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Hospital Heliport Flight Path Protection Project
Technical Heliport Flight Path Report | Bendigo 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 helicopter landing site (HLS) at Bendigo Hospital. 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
- Bendigo Hospital Project *Rooftop EMS Helipad Facility Concept Planning and Design Report* prepared by PSNK Aeronautical Services for Lend Lease (May 2014 and Update – May 2017 versions)

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.

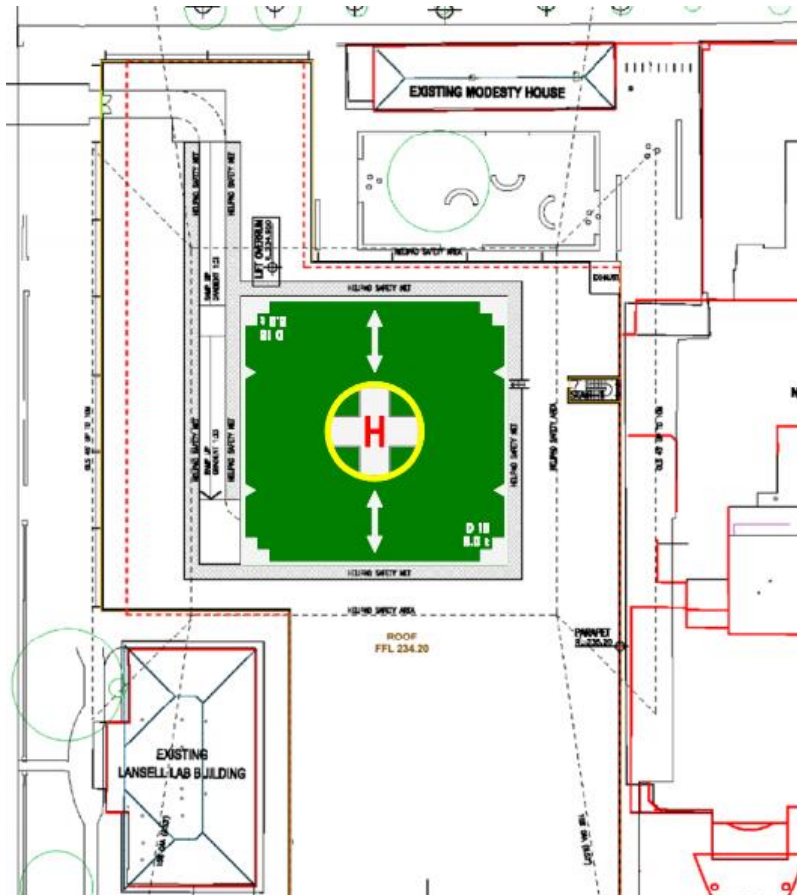
For the purposes of this project, the DHHS Guidelines have been used as the primary guidance material to establish the flight path protection areas. The DHHS Guidelines do not specify limiting extents for HLS flight paths whereas CAAP 92-2(2) recommends 3,386m for PC1 (Slope Category A) operations to 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 proposed Bendigo Hospital heliport will be an elevated facility consisting of a one (1) concrete TLOF area as shown in **Figure 1** below.

Figure 1: Heliport Arrangement



3.2 LOCATION AND ELEVATION

The heliport location details are documented in the *Bendigo Hospital Project Rooftop EMS Helipad Facility Concept Planning and Design Report* prepared by PSNK Aeronautical Services for Lend Lease. The helipad elevation was advised by Lend Lease by email in December 2015. The heliport characteristics are summarised in **Table 1**.

Table 1: Heliport Location & Elevation

Heliport Centre Co-ordinates	WGS84	S36°16.07'	E143°21.17'
	MGA94 (Zone 55)	711355E	5983757N
Heliport Elevation	ft	774	
	m (AHD)	235.9	

3.3 SITE INSPECTION

An inspection of the heliport facilities was conducted on 13 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 A**.

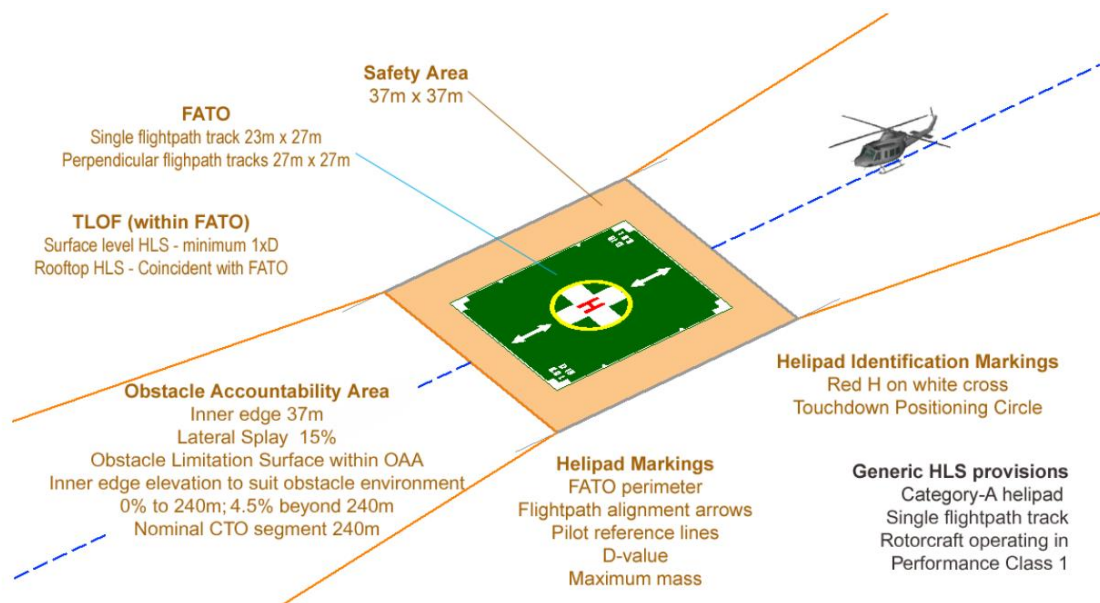
The site inspection included discussion with hospital personnel with respect to typical helicopter operations and the surrounding land use.

4.0 FLIGHT PATHS

4.1 METHODOLOGY

The Bendigo Hospital Helipad has a single preferred flight path direction which is defined in the Bendigo Hospital Project *Rooftop EMS Helipad Facility Concept Planning and Design Report* prepared by PSNK Aeronautical Services for Lend Lease. As flight paths are defined for the HLS, sectors along the flight paths replicating the geometry of the Obstacle Accountability Area (OAA) as detailed in the DHHS Guidelines should be protected. **Figure 2** is an extract from the DHHS Guidelines showing the OAA arrangement relative to the HLS.

Figure 2: OAA Details



Source: DHHS Guidelines, January 2015

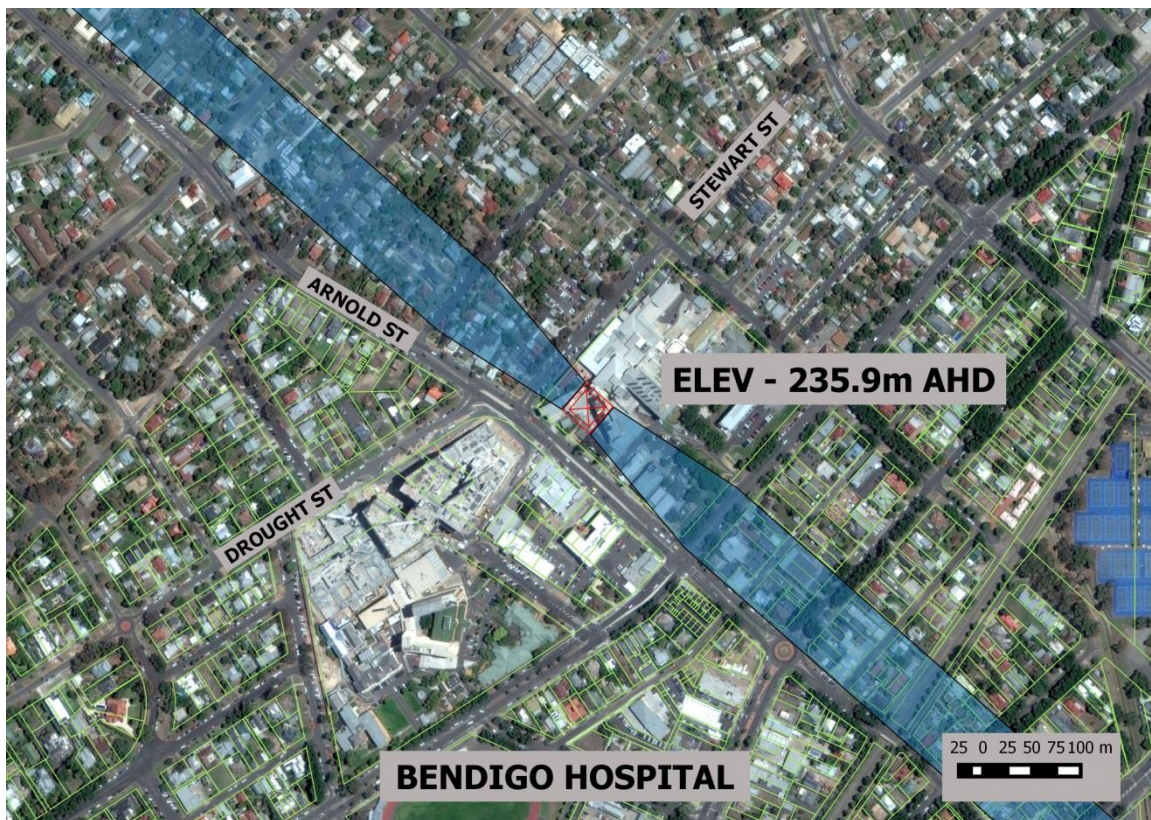
An additional buffer area has been added to each side of the flight path sectors to allow for the locating of cranes during construction works occurring outside but adjacent to the flightpath area. The width of the buffer area has been adopted as 70m to encapsulate a tower crane boom length of 60m.

4.2 PROTECTED FLIGHT PATH

Approach/departure paths on bearings of 130°/310° (True) are documented in the *Bendigo Hospital Project Rooftop EMS Helipad Facility Concept Planning and Design Report* prepared by PSNK Aeronautical Services for Lend Lease. The magnetic variation for Bendigo is 11° East, giving a Magnetic Bearing of 120°/300°.

The flight paths are shown in **Figure 3**.

Figure 3: 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 Bendigo Hospital is 235.9 metres (AHD). Therefore, the OLS height limitation up to 240 metres from the helipad is also 235.9 metres (AHD). For this area, the DHHS proposes to apply the 'Inner DDO' in a 360° radius around the helipad.

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

Thereafter, the OLS gradually rises at 4.5% until it reaches 275.9 metres (AHD) at 1,130 metres from the helipad. Protection of this area is separated into two segments:

- Between 240 metres and 460 metres from the helipad, the 'Inner DDO' of 235.9 metres (AHD) will be applied to protect the flight path.
- Between 460 metres and 1,130 metres from the helipad, the 'Outer DDO' of 245.9 metres (AHD) will be applied to protect the flight path.

The 'Inner DDO' will ensure that any structures, works or plumes that are 235.9 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 245.9 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) higher than 275.9 metres (AHD) and between 1,130 and 3,386 metres from Bendigo 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-F012** in **Appendix B**

APPENDIX A

SITE PHOTOS

Photo 1



Photo 2



Photo 3

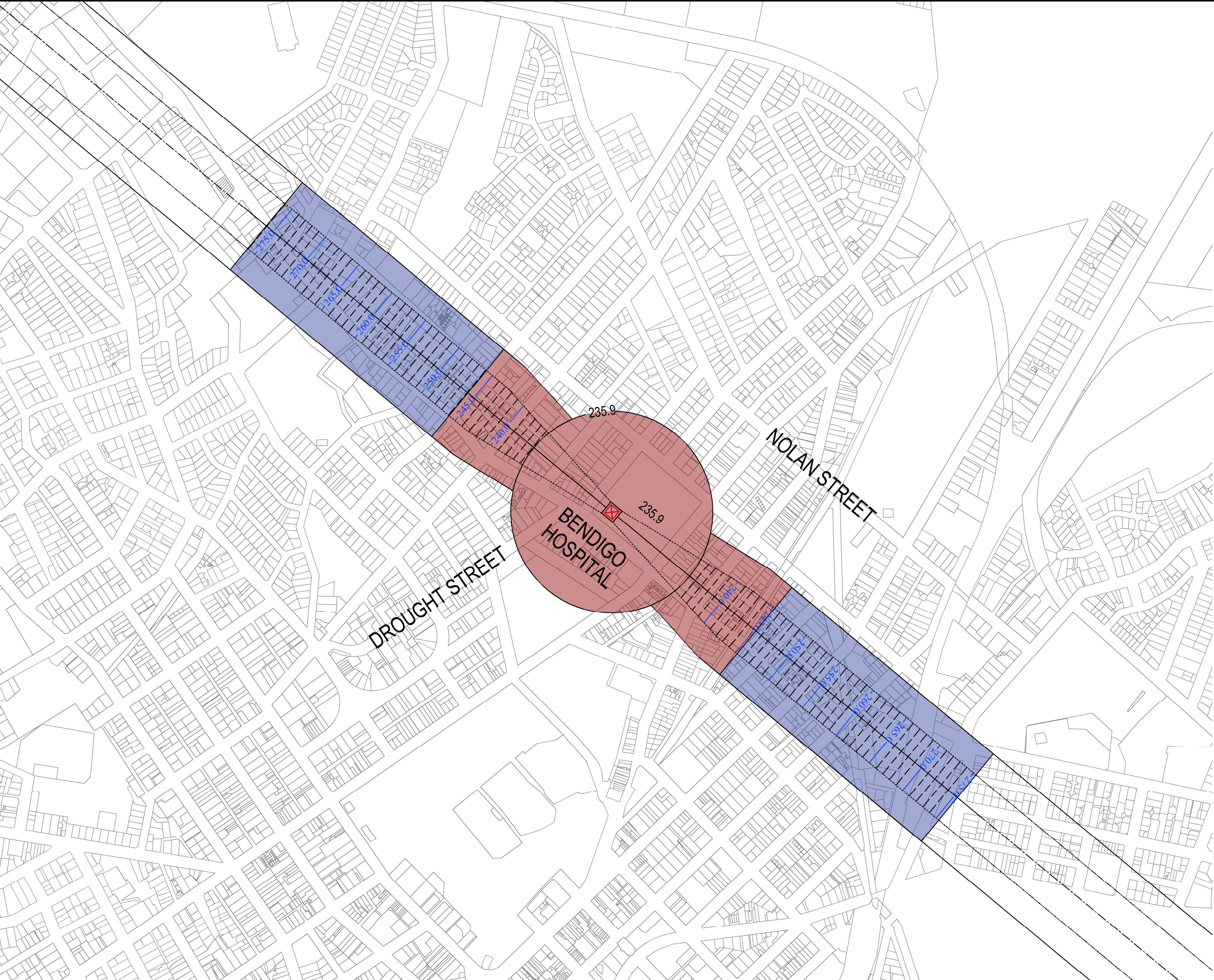


Photo 4




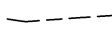


APPENDIX B

FLIGHT PATH PROTECTION MAPS

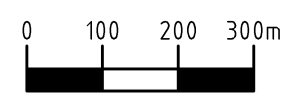


LEGEND

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

NOTES

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

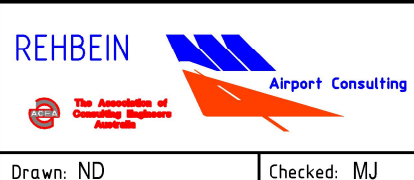


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Project:
**HOSPITAL HELIPORT
FLIGHT PATH
PROTECTION PROJECT**

Client:
DEPARTMENT OF HEALTH and HUMAN SERVICES

Title:
**FLIGHT PATH PROTECTION PLAN
BENDIGO HOSPITAL**



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