

AVIATION SSD REPORT: CAMPBELLTOWN HOSPITAL REDEVELOPMENT



15 Apr 19

Prepared for

ROOFTOP HELICOPTER LANDING SITE

NSW Health Infrastructure






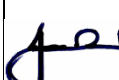
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This Report is prepared for the Campbelltown Hospital Redevelopment SSD by Resolution Response Pty. Ltd. ABN: 94 154 052 883, trading as 'AviPro'.

The Report relates to the aviation aspects associated with the establishment and site design of the proposed hospital rooftop helicopter landing site to inform Design and the other Submissions.

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1. SSD 9241 Requirements

1.1. Introduction

The Development Consent SSD 9241 dated 18 February 2019 required the following to be provided prior to the commencement of construction.

1.2. B39. Existing Helipad / Helicopter Operations During Construction Requirement.

Prior to the commencement of construction, helipad / helicopter operations at the site are to be reviewed by a suitably qualified and experienced aviation professional in consultation with relevant stakeholders. The review must consider the proposed construction methodology including plant and equipment to be used (including lighting and cranes) and recommend changes to the construction methodology and / or flight paths where required to ensure safe ongoing helicopter operations at the site. A report summarising the outcome of the review must be submitted to the Certifying Authority.

Response.

The Report is attached at Appendix 1.

1.3. B40. Proposed Helipad Design

Requirement.

Prior to the construction of the proposed helipad, a report prepared by a suitably qualified and experienced aviation professional must be submitted to the satisfaction of the Certifying Authority which states 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 other relevant National and International guidelines.

Response.

The report is attached at Appendix 2.

1.4. B41. Proposed Helipad Operations

Requirement.

Prior to the construction of the helipad, future ongoing helicopter operations to the site are to be reviewed by a suitably qualified and experienced aviation professional. Proposed flight paths to the helipad shall be identified 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 other relevant National and International guidelines.

A report summarising the outcome of the review and a Three-dimensional Visual Flight Rules Approach and Departure Path and Transitional Surface Survey must be submitted to the satisfaction of Certifying Authority and a copy submitted to the Department and Council.

Response.

A Report will be prepared and submitted as requested once the formal Flight Path Survey is completed.

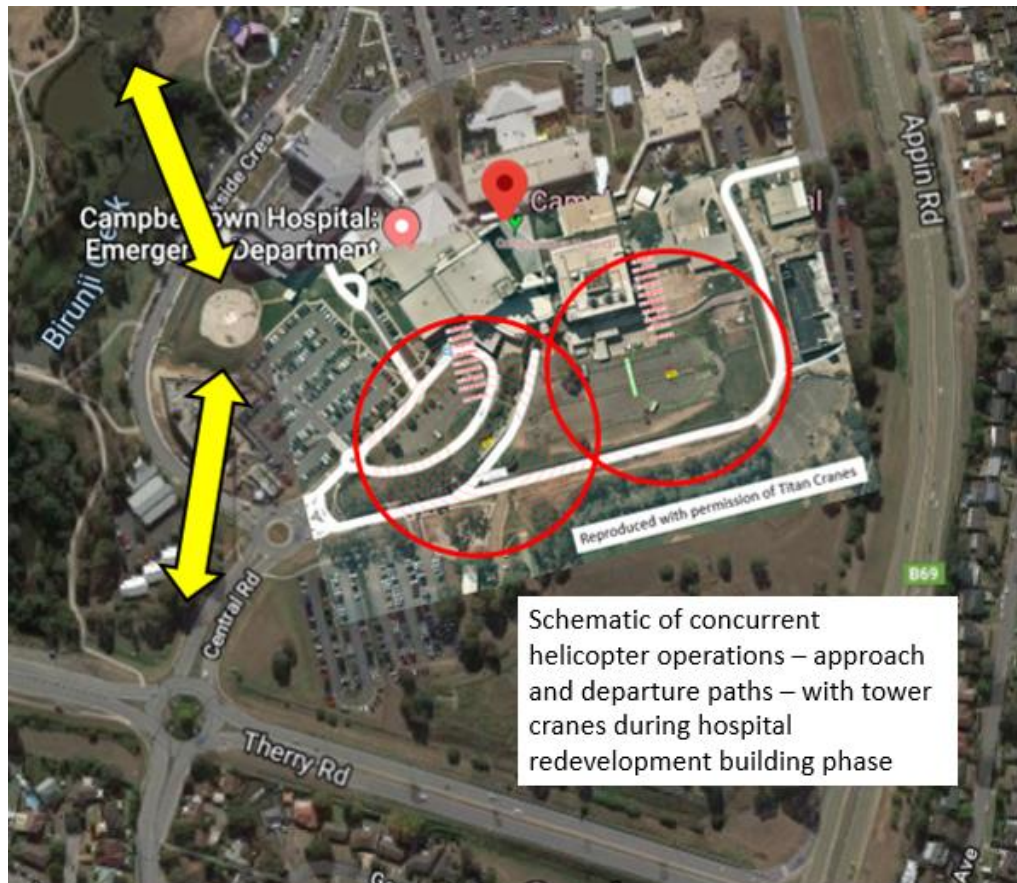


Figure 2: Tower Crane arcs and designated flight paths

2.4. Tower Cranes - General

Figure 2 illustrates the approach and departure paths and the proximity of the tower crane jib arcs to them. It will therefore be necessary to ensure:

- The cranes are illuminated at night.
- Construction staff are aware of the potential for helicopter operations to/from the on-grade HLS.

2.5. Tower CHR Crane Illumination

The illumination of cranes adjacent to hospital HLS is a contentious issue as the present regulatory requirement falls well short of operational necessity. The Civil Aviation Safety Authority (CASA) Manual of Standards (MOS Part 139) that addresses obstruction lighting was not designed to consider modern helicopter operations with night vision devices – especially around hospital HLS. As such, the following minimum lighting outline has been developed which provides pilots with situational awareness of the crane jib location and height – especially when the crane is in weather-vane mode.

As a minimum for all tower cranes:

- Top of crane A frame or cabin: medium intensity red obstruction light (night)
- Both ends of Jib: medium intensity red obstruction light (night)
- Along Jib: line of white LED fluro on a PE cell along the full length of the jib

- Tower section: stairway lights or spot lights attached to the top of the tower pointing down and onto the tower (not up into pilot eyes)

As a minimum for all luffing cranes:

- Top of crane A frame or cabin: medium intensity red obstruction light (night) and white by day
- End of Jib: medium intensity red obstruction light (night) and white by day
- Along Jib: line of white LED fluoro on a PE cell along the full length of the jib
- Tower: stairway lights/spot lights attached to the top of the tower pointing down and onto the tower (not up into pilots' eyes)

The LED jib Fluoro details are:

- Lights used: LED weather proof emergency fluoro (minimum 90-minute battery back-up)
- Lights are controlled via a PE Cell

It is essential LED strip lighting is not used as this is not visible to pilots using night vision devices.

2.6. Mobile Cranes

Mobile cranes will operate clear of existing approach and departure paths during construction and post-construction phases. A number of other mobile cranes already operate onsite. The existence of all mobile cranes onsite was advised to helicopter operators on Fri 12 Apr 19.

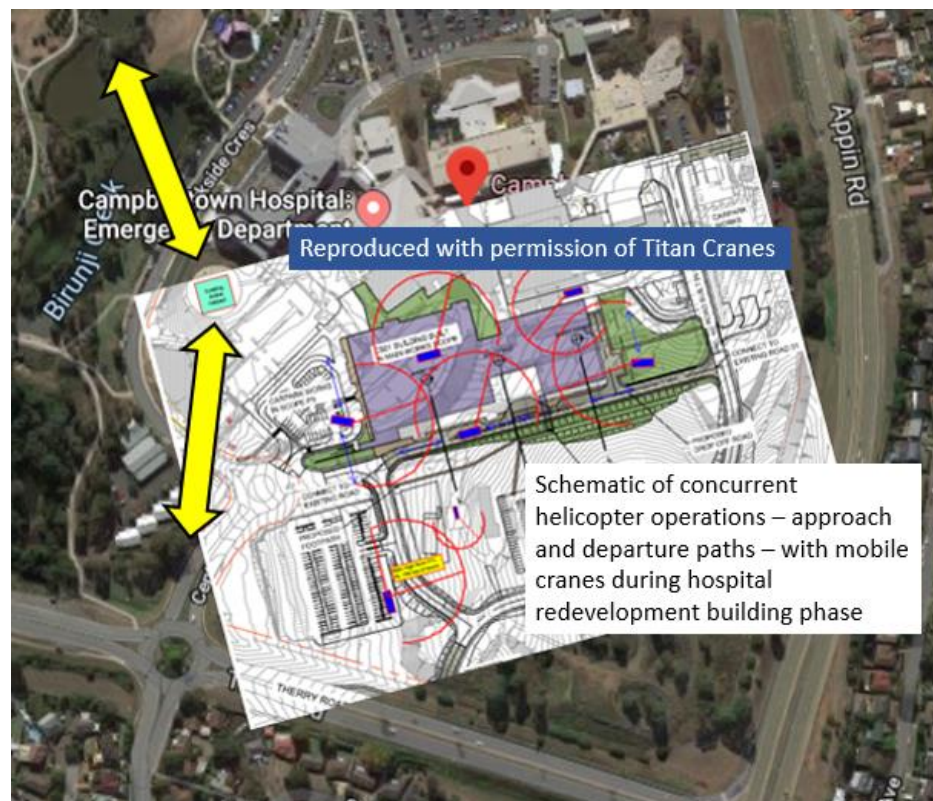


Figure 3: Mobile Crane arcs and designated flight paths - construction

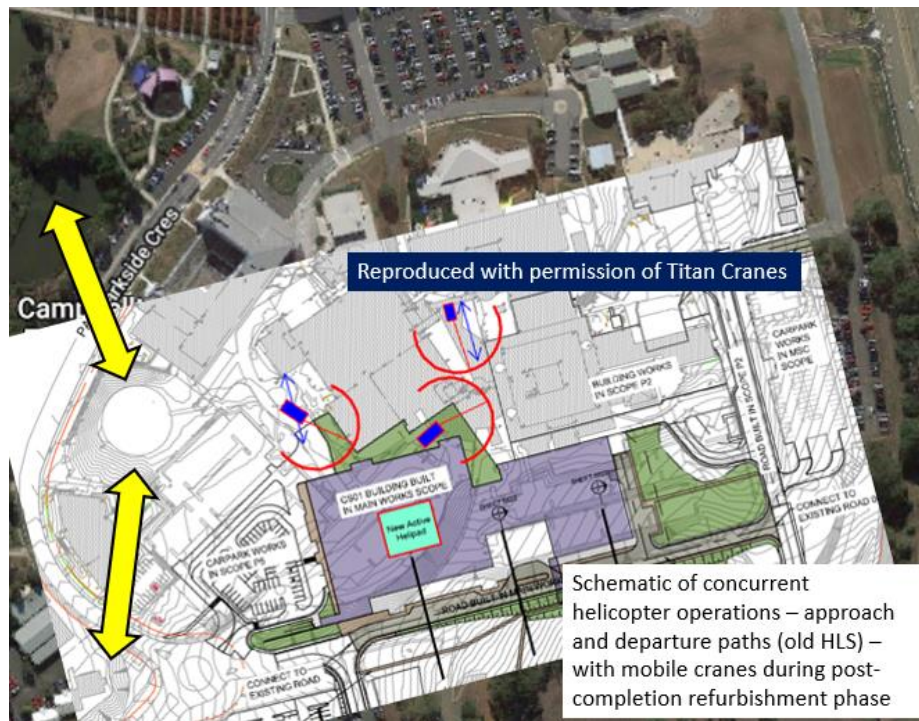


Figure 4: Mobile Crane arcs and designated flight paths for existing HLS

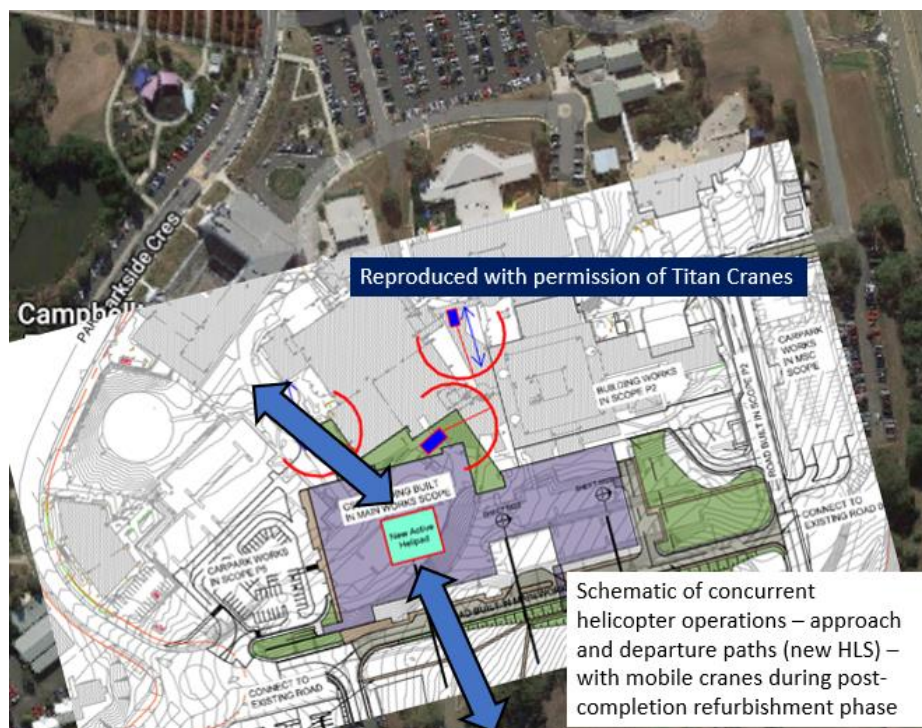


Figure 5: Mobile Crane arcs and designated flight paths for new HLS

Figures 3, 4 and 5 depict the relationships of mobile crane operations in relation to the existing and new HLS's (approach/departure paths) during the construction and post-construction phases. In the case of the post-construction phase with the new HLS in use, operations will be above the elevation of mobile cranes, thus they should not present as a hazard that requires specific treatment. Continued advice of mobile crane activity to NSW Ambulance will be required.

2.7. Crane Helicopter Interoperability Plan

Developing a crane/helicopter procedure is the preferred way to manage concurrent construction activities and helicopter operations. It would be applicable only during hours of construction and involves the cessation of lifting activities during a helicopter arrival/departure.

The outcome of the procedure means from a practical perspective, the crane jib is manoeuvred away from the flight path to allow the helicopter to access the HLS. It is not necessarily applicable during non-crane operating hours when the crane is in weather-vane mode.

The procedure needs to identify and address any risks to operating helicopters and/or the construction site, and potential disruptions to the helicopter patient transfer activity due to construction activities. It is possible that under certain circumstances, works may need to be temporarily suspended to accommodate a helicopter movement

The procedure is therefore recommended in order to manage:

- communication protocols for helicopter arrivals and departures, and
- HLS operational and construction considerations in order to ensure the mitigation of the effects of rotorwash and reduce the impact of construction activities on helicopter operations.

2.8. Concrete Tower Booms

The concrete tower booms for this development will be positioned below, and within the arcs of, the tower cranes. Therefore, the markings and lighting arrangements for the tower cranes will provide safety from the hazard of the booms. There is no requirement for the booms to be marked or lit in any particular way.

3. Conclusion

3.1. SSD 9241 Response to Conditions

This Report responds to the following conditions:

- a. **B39.** Existing Helipad / Helicopter Operations During Construction
- b. **B40.** Proposed Helipad Design
- c. **B41.** Proposed Helipad Operations

3.2. Cranes and Helicopter Operations

This Report also addresses the crane/helicopter interactions and the measures required to mitigate conflict risk.

4. Appendix

The following Appendix are relevant to this Report:

Appendix 1: B39. Existing Helipad / Helicopter Operations During Construction

Appendix 2: B40. Proposed Helipad Design

28 March 2019

REPORT – DEVELOPMENT CONSENT SSD 9241 REQUIREMENT B39

Reference:

- A. NSW Department of Planning and Environment SSD 9241 dated 18 February 2019
- B. NSW Health GL2018_010 Guidelines for Hospital Helicopter Landing Sites in NSW

Background

Reference A has stipulated condition B39 (Existing Helipad / Helicopter Operations During Construction) This condition is:

Prior to the commencement of construction, helipad / helicopter operations at the site are to be reviewed by a suitably qualified and experienced aviation professional in consultation with relevant stakeholders.

The review must consider the proposed construction methodology including plant and equipment to be used (including lighting and cranes) and recommend changes to the construction methodology and / or flight paths where required to ensure safe ongoing helicopter operations at the site. A report summarising the outcome of the review must be submitted to the Certifying Authority.

AviPro Qualifications

In our capacity as a suitably qualified and experienced aviation organisation, the design and operational interface for the conduct of helicopter emergency medical services (HEMS) into and from the proposed development rooftop HLS have been developed to the standards required by Reference B.

Managing Concurrent Construction and Helicopter Operations

During the construction of the Campbelltown Hospital Redevelopment Clinical Services Building (proposed development), the existing on-grade helicopter landing site (HLS) will continue operations.

The flight paths and construction activity (cranes and construction site) have been considered and will be detailed in the 'crane/helicopter operations procedure' to manage concurrent construction activities and helicopter operations.

The outcome of the procedure means from a practical perspective, the crane jib is manoeuvred away from the flight path to allow the helicopter to access the HLS during crane operating periods. The procedure is not applicable during non-crane operating hours when the crane is in weather-vane mode.

The crane/helicopter operations procedure will identify and address risks to operating helicopters and/or the construction site, and potential disruptions to the helicopter patient transfer activity due

to construction activities. It is possible that under certain circumstances, works may need to be temporarily suspended to accommodate a helicopter movement.

The procedure will therefore manage:

- communication protocols for helicopter arrivals and departures, and
- HLS operational and construction considerations in order to ensure the mitigation of the effects of rotorwash and reduce the impact of construction activities on helicopter operations.

Construction Methodology

The design of the flight paths into the existing HLS has been reviewed in consideration of the construction of the Clinical services Building. A generally northwest/southeast flight path will keep helicopters away from the development and crane complex in most wind conditions.

In addition to the crane/helicopter operations procedure, crane illumination is essential and will be over and above the requirements of the Civil Aviation Safety Authority (CASA) Manual of Standards (MOS Part 139).

The illumination of cranes adjacent to hospital HLS is a contentious issue as the present regulatory requirement falls well short of operational necessity. The MOS Part 139 components that address obstruction lighting was not designed to consider modern helicopter operations with night vision devices – especially around hospital HLS. As such, the following minimum lighting outline has been developed in conjunction with NSW Ambulance and NSW Health Infrastructure and provides pilots with situational awareness of the crane jib location and height – especially when the crane is in weather-vane mode.

As a minimum for all tower cranes:

- Top of crane A frame or cabin: medium intensity red obstruction light (night)
- Both ends of Jib: medium intensity red obstruction light (night)
- Along Jib: line of white LED fluro on a PE cell along the full length of the jib
- Tower section: stairway lights or spot lights attached to the top of the tower pointing down and onto the tower (not up into pilot eyes)

Summary

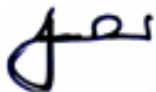
Continued safe access to the Campbelltown on-grade HLS during the construction of the approved development is essential for the ongoing service delivery function of the Campbelltown Emergency Rooms.

The flight paths for the existing HLS have been reviewed in consideration of the new building and associated construction activity.

The development of the crane/helicopter operations procedure will ensure all stakeholders are aware of the necessary steps that are required to be undertaken to ensure the mitigation of the effects of rotorwash and reduce the impact of construction activities on helicopter operations.

Further Information

For further information on this Report, please contact the undersigned.

A handwritten signature in black ink, appearing to read "Steve Graham".

Steve Graham

Managing Director

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28 March 2019

REPORT – DEVELOPMENT CONSENT SSD 9241 REQUIREMENT B40

Reference:

- A. NSW Department of Planning and Environment SSD 9241 dated 18 February 2019
- B. NSW Health GL2018_010 Guidelines for Hospital Helicopter Landing Sites in NSW

Background

Reference A has stipulated condition B40 (Proposed Helipad Design). This condition is:

Prior to the construction of the proposed helipad, a report prepared by a suitably qualified and experienced aviation professional must be submitted to the satisfaction of the Certifying Authority which states 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 other relevant National and International guidelines.

AviPro Qualifications

In our capacity as a suitably qualified and experienced aviation organisation, the design and operational interface for the conduct of helicopter emergency medical services (HEMS) into and from the proposed development rooftop HLS have been developed to the standards required by Reference B.

Helipad Design – Relevant National and International Guidelines

Currently within Australia, there are no set rules or regulations applicable to the design, construction or placement of HLSs. There may however be local council planning, location and movement Approvals required.

The appropriate legislation at present for the use of HLSs is Civil Aviation Regulation (CAR) 92 which places the onus on the helicopter pilot to determine the suitability of a landing site. The Civil Aviation Safety Authority 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 advisory publication (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 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.

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
- Annex 14: Aerodromes - Volume II: Heliports 4th Edition 2013

Even though the current edition of Annex 14 is dated 2013, recent amendments are largely superficial and the basic document goes back to 1995. Additional guidance on the design of heliports and Helicopter Landing Sites is provided in ICAO's Heliport Manual (Doc. No. 9261-AN/903), although this document is also somewhat dated as it was last amended as the 3rd Edition in 1995.

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.

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".

The resulting documents on the subject provide excellent advisory material, guidelines and best practice standards. 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).

- NSW Health GL2018_010 Guidelines for Hospital Helicopter Landing Sites in NSW dated 26 April 2018.

The Guidelines for Hospital Helicopter Landing Sites in NSW were prepared primarily around the ICAO and FAA guidelines and standards, utilising the most appropriate recommendations and practical HEMS operating procedures.

The NSW Guidelines for Hospital Helicopter Landing Sites in NSW are the standards that exceed the requirements of CAAP 92.2 (2).

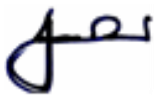
Summary

The creation and subsequent use of Reference B, NSW Health GL2018_010 Guidelines for Hospital Helicopter Landing Sites in NSW, in the design phase of the development has set a standard that exceeds the CAAP document.

The Guidelines provide detailed and specific operational, design, HLS marking and safety information that has been incorporated into the aviation reports, consultant information sessions and stakeholder meetings that together have resulted in a safe, functional and service delivery focused HLS capability.

Further Information

For further information on this Report, please contact the undersigned.

A handwritten signature in black ink, appearing to read "Steve Graham".

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