

11 October 2021

BN202272

Heliport Developers P/L
Mark Harrold
c/- Colliers International Pty Ltd
Level 30 Grosvenor Place
225 George Street
SYDNEY NSW 2000

Dear Mark,

Re: Sydney Helicopters – Enabling Works – Floodplain Risk Management Assessment

Northrop Consulting Engineers have been engaged to undertake a flood risk assessment for the proposed Penrith Lakes Heliport at 89-151 Old Castlereagh Road, Castlereagh. An assessment has been undertaken in accordance with SEAR Number 1469, which is reproduced in part below.

Hazards and risks – including ... an assessment of the potential impacts on floodplain and stormwater management including flood hazard; the impact of flooding on the proposed development, and the development's impact on flood behaviour; and egress and safety in a flood event and any impact to flooding in the catchment with consideration of the Hawkesbury – Nepean Valley Flood Risk Management Strategy.

The purpose of this correspondence is to summarise the existing site conditions and proposed development, outline the existing flood hazard, and describe how the proposed development addresses the SEARs.

Existing Site Conditions

The subject site is located at 89-151 Old Castlereagh Road, Castlereagh and is otherwise known as Lot 2 DP 1013504. It is bounded by Old Castlereagh Road to the south and existing development on other lot boundaries. Site elevations range from approximately 15 to 26 metres AHD (Australian Height Datum) with terrain sloping away from Old Castlereagh Road. There are existing improvements on the lot, with several structures on the higher portions of the lot and a hardstand area to the east. The lower areas to the east are densely vegetated and there is a pond on the north-western portion of the lot.

An aerial photo showing the subject site and immediate surrounds is presented overleaf in Figure 1.

Proposed Development

The proposed development includes removal of several structures and trees and construction of a new hardstand area. Minor earthworks are proposed to facilitate desired grades and levels.

A demolition plan and site plan are presented overleaf in Figure 2 and Figure 3.

		Date
Prepared by	GB	11/10/2021
Checked by	SN	11/10/2021
Admin	GB	11/10/2021



Figure 1 - Subject site (Aerial - SIX Maps, Lot data - LPI)

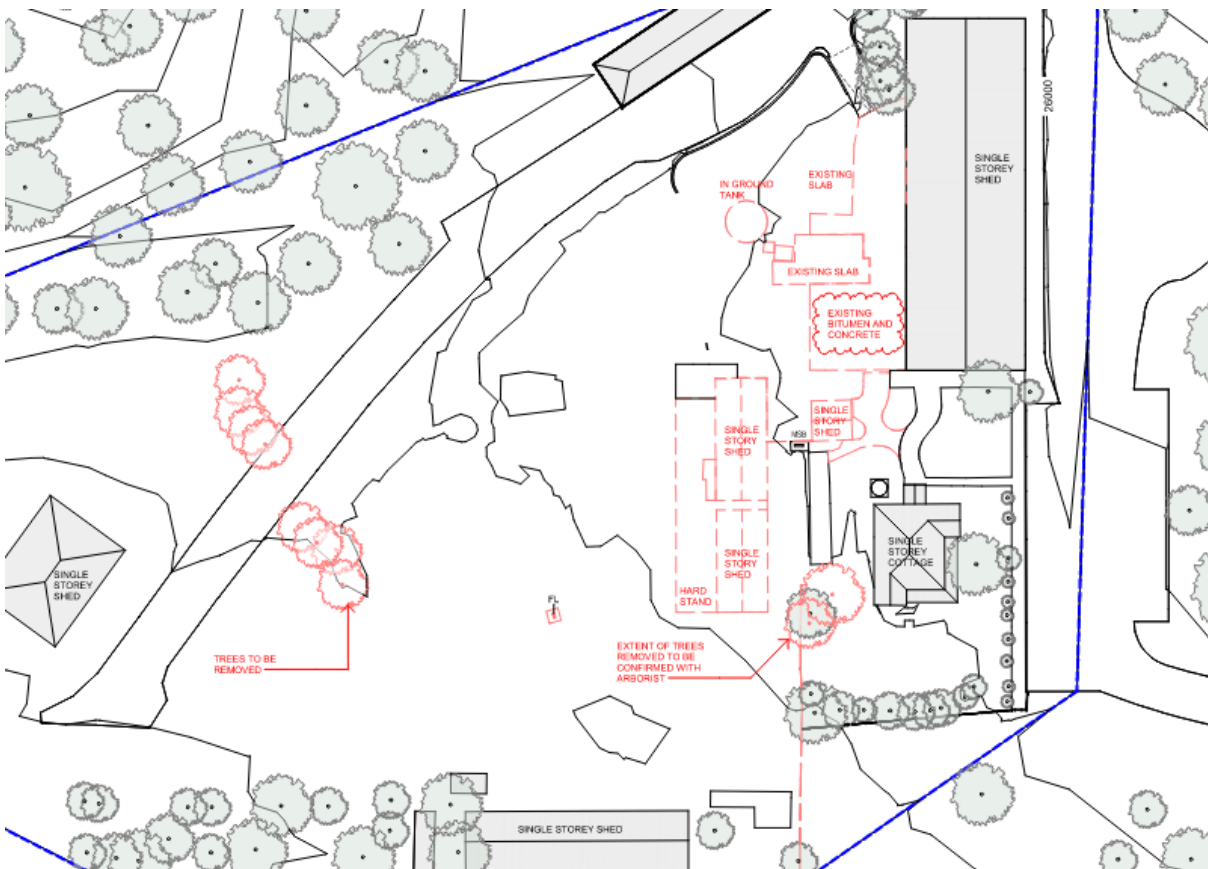


Figure 2 - Demolition plan

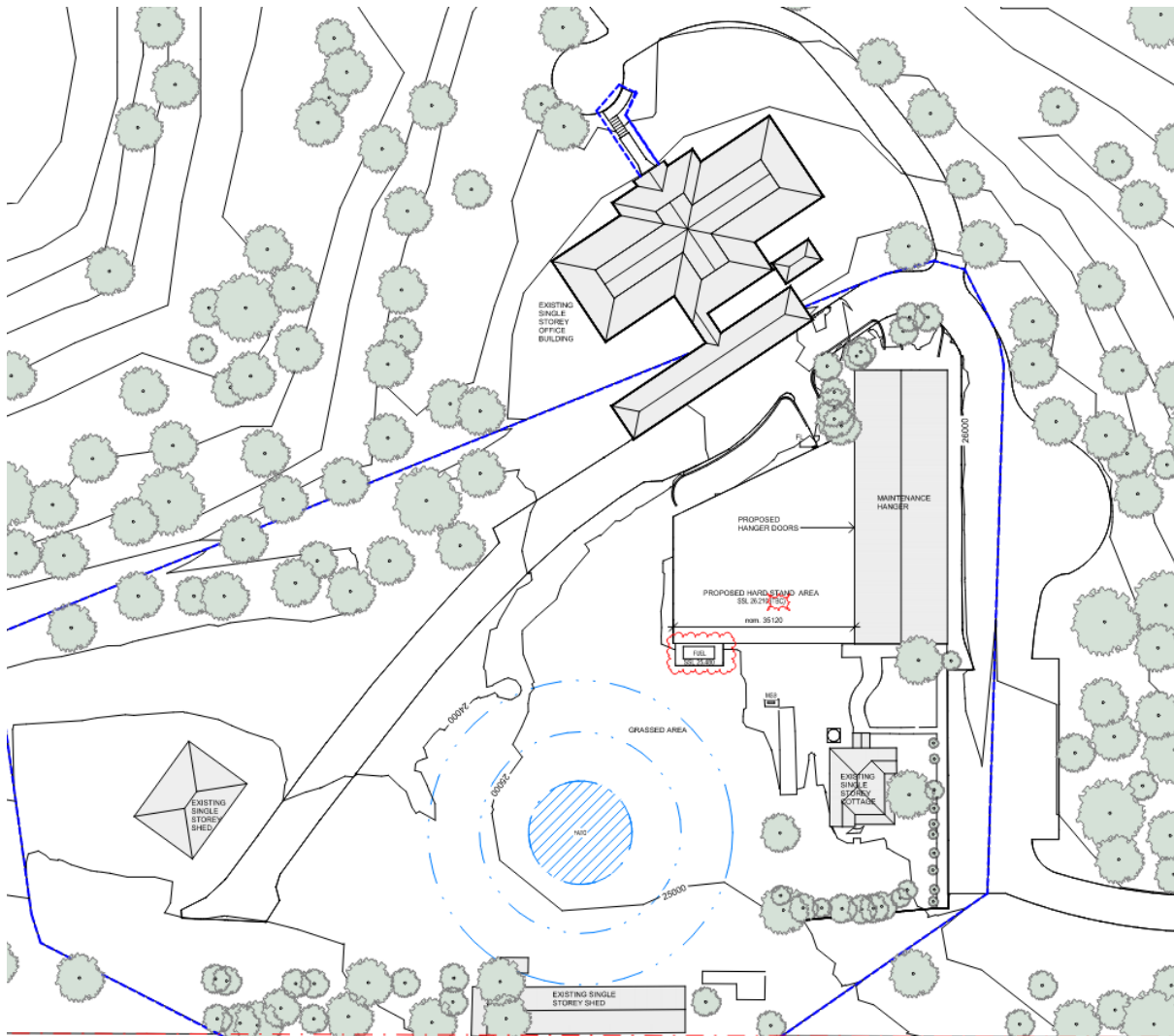


Figure 3 - Site plan

Existing Flood Hazard

The existing flood behaviour has been studied as part of the Nepean River Flood Study (Advisian, 2018). Flood extents for selected events are presented overleaf in Figure 4 to Figure 7 and flood levels have been estimated below in Table 1.

Table 1 – Peak flood levels

Event	m AHD	Site Inundation	Development Affected
1% AEP	22.0	Partial	No
1 in 500 AEP	24.0	Partial	No
1 in 1000 AEP	26.0	Majority	Yes
PMF	29.0	Complete	Yes

This shows the development is unaffected up to the 1 in 500 AEP flood event. The site becomes almost completely submerged in the 1 in 1000 AEP event and is subject to extreme high hazard flooding in the PMF.

Existing Flood Emergency Response

The site is a low flood island and will require evacuation prior to very rare to extreme flooding. Evacuation procedures involve vehicular evacuation by Castlereagh Road and the Great Western Highway. The emergency response procedure is documented in the Hawkesbury-Nepean Flood Emergency Sub plan (SES, 2020)

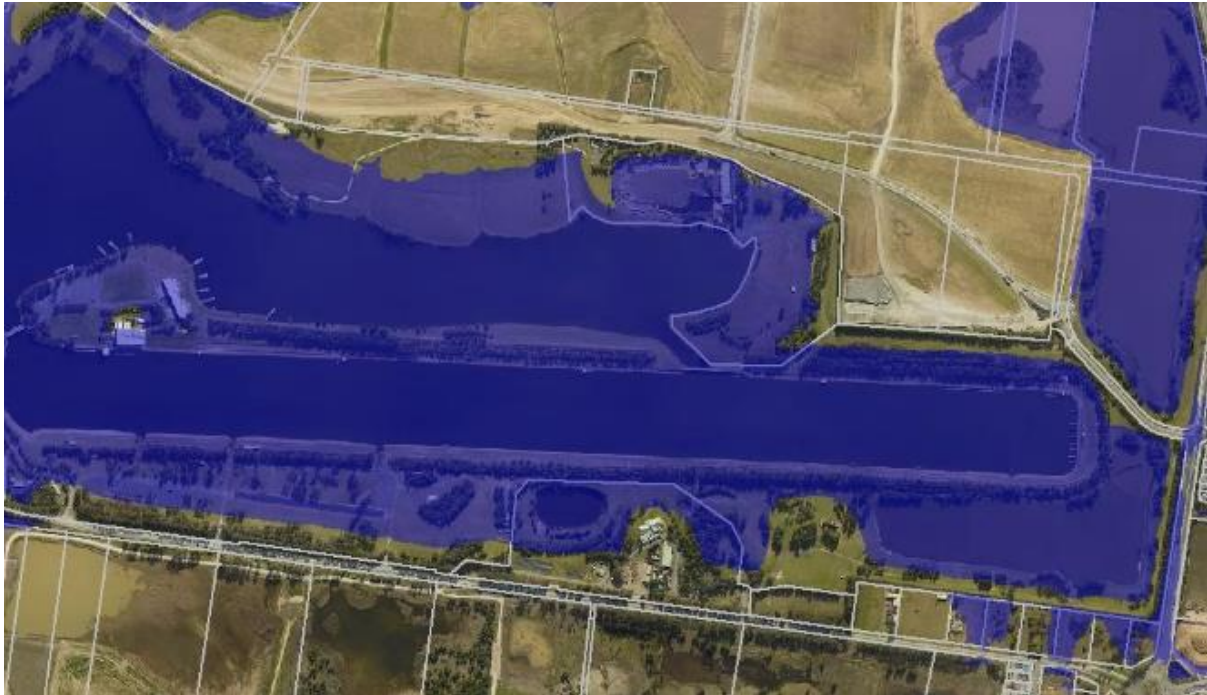


Figure 4 - 1% AEP Flood Extents

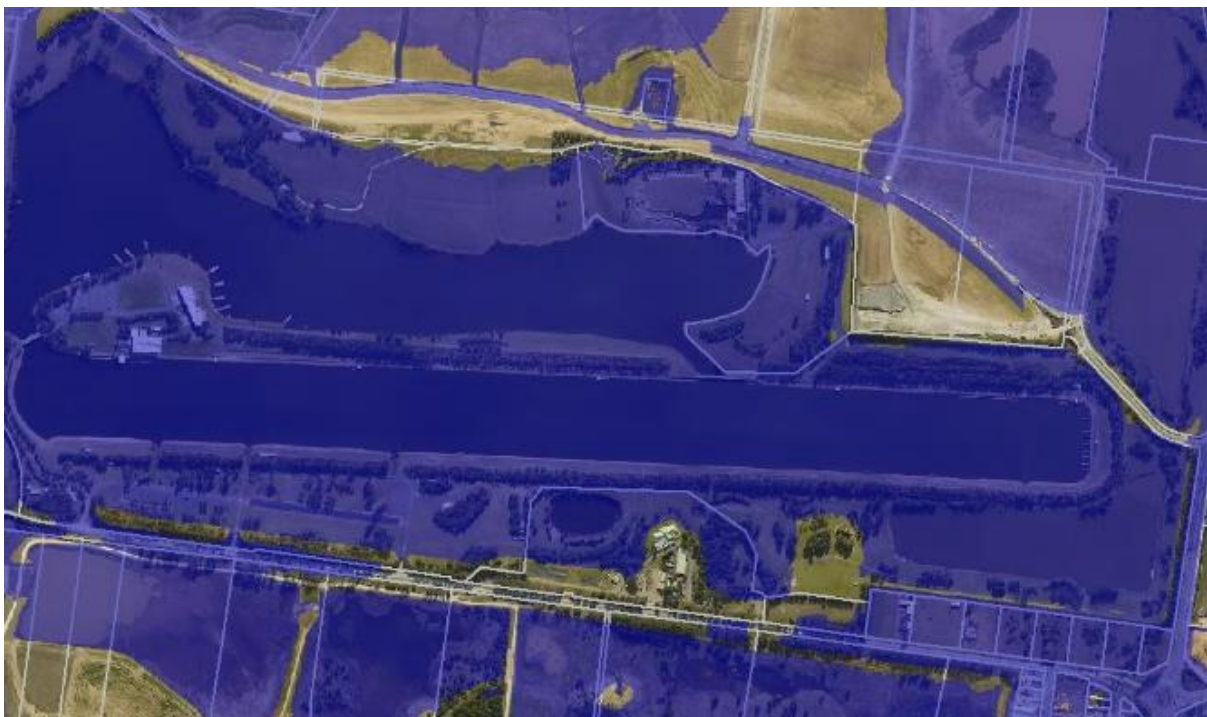


Figure 5 - 1 in 500 AEP Flood Extents

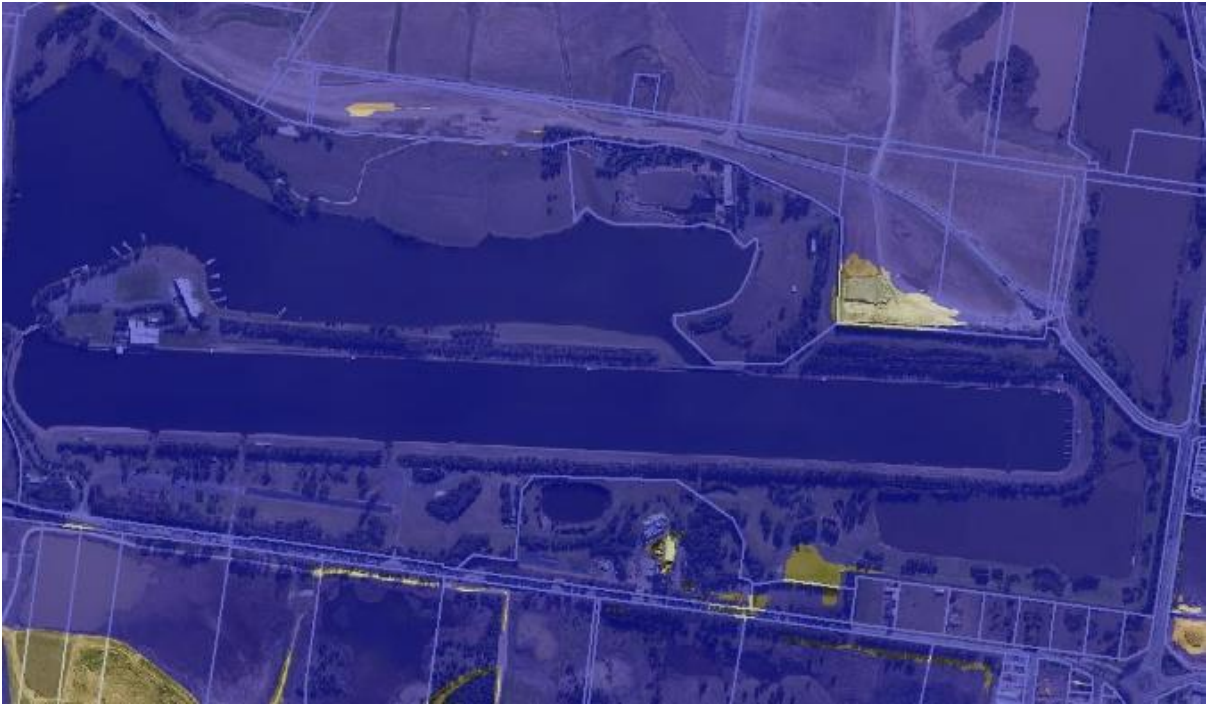


Figure 6 - 1 in 1000 AEP Flood Extents

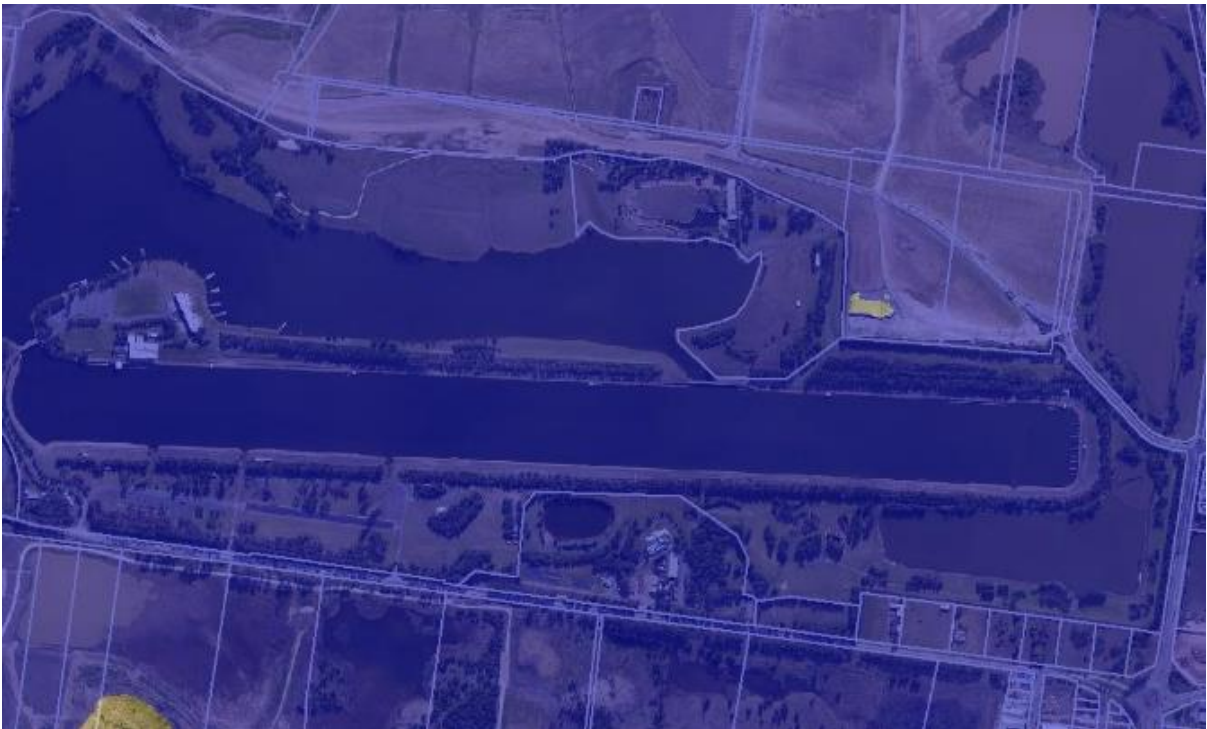


Figure 7 - PMF Extents

Response to SEARs

A response to the SEARs is presented as a summary in Table 2 below.

Table 2 – SEARs Response

Item	Response
Flood hazard	The flood hazard is outlined above in the Existing Flood Hazard section. The proposed development is not directly affected by flooding in frequent or rare flood events and becomes directly affected by the flood hazard in the 1 in 1000 AEP flood event. It is exposed to extreme high hazard flooding in the PMF which represents a theoretical event with an extremely low likelihood of occurrence.
Impact of flooding on the proposed development	The works are located above the 1% AEP plus freeboard which contributes to mitigating the risk to property. Pollutants such as fuel will also be stored above this level. Access to the development may be cut in more frequent events and this will be managed by the existing evacuation procedure for this area. This contributes to mitigating the risk to life.
The development's impact on flood behaviour	Only minor earthworks are proposed as part of the development, with hardstand replacing several existing structures on site. There is therefore minimal change to both impervious fraction and topography. There is expected to be negligible change to flood behaviour due to the development.
Impact of egress and safety in a flood event	There are existing improvements on-site which indicates an existing population to be evacuated. The proposed development is unlikely to significantly increase this population, particularly in the event of predicted inclement weather due to the nature of the activities. Existing evacuation procedures are compatible with the proposed development and there is unlikely to be any impact on egress and safety in a flood event compared to existing conditions.
Impact to flooding in the catchment with consideration of the Hawkesbury – Nepean Valley Flood Risk Management Strategy	<p>The above items demonstrate the development is unlikely to be inappropriately affected by flooding or have a detrimental impact on flooding elsewhere.</p> <p>Consideration has been given to the Hawkesbury – Nepean Valley Flood Risk Management Strategy. It is considered the development is consistent with that strategy with respect to evacuation methodology.</p>

Conclusions

From this assessment the following was determined that the proposed development.

- Will be subject to flooding in very rare to extreme events.
- Is located above the 1% AEP plus freeboard which is commonly considered to adequately manage the risk to property.
- Will store potential pollutants including fuel above this level.
- Will be consistent with The Hawkesbury-Nepean Valley Flood Risk Management Strategy insofar as evacuation will be directed by the SES at predetermined trigger values via Castlereagh Road and the Great Western Highway.
- Will not have any impacts on regional flood behaviour in the 1% AEP due to its extents.
- Is unlikely to have a significant impact on regional flood behaviour in all flood events due to the minor extent of earthworks and removal of existing structures.
- Addresses the SEARs.

We commend our findings for review. If you have any queries, please feel free to contact the undersigned on (02) 4943 1777 to discuss.



Angus Brien

Principal | Group Manager | Civil Engineer
BEng (Civil) (Hons) MIEAust CPEng NER RPEQ
Member SIA FMA

Limitation Statement

Northrop Consulting Engineers Pty Ltd (Northrop) has been retained to prepare this report based on specific instructions, scope of work and purpose pursuant to a contract with its client. It has been prepared in accordance with the usual care and thoroughness of the consulting profession for the use by Heliport Developers P/L. The report is based on generally accepted practices and standards applicable to the scope of work at the time it was prepared. No other warranty, express or implied, is made as to the professional advice included in this report.

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Document Register

Rev	Status	Prepared	Approved	Date
1	Draft	GB	GB	24 September 2021
A	Final	GB	GB	11 October 2021