealth body*** means the body, under Commonwealth legislation, that is responsible for development approvals for development that penetrates the Limitation or Operations Surface for the HMAS Albatross Military Airfield."

3.2. Standards applied to HLS development for NSW Health

The NSW Ministry of Health (MoH) policy document GL2020_014 Guidelines for NSW Hospital HLS of 1 July 2020 (the Guidelines) are the primary HLS design source material used in this report. The following documents provide excellent advisory material, guidelines and best practice standards and led to the development of the Guidelines:

- ICAO Annex 14, Vol II, Heliports;
- US FAA Advisory Circular AC 150/5390-2C, Heliport Design, (covers both operational and design criteria, particularly for hospital-based HLS' in Chapter 4, Hospital Heliports); and
- National Airports Safeguarding Framework Guideline H – Protecting Strategically Important Helicopter Landing Sites.

4. SSD GENERAL REQUIREMENTS – HLS IMPACTS AND OPERATIONS

4.1. HLS Approach and Departure Path Considerations

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.

Important criteria for approach/departure paths is that there be a minimum of two that are at least 135° apart.

4.2. Wind

The Bureau of Meteorology has an automated weather station at the Department of Defence aerodrome at HMAS Albatross (also known as Naval Air Station, Nowra) approximately 8.5km from the Shoalhaven District Memorial Hospital (SDMH) campus. The SDMH campus would be subject to very similar wind exposure as the HMAS Albatross aerodrome. The wind roses for this location show data based on annual, average wind readings for Nowra at 0900 and 1500 since 2000. The wind data points towards preferred approach and departure paths to/from the north-west and to/from the south-east. Refer to Figure 1 below. This information is relevant during planning to account for any obstructions along the paths.

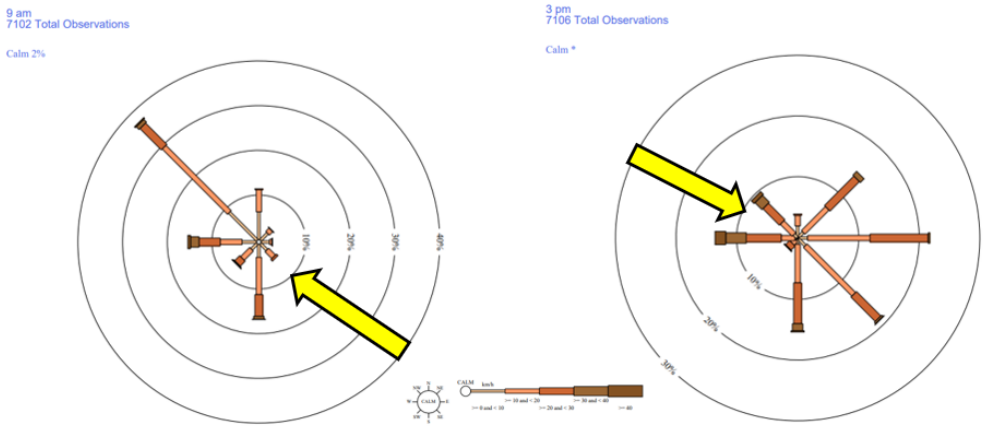

Figure 1: HMAS Albatross Aerodrome Wind Rose – Annual Average

4.3. Airspace

The airspace over the site has been reviewed for compliance with obstacle limitation surfaces (OLS) and Procedures for Air Navigation Services – Aircraft Operations (PANS OPS).

Relevant authorities are almost certain to advise, in relation to the development, that site structures and cranes WILL NOT penetrate the OLS or the PANS OPS lower limit for HMAS Albatross Aerodrome.

The general airspace arrangement over Nowra is depicted in Figure 2 below.

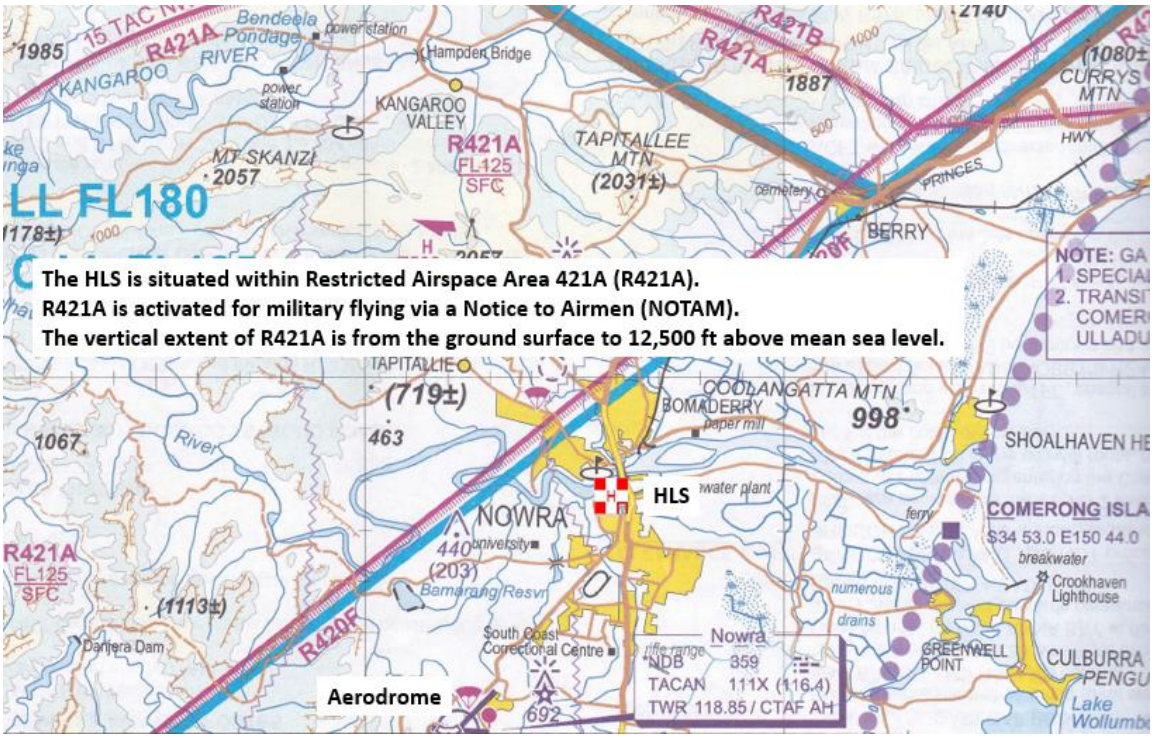

Figure 2: Airspace layout for HMAS Albatross Aerodrome

The SDMH campus and the new HLS are positioned within the confines of the HMAS Albatross Outer Horizontal Surface, however this surface does not apply below RL257.5. A building or crane would need to exceed RL257.5 to penetrate the HMAS Albatross OLS. See Figures 3 and 4 below.

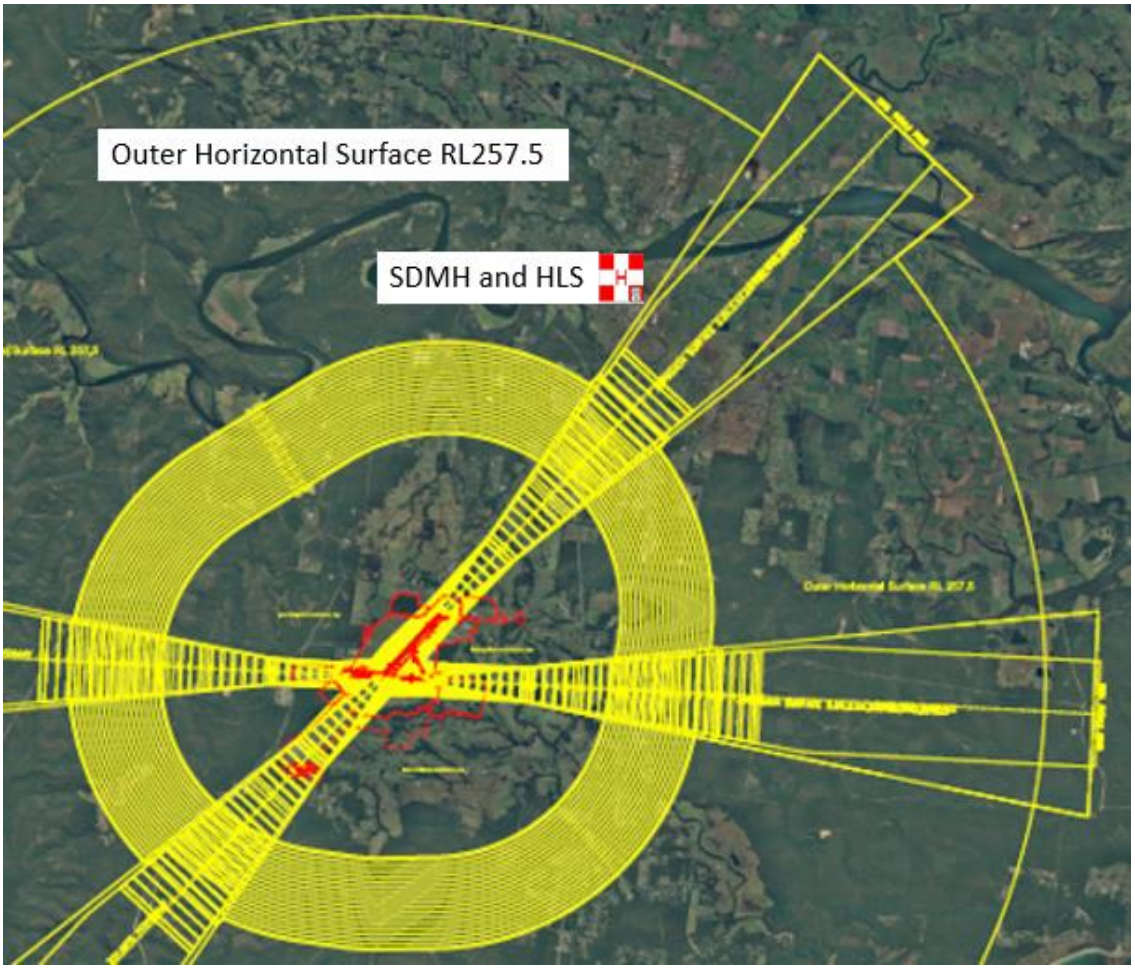

Figure 3: Obstacle Limitation Surfaces for HMAS Albatross Aerodrome (1)

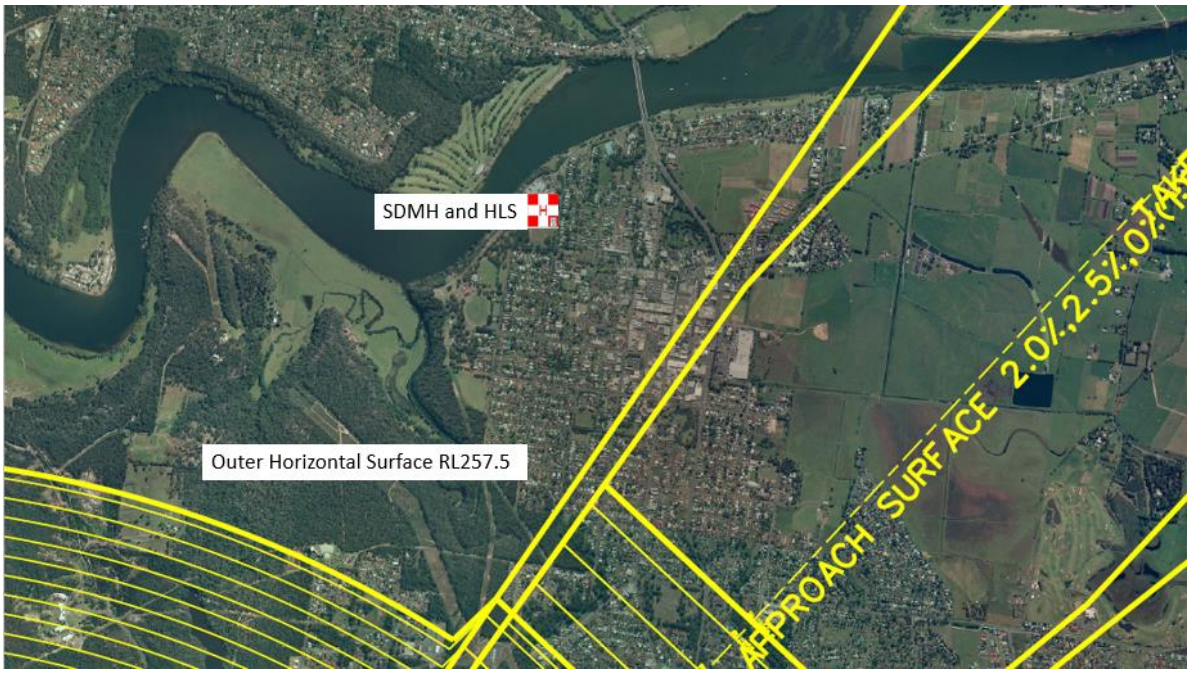

Figure 4: Obstacle Limitation Surfaces for HMAS Albatross Aerodrome (2)

Details of the OLS were obtained through early consultation with ADF (RAN) personnel from HMAS Albatross. From the air traffic perspective, AsA or in this case, the ADF are interested in the impact of high buildings on line-of-sight between ATC communications, navigation and surveillance (radar) systems. Sometimes, new buildings interrupt the line-of-sight between radio and radar repeaters and retransmission sites; and the aerodrome (HMAS Albatross). If there is doubt that airspace issues might impede development planning (this often happens in Sydney CBD hospital HLS developments e.g. Randwick and St George), early consultation with airspace authorities is recommended. In the case of SHR no early engagement was undertaken with AsA as no airspace issues were foreseen.

It is assessed that the positioning and proposed development of an HLS for the SHR 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 HLS, and in particular vertical obstructions such as cranes, can be addressed from a “safety to flight” perspective for helicopters operating near the new SHR and aircraft transiting in the vicinity.

The proposed new SHR HLS is sufficiently distant from HMAS Albatross aerodrome such that arriving and departing aircraft will not realise any traffic confliction with helicopters operating to and from it.

This report assesses that CASA, AsA, the ADF and Shoalhaven City Council will advise that there are no relevant impacts from this development.

4.4. Impacts on Sensitive Receivers

The approach and departure paths were planned with due cognisance of the Shoalhaven City Council’s strong preference that the river corridor be utilised for approaches and departures where possible. There are no known areas of sensitive environmental or ecological concern in the preferred approach and departure zone; and in any case, helicopters will use similar approach and departure profiles to what they use at the existing HLS, only at a greater height.

4.5. HLS Locations and Preferred Approach and Departure Path Directions

The location of the HLS for the SHR evolved as a result of the collaboration between Design Team members: the architectural team, the aviation consultant and clinical advisers, during the concept design development. The resulting Design Team guidance was for the HLS to be placed on the western side of the development. This is the best location for the HLS for several reasons, one of which is that it maximises the distance between the HLS and the residential area along Shoalhaven St.

Figure 5 below illustrates the planned approach and departure paths to the SHR 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 require stability in direction (see gold arrows). While, or once, an aircraft has safe single-engine flying speed the pilot is at liberty to manoeuvre and turn to suit the prevailing wind conditions and 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.

Figure 5: Approach and Departure Path Illustration at SHR HLS (large scale)

4.6. HLS Air Traffic Management

Aircraft arriving and departing from the SHR HLS will not require an ATC clearance and will not interfere with any instrument approach procedures for HMAS Albatross aerodrome. ATC will not be required to separate Helicopter Emergency Medical Service (HEMS) helicopters from civil, commercial or military air traffic. Because the lift overrun is positioned to the North-Eastern corner of the building's western portion, the approach and departure paths are oriented North-West to South–East. Taking into account prevailing winds and building layout, this arrangement is the best solution for an HLS if the approach and departure paths are to be kept in the required range of 135^0-180^0 apart.

4.7. Effects of Helicopter Operations on Buildings and Infrastructure

Figure 5 above illustrates the planned approach and departure paths to the SHR HLS minimise overflight of buildings within the SDMH campus to the maximum extent possible. There will be minimal overflight of the new hospital.

4.8. Effects of Helicopter Operations on Biodiversity in Nowra Park (Reserve)

Ground level below the new HLS will be approximately RL22.5 or 22.5 metres above mean sea level. The new HLS will be RL 56.9 or 56.9 metres above mean seal level. The new HLS will therefore be approximately 34.4 metres above ground level. This will raise the height of helicopters operating close to the hospital by an additional 34.4 metres higher than they currently operate. Helicopter main rotor downwash from a single-rotor helicopter dissipates outwards at an exponential rate when projected onto a flat surface. At approximately two Main Rotor Diameters (MRD) (one AW 139 MRD = 14 metres) the wind blast from the downwash is at a bearable level under the Beaufort Wind Scale and other comparable measures of wind comfort. It is generally accepted that at four levels below an HLS, main rotor downwash has dissipated sufficiently to permit open balconies, terraces and courtyards to be built without hazardous consequences. (N.B This is not the case for enclosed areas where downwash can recirculate and amplify). The new HLS is more than seven levels above the ground. Therefore, the flora and fauna in Nowra Park (Reserve) will be unaffected by HEMS operations to the new HLS. It should be noted that “Tree 50” especially is quite remote from the new HLS and as such will be well below the main rotor downwash “hazardous” zone.

4.9. Impact on Existing HLS

The existing HLS will close in order for the SHR to be developed on the same land. A temporary HLS will need to be developed. A separate plan for the management of the temporary HLS will be developed. As part of the planning process for the temporary HLS, an HLS Notification will be issued to coordinate the transition of Helicopter Emergency Medical Service (HEMS) operations from the existing HLS to the temporary HLS. A separate HLS Notification will be issued to alert HEMS operators to any obstructions or hazards (e.g. cranes) associated with/posed by the construction of the SHR. The Ozrunways database for the SDMH HLS (Shoalhaven Hospital - Nowra | Helipads (ozrunways.com)) which is used by HEMS operators to source relevant details for a hospital HLS will be amended to reflect the changes circumstances for the old and temporary HLS’s and the transition between them. It will be further modified in time to reflect arrangements for the transition to the new HLS.

4.10. Obstructions and VFR Approach/Departure Paths and Transitional Surfaces

One pair of proposed VFR Approach and Departure paths run North-West and South-East. The selection of these paths aims to achieve an obstacle free gradient of 2.6º (4.5%, 1:22.2 vertical to horizontal), measured from the forward edge of a 34m diameter safety area to a height of 152m above the FATO at a distance of ~3,386m.

The approach and departure paths commence at 34m width at the safety area edge and expand uniformly, laterally at an angle of 8.7^0/15%/1:12.8 to a width of 140 m, then remains parallel to a distance of 3,386 m, where the height is 152 m above the elevation of FATO surface. The VFR approach and departure paths are to be obstacle free. It is important to achieve the 2.6^0/4.5%/1:22.2 obstacle free slope to account for the performance requirements of one engine inoperative (OEI) flight following an emergency.

Subject to formal survey, it is apparent that there are no obstructions along the two pairs of proposed VFR Approach and Departure paths when judged from the estimated Performance Class 1 (PC1) survey datum points for each HLS.

5. SSD KEY ISSUES

5.1. Key Issue: Statutory and Strategic Context

Permissibility. Permissibility from an aviation perspective needs to be confirmed by the ADF/RAN and AsA. Application is made on behalf of Health Infrastructure by the Social Infrastructure team of the DPIE as part of the SSD process. No impediments to approval are anticipated.

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

5.2. Key Issue: Policies

NSW Health Policy. The HLS will meet the compliance requirements of NSW Health GL2020_014 Guidelines for NSW Hospital HLS. Whilst the Guidelines do not restrict flight over adjacent buildings, it is common practice in approach and departure path design to avoid such situations. It has been possible on this occasion to avoid overflight of most adjacent parts of the SHR (this has been minimised to the maximum extent possible). It has also been possible to avoid impacting any rooftop services e.g. cooling towers and vents, with rotor downwash.

5.3. Key Issue: Environmental Amenity

Acoustic Impacts. Acoustic impacts from helicopter flight operations to and from the proposed rooftop HLS are considered in the Acoustic Impact Assessment. Noise and vibration impacts of the temporary HLS (at the West St Oval) are not considered in detail in this report; however, a subjective assessment is that they will be minimal, and no worse than the noise impacts currently experienced by residents adjacent to Nowra Park (Reserve). It is noted that with a different constituency, noise and vibration near the temporary HLS may be an issue for some (temporarily). A separate management plan will be developed for the temporary HLS.

Ecological Impacts. There are no known areas of environmental or ecological significance that require specific protection from the impacts of helicopter operations to and from the new SHR HLS, noting that the existing HLS is in the exact same vicinity and the HEMS operators will be well aware of any sensitive areas. The same considerations and operational procedures for abatement will most likely apply for the new SHR HLS. This will be confirmed with HEMS operators as part of the SHR HLS commissioning process.

5.4. Key Issue: Contamination

The main contamination from an HLS is that of fuel product spillage. In the case of the new SHR HLS, this risk is significantly mitigated by not conducting refuelling operations or maintenance on the rooftop.

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

5.5. Key Issue: Drainage

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

5.6. Key Issue: Management of Cranage during construction

As the existing HLS will close during construction, the requirements of the National Airports Safeguarding Framework Guideline H – Protecting Strategically Important Helicopter Landing Sites are not applicable in this case.

6. CONSULTATION, CONCLUSION AND SUMMARY

6.1. Consultation

AviPro has consulted with the following organisations with no reportable feedback:

- Royal Australian Navy (HMAS Albatross) management,
- NSW Ambulance aeromedical operations, and
- Toll Helicopters (contracted helicopter operator).

6.2. Future Consultation

AviPro will further engagement with the following organisations as appropriate:

- Royal Australian Navy (HMAS Albatross),
- Health Infrastructure (Program Management),
- NSW Ambulance Service (the helicopter retrieval capability Director),
- Toll Helicopters (contracted helicopter operator), and
- NRMA CareFlight (contracted helicopter operator).

AviPro may also engage with the following additional organisations:

- AsA – if issues arise from the AsA DA submitted by DPIE,
- CASA - if regulatory change occurs that materially impacts the program.

6.3. Conclusion

The rooftop layout, as currently designed, is most suitable to host an HLS. Positioning of the lift overrun is the primary driver of the approach and departure paths, which in turn fit very well with historical prevailing winds. The SHR HLS will result in a minimal amount of overflight of populated areas for such a facility in a provincial city with surrounding residential areas. The SHR project (both building and cranes) will be found to have no impact on the HMAS Albatross Aerodrome OLS and will also be found to have no impact on any aviation communications, navigation and surveillance infrastructure. Aviation safety will not be compromised by the SHR project.

6.4. Summary

From an SSD perspective, in summary:

- Design of the new SHR HLS approach and departure paths conforms well with the most likely wind directions, and provide pilots with the best forced landing areas available in the event of emergencies requiring immediate landing on final approach to land or immediately after take-off; whilst concurrently avoiding built-up and sensitive areas to the maximum extent possible.
- The new SHR HLS building and associated cranes used for construction will not infringe prescribed (HMAS Albatross Aerodrome) airspace OLS and will not impact on any (HMAS Albatross Aerodrome) aviation communications, navigation and surveillance infrastructure.
- The HLS will be compliant with NSW Health GL2020_014 Guidelines for NSW Hospital HLS of 1 July 2020.