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Hospital Heliport Flight Path Protection Project
Technical Heliport Flight Path Report | Bacchus Marsh Hospital
For AECOM | Department of Health & Human Services

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GLOSSARY OF TERMS AND ABBREVIATIONS

AAV	Air Ambulance Victoria
AC	Advisory Circular
CAAP	Civil Aviation Advisory Publication
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
DHHS	Department of Health and Human Services
FAA	Federal Aviation Administration (US)
FATO	Final Approach and Take-Off Area
GEA	Australian terminology for a TLOF
Helipad	Commonly used to describe a coincident FATO and LLA
Heliport	ICAO terminology for a HLS
HLS	Helicopter Landing Site
HEMS	Helicopter Emergency Management Services
ICAO	International Civil Aviation Organisation
LLA	Landing and Lift-off Area (equivalent to TLOF)
MOS	Manual of Standards
NVG	Night Vision Goggles
OAA	Obstacle Assessment Area
OLS	Obstacle Limitation Surfaces
TLOF	Touchdown and Lift-off Area

1.0 INTRODUCTION

REHBEIN Airport Consulting in partnership with AECOM Australia Pty Ltd (AECOM) and Kneebush Planning has been commissioned by the Department of Health and Human Services Victoria (DHHS) to undertake the Hospital Heliport Flight Path Protection Project.

The DHHS is seeking to protect the flight paths of Emergency Medical Services (EMS) Helicopter Landing Sites (HLS) at 19 public hospitals in Victoria and one in Albury New South Wales.

The overarching objective of the project is to protect the flight paths of the HLS on public hospital grounds from intrusion by obstacles, such as buildings, structures, plumes and temporary works associated with new developments. In other words, the project is about operationally safeguarding the airspace corridor so as to minimise the risk that, in the future, medical transport helicopters will not be able to operate within mandated safety limitations for what is an essential community service. In the absence of a tailored planning control to protect or safeguard the flight paths of hospital based helipads, the capacity of Air Ambulance Victoria (AAV), the affected hospital and the Department of Health and Human Services, to minimise the impacts of development on helicopter flight paths is significantly diminished.

This report identifies the protection area for the existing heliport at Bacchus Marsh Hospital, Victoria. To assist in establishing the flight path protection area, the following resources have been utilised:

- Department of Health Victoria, now Department of Health and Human Services, Planning and Development *Guidelines for Helicopter Medical Transport Landing Sites*, January 2015;
- Civil Aviation Advisory Publication (CAAP) 92-2(2) *Guidelines for the Establishment of Onshore Helicopter Landing Sites*, February 2014; and
- Air Ambulance Victoria site summary sheet Baccus Marsh Hospital BACC V1, 4 August 2009.

2.0 APPLICABLE STANDARDS

There is currently an absence of specific Australian legislation covering physical and flight path protection requirements for Helicopter Landing Sites (HLS) in Australia. The Civil Aviation Safety Authority (CASA) does not currently have a legal instrument to certify or register HLS that are not an integral element of an aerodrome certified or registered under Part 139 of the Civil Aviation Safety Regulations 1998. In accordance with Civil Aviation Regulation 92 (CAR 92), it is therefore the responsibility of the pilot in command (and in some circumstances this is shared with the aircraft operator) to determine the suitability of a place as a helicopter landing site. Furthermore, CAR92 prohibits the use of a place as an aerodrome unless the place is suitable for the intended aircraft operations, and this must have regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions) such that the flight can be conducted in safety.

Guidelines to pilots for the identification of suitable HLS are provided by CASA through its Civil Aviation Advisory Publication (CAAP) 92-2(2) *Guidelines for the establishment and use of helicopter landing sites (HLS)*. CAAP 92-2(2) was issued in final form in February 2014 and is the third issue of the guidance document, superseding the previous version which had been issued in 1996. CAAP 92-2(2) provides advice on the minimum physical parameters required to assist helicopter pilots and operators in meeting their obligations under CAR 92. Consideration should be given to the guidelines promulgated by CAAP 92-2(2) as the decisions made by pilots and operators will have a significant impact on the usability of an HLS.

As neither CASA, nor pilots, have the powers to protect flight paths, the DHHS has sought to apply the Design and Development Overlay (DDO) as a means to protect emergency helicopter flights paths at relevant public hospitals. The use of DDO's to protect flights paths are currently implemented elsewhere in Victoria.

In January 2015, the State Government of Victoria Department of Health and Human Services released the Planning and Development Guidelines - *Guidelines for Helicopter Medical Transport Landing Sites*. These guidelines were developed to incorporate current and proposed local regulatory framework along with relevant international standards and recommended practices for developing helicopter landing sites. The DHHS guidelines provide the basis for determining both the physical and airspace requirements for medical helicopter landing sites to support Performance Class 1 (PC1) and Performance Class 2 (PC2) operations.

In accordance with the Guidelines a helicopter landing site is defined as:

- A helicopter landing site ('HLS') for helicopters engaged in helicopter medical transport operations is a facility provided to enable the safe and efficient transfer of critically ill patients by helicopter and associated activities.

The objectives of the Guidelines are to:

- Support the planning, design development and operation of heliports that enable the safe and efficient operation of helicopters engaged in medical transport operations
- Ensure the development and construction of heliports follows best practice and reflects applicable Australian and international regulations, standards and recommended practices
- Enable details, including any cost–benefit analysis, for the planning, development and operation of heliports to be integrated with hospital service and master plans
- Provide guidance to public healthcare services and other heliport owners in relation to the management, operation and maintenance of a heliport
- Support effective consultation with user groups and stakeholders including landowners, local governments, communities and responsible authorities.

Key principles established by the Guidelines are:

- The desired minimum usability for a site is 95 per cent. Multiple flightpath tracks are often needed to achieve that result and as such single flightpaths are to be avoided where possible.
- A site that can remain viable for a period of not less than 10 years.
- These guidelines apply to heliports that are intended to enable patient transfer by helicopters conducting medical transport operations in Victoria.
- The guidelines are broadly applicable to ground-level and elevated facilities at onsite or offsite locations, and include the airspace associated with arrival and departure flightpaths.
- The physical requirements for heliports and associated airspace have been developed to support Performance Class 1 and Performance Class 2 flights.
- The department will always aim to locate, design and build new surface-level heliports that support helicopter flights to operate in Performance Class 1. If a heliport is necessary at a health service, and the physical characteristics of a surface-level site cannot meet the criteria for Performance Class 1 flights, it may be possible to consider facilities that support Performance Class 2 flights.

For the purposes of this project, the DHHS Guidelines have been used as the primary guidance material to establish the flight path protection areas. The DHHS Guidelines do not specify limiting extents for HLS flight paths whereas CAAP 92-2(2) recommends 3,386m for PC1 (Slope Category A) operations to align with International Civil Aviation Organisation (ICAO) recommendations and to ensure future PC1 operations are protected. In the absence of mandated flight path protection extents, DHHS has nominated that the flight path protection areas developed in this project do not extend beyond a maximum horizontal distance of 1130m from the edge of the HLS Safety Area.

3.0 HELIPORT DETAILS

3.1 GENERAL ARRANGEMENT

The Bacchus Marsh Hospital heliport is a ground level facility consisting of a one (1) concrete TLOF area as shown in **Figure 1** below. The FATO is undefined but is assumed to be coincident with the TLOF and incorporates the adjacent landscape and roadway areas.

Figure 1: Heliport Arrangement



3.2 LOCATION AND ELEVATION

The Bacchus Marsh Hospital heliport location and elevation details are documented in the Air Ambulance Victoria (AAV) site summary sheet. The heliport characteristics are summarised in **Table 1**. A copy of the AAV Site Summary Sheet is included in **Appendix A**.

Table 1: Heliport Location & Elevation

		AAV Site Summary Sheet	
Heliport Centre Co-ordinates	WGS84	S37°40.70'	E144°26.06'
	MGA94 (Zone 55)	273743E	5826773N
Heliport Elevation	ft	330	
	m (AHD)	100.6	

3.3 SITE INSPECTION

An inspection of the HLS was conducted on 15 October 2015. The purpose of the inspection was to gain an understanding of the surrounding topography and structures around each site, and along the designated flight paths. The helipad and surrounds are shown in the photos in **Appendix B**.

The site inspection included discussion with hospital personnel with respect to typical helicopter operations and the surrounding land use.

4.0 FLIGHT PATHS

4.1 METHODOLOGY

Bacchus Marsh Hospital does not have a Heliport Operations Manual for the HLS and the AAV Site Summary Sheets do not define specific flight path tracks by bearing. Therefore potentially usable flight path directions have been identified based on the site inspection of the HLS and discussions with AAV and Victoria Police.

As no defined flight path/s are defined, sectors containing the potentially usable flight path directions are being protected. The general flight path directions identified are to the south and to the north-west.

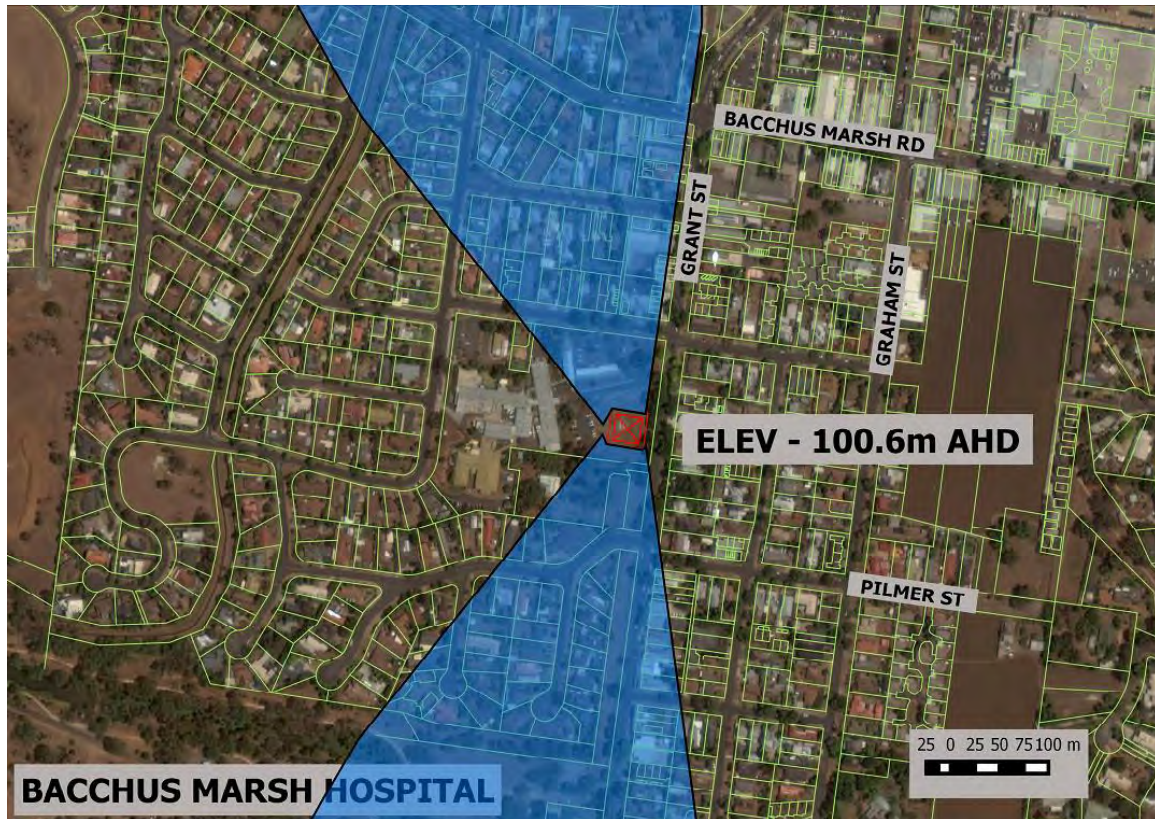
4.2 PROTECTED FLIGHT PATH

The flight paths align perpendicularly with the TLOF orientation with a bearing of approximately 164°/344° (True) and 016°/196° (True). The magnetic variation for Bacchus Marsh Airport obtained from the AIP-ERSA is 11° East, giving a Magnetic Bearing of 153°/333° and 005°/185°.

The flight path sector to the south west contains existing vegetation and the flight path to the north-west is traverses the existing hospital buildings to the west and vegetation to the east. A usable sector width of 30 degrees, located centrally about the flight path orientation has been adopted. This approach is consistent with other heliports that do not have defined flight paths.

The flight paths sectors are shown in Figure 2.

Figure 2: Flight Paths



Based on the DHHS guidelines, the Obstacle Limitation Surface (OLS)¹ commences at the edge of the HLS Safety Area (i.e. the edge of the helipad) and extends radially along a flat plane equivalent to the height of the helipad for 240m. Thereafter, the OLS gradually rises at 4.5% until it reaches 40 metres above the helipad elevation at a distance of 1,130 metres from the helipad. It is to these areas that the DHHS is seeking to apply the Inner and Outer Design and Development Overlays (DDOs).

The elevation of the helipad at Bacchus Marsh Hospital is 100.6 metres (AHD). Therefore, the OLS height limitation up to 240 metres from the helipad is also 100.6 metres (AHD). For this area, the DHHS proposes to apply the 'Inner DDO' in a 360° radius around the helipad.

Thereafter, the OLS gradually rises at 4.5% until it reaches 140.6 metres (AHD) at 1,130 metres from the helipad. Protection of this area is separated into two segments:

¹ The OLS is an inclined plane (or combination of planes) that defines the design height limits for any obstacles located within the OAA.

- Between 240 metres and 460 metres from the helipad, the 'Inner DDO' of 100.6 metres (AHD) will be applied to protect the flight path.
- Between 460 metres and 1,130 metres from the helipad, the 'Outer DDO' of 110.6 metres (AHD) will be applied to protect the flight path.

The 'Inner DDO' will ensure that any structures, works or plumes that are 100.6 metres (AHD) or higher and within 460 metres of the helipad are referred to the DHHS for an assessment of the impacts to the flight path.

The 'Outer DDO' will ensure that any structures, works or plumes that are 110.6 metres (AHD) or higher and between 460 metres and 1,130 metres are referred to the DHHS for an assessment of the impacts to the flight path.

Where new developments and/or Government strategies propose to develop land that would result in structures, works or plumes (potentially) being within the flight path sectors, higher than 140.6 metres (AHD) and between 1,130 and 3,386 metres from the Bacchus Marsh Hospital helipad, the DHHS should be consulted on the potential implications for the proposals to affect the continued operations of the helipad.


The OLS for each of the above flight paths has been prepared and shown on plan **M15028-F010** in **Appendix C. Table 2** summarises the key characteristics of the sectors.

Table 2: Flight Path Protection Area

Flight Path/Sector	Start Width (at edge of Safety Area)	Start Elevation (at edge of Safety Area)	Flight Path Sector End Width (at 1130m from edge of Safety Area)	End Elevation (at 1130m from edge of Safety Area)
153°/333° (South- west approach) (Magnetic)	45m	100.6m AHD	740m	140.6m AHD
005°/185° (North- west approach) (Magnetic)	45m	100.6m AHD	740m	140.6m AHD

APPENDIX A

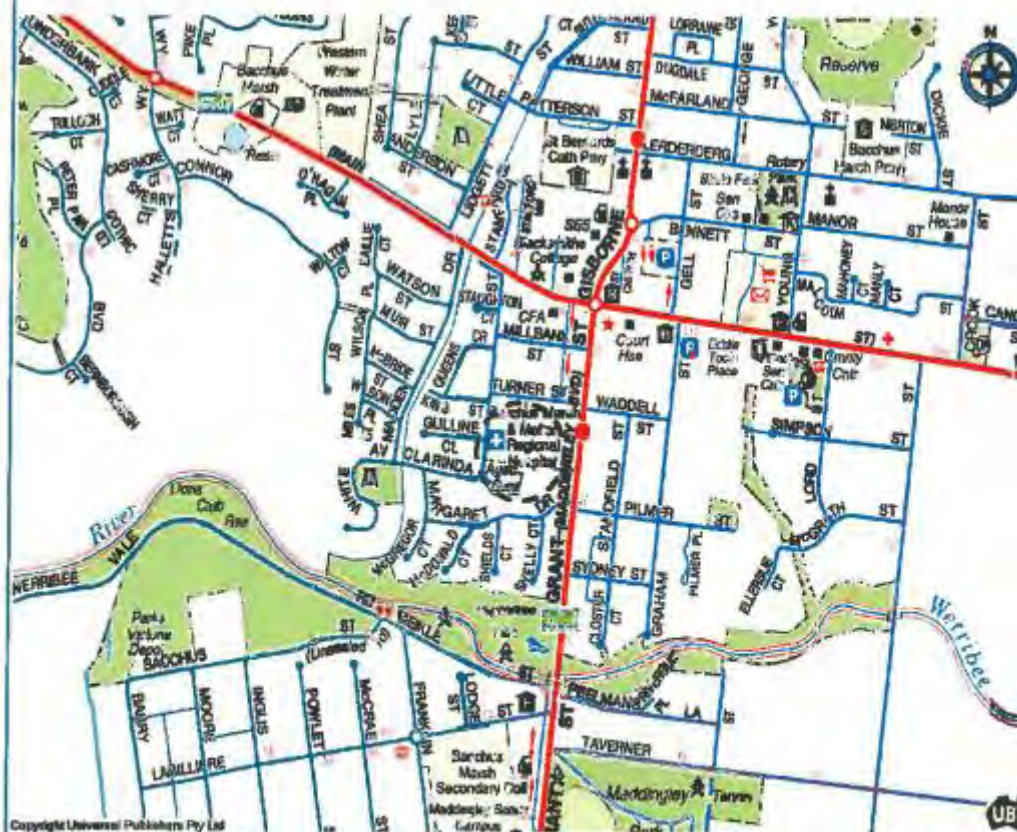
AAV SITE SUMMARY SHEET

Air Ambulance Victoria Helipads			
Name:	BACCHUS MARSH HOSPITAL	BACC	Elev AMSL: 330'
Location:	Grant St, Bacchus Marsh. Vic 3340	10nm LSALT:	3900'
			
Coordinates:	S37°40.69' - E144°26.06''	Road Map:	Mel: p333 H7
Radios:	MEL RDR 135.70	CTAF 118.80	
Nav aids:	Nil		
Lighting:	Yes. Maintenance: Tel: (03) 5367 9603 AH: 0419 507 535		
Nearest Airfield:	Bacchus Marsh 3.2nm 200°M		
Nearest Fuel:	EN 30nm Hdg 110°M		
Hazards:	Tall trees approx 60' AGL		
	Radar LSALT 2900' over township, 2400' 2nm East of township.		
	3400' boundary at North West corner of township perimeter.		
Special Ops:	North/South approach only		
	Concrete pad, 22m circular LLA/ 60m x 75m safe area		
	Djerriwarrh Health Service - Tel: (03) 5367 2000		
	Moorabool Shire Council - Tel: (03) 5366 7100		

Version: 1

Sheet 1 of 2

Date: 4/08/2009

Air Ambulance Victoria Helipads			
Name:	BACCHUS MARSH HOSPITAL	BACC	Elev AMSL: 330'
Location:	Grant St, Bacchus Marsh. Vic 3340	10nm LSALT:	3900'
Ambulance:	Not required		
Security:	Not required		
Response Auth:	Bacchus Marsh Hospital		
Contact:	Tel: (03) 5367 2000		
Pre-Landing:			
<p>Road Map: Mel: p333 H7 Edition 36</p> 			

Version: 1

Sheet 2 of 2

Date: 4/08/2009

Note: These images are extracts from a controlled document and are not to be relied on as a current source of technical details relating to the helipad.

APPENDIX B

SITE PHOTOS

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9

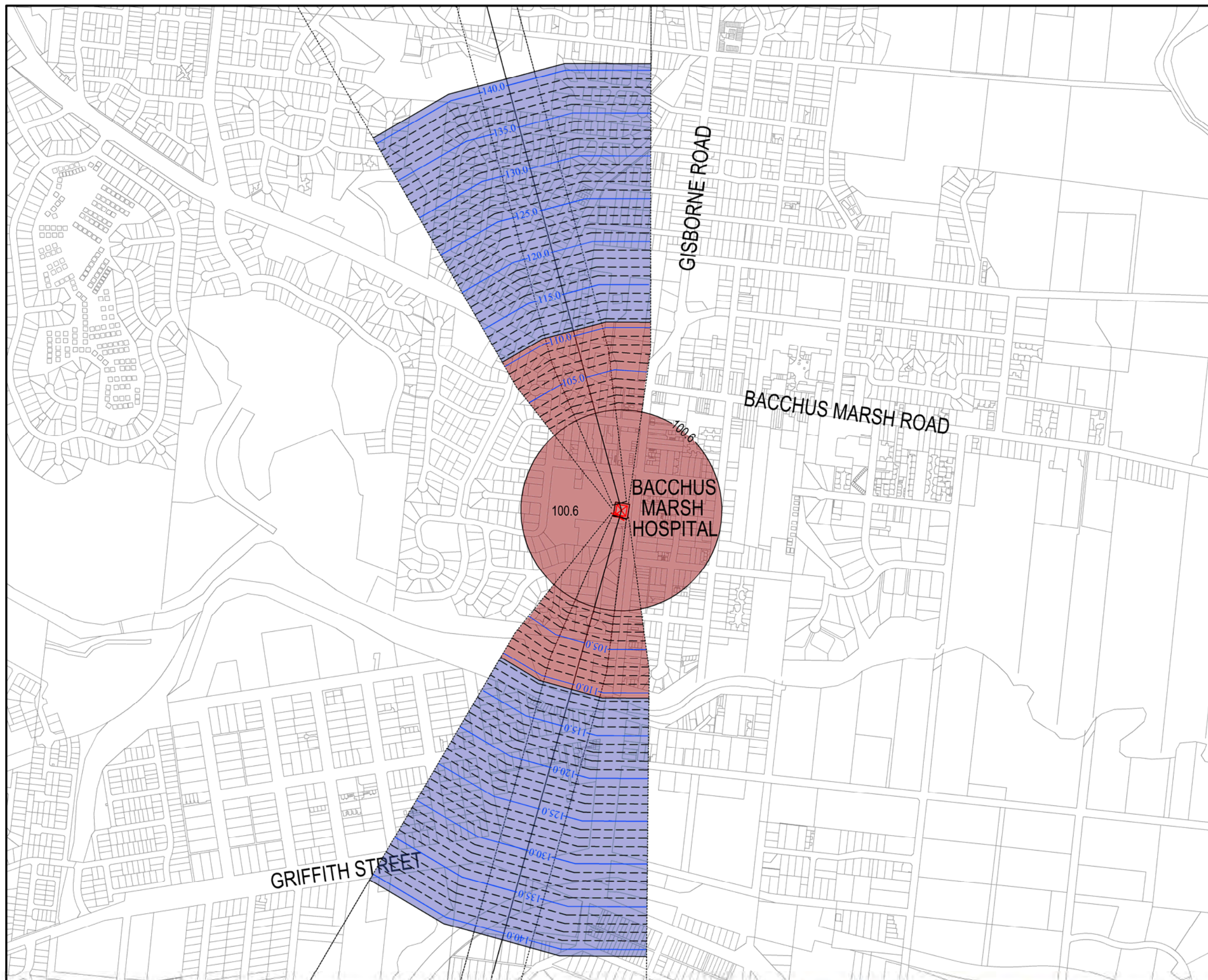


Photo 10



APPENDIX C

FLIGHT PATH PROTECTION MAP



LEGEND

- 0-460m
- 460-1130m
- 5m OLS CONTOUR
- 1m OLS CONTOUR

NOTES

- ALL CONTOURS SHOWN TO NEXT WHOLE NUMBER BEYOND 1130m HORIZONTAL DISTANCE
- CONTOUR LEVELS ARE TO AHD.



ISSUED FOR INFORMATION
04 Mar, 2015 - 11:38am

Project:
**HOSPITAL HELIPORT
FLIGHT PATH
PROTECTION PROJECT**

Client:
DEPARTMENT OF HEALTH and HUMAN SERVICES
Title:
**FLIGHT PATH PROTECTION PLAN
BACCHUS MARSH HOSPITAL**

State
Government
Victoria

kp kneebush
planning
AECOM

REHBEIN

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