

NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK

PROTECTING STRATEGICALLY IMPORTANT HELICOPTER LANDING SITES

REVISION DATE	VERSION NUMBER	CHANGES MADE	APPROVED BY

For the purposes of this document, a Helicopter Landing Site (HLS) is an area (not located on an aerodrome) wholly or partly used for the arrival or departure of helicopters.

Purpose of guideline

1. This document provides guidance to State/Territory and local government decision makers as well as operators of strategically important Helicopter Landing Sites (HLS) to ensure:
 - a. the ongoing operation of those HLS;
 - b. the use of those HLS are not compromised by any proposed development encroaching into flight paths;
 - c. new development does not present a hazard to helicopters arriving or departing from those HLS; and
 - d. any new HLS are appropriately located.
2. This guideline is also designed to address the following matters:
 - a. lighting that either distracts or causes interference with night operations;
 - b. noise relating to helicopters;
 - c. wildlife strikes; and
 - d. windshear or air turbulence, where this could affect the normal flight of helicopters operating from these HLS.

Key Considerations

3. Many HLS do not require formal land use planning approval and/or are considered ancillary to existing uses. For example, in some jurisdictions where they are provided as part of a hospital, separate approval is not required. Accordingly, there are many HLS with no regulatory oversight.
4. Not all HLS will require protection from land use planning decisions due to the nature or frequency of use of those sites. However, where a HLS is identified as being of strategic importance these sites must be protected from incompatible uses and encroachment into their flight paths. It will be the responsibility of each jurisdiction to consult with the Civil Aviation

Safety Authority (CASA) and the asset owner to identify those HLS that are considered to be of strategic importance or those that are to be protected in the interest of public safety. Strategically important HLS to protect should include:

- a. a HLS associated with a hospital; or
- b. an elevated HLS, located within a populated area; or
- c. a HLS subject to instrument flight procedures; or
- d. any other facility identified as strategic by States or Territories governments.

It is anticipated that new elevated HLS located within populated areas and HLS subject to instrument flight procedures will require certification by CASA, once their new standards are released.

5. Each responsible planning authority is encouraged to consult with the relevant HLS asset owner to establish protocols for the referral process within their jurisdiction including:
 - a. material to be provided as part of the referral;
 - b. the timeframes in which advice is required to be provided; and
 - c. the format of any advice provided and the wording of appropriate conditions that can be applied to mitigate any impacts. This should include standard conditions that can be applied in the event that the asset owner is unable to respond within the required assessment timeframes.

Why it is important

6. The helicopter industry is one of the fastest growing and diverse segments of the aviation industry.
7. Safety, viability and efficient operation of aircraft at a HLS can be compromised by development including permanent buildings and temporary structures (including cranes), as well as landscape features (such as trees). In recent times, there have been incidents where hospital emergency helipads have been decommissioned due to safety concerns arising from the nearby operation of construction cranes. Elsewhere a fatal accident occurred when a helicopter experienced building induced windshear just after take-off and crashed into a nearby river. Noise generated by helicopters in flight is also a significant issue.
8. In Australia, HLS are not licensed, certified or regulated in the way that aerodromes are under Part 139 of the Civil Aviation Safety Regulations 1998 (CASR). The *Airports Act 1996* makes no specific reference to the use of HLS. For facilities not located on Commonwealth land there are varying levels of regulation and guidance around safeguarding non-airport HLS across the jurisdictions.
9. Population growth, residential densification, and increasing high-rise development in built up areas will continue to increase pressures on airspace protection for HLS. Equally, continued

growth in aviation industry activity will add to the challenges of effective planning for the interaction of aviation operations with development.

10. HLS are critical infrastructure in the provision of emergency medical services and the level of care that can be provided to patients, particularly considering the severity and/or potential instability of the patient's that are being transported by helicopter.
11. If intrusions into the flight paths for a HLS, and risks associated with the use of those HLS, are not regulated, the ongoing helicopter operations at strategically important sites may be compromised. Without protection, development in the vicinity of a HLS could jeopardise safety and efficiency and potentially result in the decommissioning of the HLS.

Roles and responsibilities

12. State/Territory and Local Governments are primarily responsible for land use planning.
13. Despite the importance of maintaining unimpeded flight paths to strategically important HLS, protective legislation varies across jurisdictions.
14. CASA is responsible for federal legislation and regulations relating to airspace management, including helicopters in flight. Airservices Australia is Australia's air navigation provider responsible for managing the airspace in accordance with the regulations.
15. CASA has released operating guidelines for Helicopter Landing Sites, (CAAP 92-2 (2) *Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites*). However, these guidelines do not function as enforceable legislation.
16. Unless a HLS is located on an aerodrome, CASR Part 139 does not apply. Formal responsibility for accepting the suitability of the site is determined by the helicopter pilot in command.
17. CASA is reviewing its standards for HLS to enhance safety and is expected to include the certification of strategically important HLS. This will come under the CASRs. This will require flight paths of certified HLS to be protected to secure their ongoing operations, for example, where associated with emergency medical services.
18. The International Civil Aviation Organization (ICAO) sets out Standards and Recommended Practices (SARPs) for the safe conduct of civil aviation activities. Australia has undertaken to apply the ICAO SARPs, except where specific differences have been notified to ICAO. The following annexes are applicable to helicopter operations:
 - Annex 6: Operation of Aircraft – Part III: International Operations – Helicopters
 - Annex 14 – Aerodromes – Volume II: Heliports
19. Australia has notified ICAO of a difference in the case of CASR Part 139 as the associated Manual of Standards currently only applies to HLS located on aerodromes.
20. Guidance on the design of heliports is contained in ICAO's Heliport manual (Doc No. 9261-AN/903). The incorporation of Annex 6 and 14 into the Australian civil aviation legislation forms part of CASA's current Regulatory Reform Program.

21. CASA has powers under the *Civil Aviation Act 1988* to regulate potential sources of distractions from lighting. Under Regulation 94 of the Civil Aviation Regulations 1988 (CAR 1988), CASA can require lights which may cause confusion, distraction or glare to pilots in the air, to be extinguished or modified.

How it should be used

22. Some jurisdictions, for example Victoria, already have planning guidelines or policies in place and this document provides guidance for any review of those documents. For those jurisdictions without policies in place, this Guideline (in addition to the associated National Airports Safeguarding Framework) will provide assistance in the development of those policies.
23. The relevant planning authorities within each jurisdiction should commence consultation with relevant asset owners and/or CASA to identify strategically important HLS that should be safeguarded in land use planning controls.
24. Once a strategically important HLS is identified, a process is to commence to incorporate a flight path within the land use planning controls. If the flightpath extends over more than one local government boundary, then the requirements will need to be reflected in all relevant land use planning controls. This protection is also to be afforded to the approval of any new strategically important HLS.
25. When planning applications are made for either a new HLS, especially where associated with a hospital, or any development within the flight path or zone of influence of an existing HLS, planning authorities should consider the application against this Guideline and, where triggered, refer the application to the HLS asset owner and the CASA for detailed advice and assessment. The assessment of the application by land use planners should be informed by the advice received through that referral process, including the application of any conditions to mitigate impacts.
26. When undertaking any strategic review of height limits within land use planning controls, the maximum height limit specified should not extend into any flight path for a strategically important HLS.
27. Nothing in this guideline overrides the need to refer any development to an airport, where it extends into the prescribed airspace of an airport.

GUIDELINES FOR MANAGING INTRUSIONS AND ACTIVITIES IN THE FLIGHT PATHS OF STRATEGICALLY IMPORTANT HLS

28. The flight paths to a strategically important HLS need to be protected from intrusions (permanent and temporary) and land use planning activities that could interfere with safe operations of the HLS.
29. The activity that is proposed to be carried out will generally require approval by state or local government authorities. All applications in the vicinity of a strategically important HLS should be reviewed to determine if there is any conflict with the HLS in respect to:
 - a. intrusions into the flight path;
 - b. lighting that may cause distraction;
 - c. lighting installed to illuminate obstructions that is not visible when using night vision goggles;
 - d. wildlife strikes; and
 - e. windshear.

HLS Design Considerations

30. Until such time as new standards are provided by CASA to safeguard HLS, any new HLS should be constructed in accordance with the CAAP 92-2 (2) *Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites*. Exceptions to this are where a suitably qualified and experienced aviation professional has designed and certified the suitability of the HLS, including a survey of the arrival and departure flight paths and transitional surface, which are to be safeguarded from intrusions.

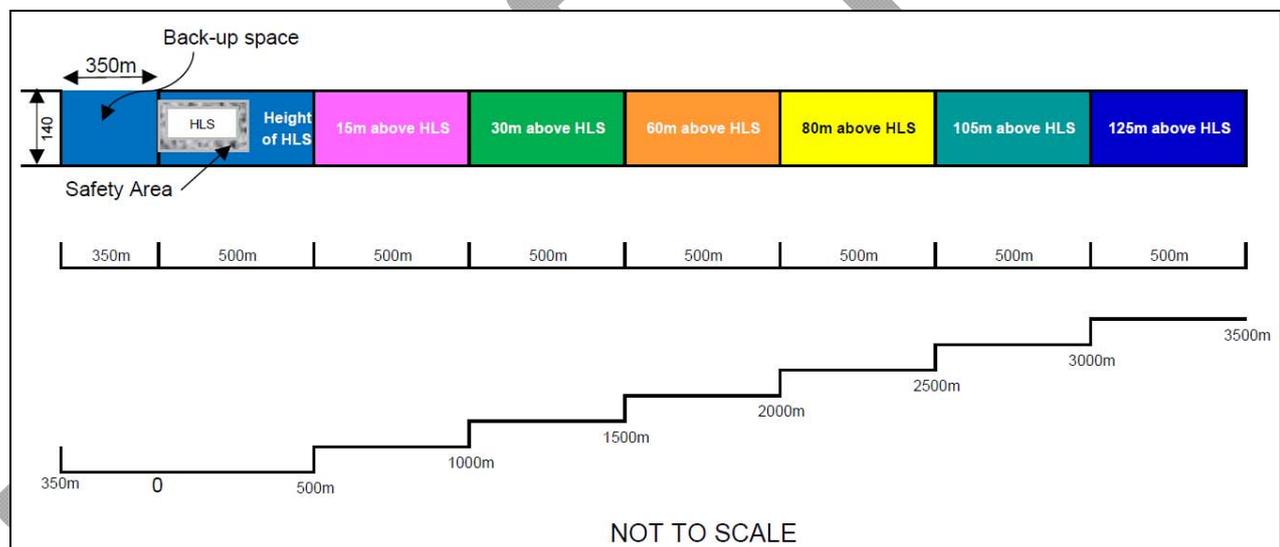
HLS Flight Path

31. An effective and safe helicopter service to support emergency services relies heavily on both the optimal location of the HLS and a clear flight path free from obstruction.
32. There is currently no formal requirement for a HLS to have a declared Obstacle Limitation Surface (OLS), however a recommended OLS is defined in CAAP 92-2(2). When considering the OLS, it is important to remember that there are three design categories based on the class of performance capability for the helicopter. Therefore, when considering the need of the OLS protection, the most limiting of these categories relevant to the use of the HLS needs to be used. Further, any object extending above 110m above existing ground level must be assessed by CASA under CASR Part 139 to determine whether it is an obstacle to aircraft operations, including helicopters.
33. Land use planning authorities and state/territory governments should be aware that all intrusions into the flight path for a HLS have the potential to create aviation safety risks and to limit the scope of operations possible from the HLS.
34. Where development, including temporary structures ancillary to that development (for example, cranes) has the potential to impact upon the safe operation of strategically important HLS, it is important that the relevant helipad owner is notified and has an opportunity to make a meaningful contribution to the outcome of the development proposal through a referral process.

35. Where possible the HLS asset owner should commission a survey of the helicopter flight path by a suitably qualified aviation professional and submit that survey to the relevant planning authority. The relevant planning authority should then safeguard that helicopter flight path through land use planning scheme provisions and assessment considerations.
36. Where the HLS has not been surveyed to identify the flight path (including transitional surfaces) and/or that survey has not been provided to the relevant planning authority, the area to be identified for determining the trigger for land use planning referrals to the HLS asset owner should be in accordance with Figure 1 below. No development should be permitted to exceed the height limits within Figure 1 without the prior approval of the HLS asset owner.

Note: A transitional surface for a HLS is a sloping surface off the side of the flight approach and take off area and the take-off splay. Its purpose is to provide sideways protection for a helicopter when using the flight path and within the flight approach and take off area.

Figure 1 – Referral Trigger for Strategically Important HLS, where HLS has not been surveyed/survey has not been provided



Note:

- 1) Any development that exceeds the heights shown in Figure 1, which is consistent with the highest level of HLS classification (Performance Class 1), must be referred to the asset owner and CASA.
- 2) Figure 1 is to be applied to each flight path (approach and departure) to the HLS. Accordingly, there may be multiple flight paths. The relevant planning authority will have to consult with the HLS asset owner to obtain confirmation of the location of the flight path(s) associated with the HLS and the height of the HLS.
- 3) The methodology incorporates:
 - a. the 3386m length as measured from the safety area boundary for a Performance 1 classification for a HLS and has applied the required 4.5% slope as prescribed in CAAP 92-2(2).

- b. A 350m length as measured from the safety area boundary for the back-up surface of a helicopter. (Note: the actual distance required for a back-up surface varies depending upon the helicopter type and is prescribed in the relevant flight manual for each helicopter).
 - c. The maximum width incorporates the approach and take-off climb surface and the transitional surface for the AW139 helicopter. The width, has been determined using the formula for night time operations within CAAP 92-2(2) which is 10 x the rotor diameter (13.8m for the AW139 helicopter), which equates to 138 metres, and then rounded to the nearest number.
- 4) In the event that a development also encroaches into the OLS for an airport, then the relevant referral and approval processes in association with that airspace is also still required to be undertaken (in addition to the processes identified within this guideline).
37. Planning authorities should also include the use of the land in considering potential encroachments into the flight path. For example, whilst a public park might be appropriate within the flight path, uses in that public park may result in encroachments into the flight path. For a public park, this could include circus tents, ferris wheels and the flying of drones.

Cranes

38. Any development proposal located within/beneath the flight path to a HLS must be required to indicate:
- a. whether a crane is to be erected during the construction of that development;
 - b. the maximum height of the crane;
 - c. the height of the crane with the jib stowed when not in operation; and
 - d. the period in which the crane is anticipated to remain on site.
39. Regardless of whether the proposed development extends into the flight path, if the crane to be used during construction is anticipated to extend into the flight path, the application must be referred to CASA and the HLS asset owner. Advice received during that referral must be taken into consideration in the assessment of the application.
40. Due to the number of incidents with cranes encroaching into flight paths, planning authorities are encouraged, unless an encroachment is approved in association with the application, to place a condition or provide an advisory note on relevant approvals within flight paths to a HLS, prescribing that no crane is permitted to extend into the flight path for the HLS.

Trees

41. Natural features, including trees, can cause obstructions into the flight path of a HLS. Any development proposed within the flight path to a HLS, must ensure any landscape plan approved in association with that development does not incorporate species that have the ability to extend into the flight path when they grow to maturity.
42. The relevant planning authority for each jurisdiction could prepare a list of landscape species that are suitable within that area based on the trees height at maturity and could condition any

approvals (either in the flight path or on the site containing the HLS) to ensure compliance with that species list.

43. Any landscape species list prepared should not include species that attract wildlife. This will assist in reducing the likelihood of those incidents occurring within the flight path.

Lighting

44. Where a HLS is to be used in association with night time operations, all lighting is to comply with CAAP 92-2 (2) *Guidelines for the Establishment and Operation of Onshore Helicopter Landing Sites*, except where certified by a suitably qualified and experienced aviation professional.
45. Lighting erected onto any obstruction (building or crane, for example) within the flight path or above 110 metres in height (whether it is located within a flight path or not), must be able to be detected by Night Vision Goggles (or equivalent). It is understood that lighting that is red in colour and of low intensity steady light is preferable. Additionally, any buildings, cranes, etc above 110 metres in height (regardless of their location) must be referred to CASA as part of the assessment process.
46. At night, and in periods of poor visibility during the day pilots rely on the particular pattern of the aeronautical ground lighting to assist in aligning themselves with the correct touchdown point. It is therefore important that lighting in the vicinity of the HLS is not configured or is of such a pattern that pilots could either be distracted or mistake such lighting as being ground lighting from the HLS.
47. When planning applications are made that involve significant lighting within proximity to a HLS, planning authorities should refer those applications to CASA for detailed advice and assessment. Proponents should contact CASA for advice on the likely effect on aircraft operations of proposed lighting in the vicinity of a HLS.
48. Coloured lights are likely to cause conflict irrespective of their intensity as coloured lights are used to identify different HLS facilities. Proposals for coloured lights should be referred to CASA for detailed guidance.
49. CASA has advised that glare from buildings tend to be momentary and, therefore, unlikely to be a source of risk. Further, it is anticipated that when operating helicopters in bright sunlight, pilots would either wear helmets with integrated visors that provide glare protection or sunglasses.

Noise

50. Nationally, all helicopters are required to be certified to international noise standards which are implemented through the *Air Navigation (Aircraft Noise) Regulations 1984* (the Noise Regulations). These international standards apply to the design of aircraft (including helicopters), and specify the amount of noise that may be emitted by a particular aircraft type/model. The Regulations do not prescribe how an aircraft is to be operated in relation to height or frequency of flights.

51. The frequency of flight movements and hours of operations are key factors that contribute to the noise impact that a HLS will have on nearby sensitive uses. Where possible, the siting and design of a new HLS should give consideration to the minimisation of impacts on neighbouring areas from noise associated with the operation of aircraft at a HLS.
52. Australian Standard 2363:1999 *Acoustics – Measurement of noise from helicopter operations* provides methods for the measurement of noise from existing and proposed HLS and helicopter overflights. This standard provides technical guidance for local planners, government agencies and operators in calculating the acoustic environment near existing and proposed HLS or flight paths as a result of helicopter operations.
53. Noise abatement procedures offer potential reductions in noise impacts on the ground. The implementation of noise optimised procedures has been facilitated via guidance material published by Helicopter Association International (HAI).
54. A Fly Neighbourly Advice (FNA) is a voluntary code of practice that can be established between some aircraft operators and communities or authorities that have an interest in reducing the disturbance caused by aircraft within a particular area. An FNA may recommend limitations on operating heights, the frequency of operations and the areas of operations. An FNA however, is not enforceable under aviation law and mandatory operating and safety procedures will take precedent. A decision to establish a FNA, is normally taken by a government authority, a business operator or a community group that is materially affected by the operation of aircraft. A FNA should acknowledge the necessity for police, fire, search and rescue and other emergency services and infrastructure monitoring organisations to have access to low level airspace as the need arises.
55. Any noise complaints in association with helicopter operations are to be directed to Airservices Australia.

Windshear and Turbulence

56. Air flow disturbances around and over buildings, stands of trees, thermal building effects and other environmental factors can create hazardous turbulence and wind shear in the vicinity of a HLS thus affecting the safe operation of aircraft into and out of the facility.
57. Any proposed HLS should take into consideration the impact of windshear and turbulence in determining its suitability. Any new HLS should be provided with a wind indicator measuring 2.4m in length and visible to the pilot during take-off approach and landing. For complex HLS sites, more than one indicator should be provided to ensure pilots receive sufficient information on the wind flow over the site. For any HLS capable for use for night operations, the wind indicator(s) should be lit. The wind sock should be located outside of the Safety Area and should not penetrate the flight path or the transitional surface.
58. Where turbulence issues are anticipated for a HLS, these could be communicated by asset owners to pilots through an En Route Supplement Australia (ERSA) notification. This is a document updated by Airservices Australia every 12 weeks to notify pilots of vital information for planning a flight and when in flight.

Wildlife Strikes

59. Wildlife strikes are a significant safety risk for pilots as well as an economic risk for operators. Species, numbers, time of day, migratory patterns, flocking patterns, habitat types and breeding activities occurring in the vicinity of HLS contribute to the level of risk.
60. Data supplied by the Australian Transport Safety Bureau indicates that there were 43 recorded wildlife strike incidents for helicopters between 2007 and 2015 (inclusive). 14 of those were in proximity to a hospital HLS.
61. 74% of all strikes and 66% of strikes causing substantial damage occur at 500 feet.¹
62. The International Civil Aviation Organisation (ICAO) has developed specific advice on land uses with the potential to become high risk wildlife attractants. These include:
 - a. Food garbage disposal;
 - b. Sewage treatment and disposal;
 - c. Artificial and natural lakes;
 - d. Abattoirs and freezing works;
 - e. Fish processing plants;
 - f. Bird sanctuaries, and
 - g. Outdoor theatres.
63. HLS asset owners should work with the relevant planning authority to establish mechanisms that will identify and restrict land uses that would cause hazardous wildlife attraction or activity at or across the HLS and/or its flight paths. HLS asset owners should refer to Guideline C – *Managing the Risk of Wildlife Strikes in the Vicinity of Airports*. Whilst it is acknowledged that Guideline C has been specifically written for airports, its application also has relevance to HLS.
64. Where located within 10 kilometres of a strategically important HLS, any proposed uses identified within Attachment 1 of Guideline C - *Managing the Risk of Wildlife Strikes in the Vicinity of Airports*, should be referred to the asset owner as part of the assessment process. Any comments provided by the asset owner should be taken into consideration in the assessment of that application.
65. When siting and/or assessing new HLS consideration should be given to uses within 5.5 kilometres, to determine the suitability of that site in relation to wildlife strikes.
66. CASA Advisory Circular 139-26(0) provides guidance on wildlife hazard management at aerodromes. At present there is no specific information in this guideline that relates to wildlife strike risk management for HLS.

¹ Dolbeer R, 2006. JOURNAL OF WILDLIFE MANAGEMENT 70(5):1345–1350.

Background Material

Victoria

Victoria is the only State at present to have hospital based HLS flight paths protected through land use planning instruments. In Victoria an overlay identifies the surveyed area below the flight paths. Development above a certain height within the flight paths is required to be referred to the referral authority and Councils are obligated to follow the advice from the referral authority.

UK

Advice from the UK Civil Aviation Authority (CAA) indicates that they have regulatory oversight of licenced/certified aerodromes and heliports and their protected safeguarding zones, where they hold a UK license or EASA certificate. As there are many sites that are not licenced or certified (and don't need to be, there is either no knowledge or regulatory oversight for those sites).

The one aerodrome dedicated to helicopter operations over which the CAA do have oversight does have in place informal safeguarding arrangements where they are notified of tall structures in close proximity to their heliport. Due to an accident when a helicopter collided with a crane positioned close to the heliport, the UK Government has now agreed to formalise safeguarding arrangements to ensure a more robust notification system is in place. They are currently in the process of liaising with Government to agree to the final shape and design of that zone. They are aiming to protect the recognised Take off Climb/Approach funnel surfaces (Annex 14 Vol II) within 4.5km radius of the heliport.

They previously licenced another heliport (Penzance Heliport) which was safeguarded by directing planning authorities to consult with the heliport. This was enacted by lodging a safeguarding map with each planning authority. Whenever a development (triggered by height) was proposed within close proximity to Penzance Heliport, they had an obligation to consult with the heliport owners. The map also included a radius of approximately 3km from the heliport where all applications likely to attract birds required consultation.

Recommended Dimensions and Slopes of Obstacle Limitation Surfaces for Secondary HLS Visual FATOs

SURFACE and DIMENSIONS	SLOPE DESIGN CATEGORIES		
	A	B	C
APPROACH and TAKE-OFF CLIMB SURFACE:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Clearway boundary if provided)	Safety area boundary	Safety area boundary
Divergence: (1st and 2nd section)			
Day use only	10%	10%	10%
Night use	15%	15%	15%
First Section:			
Length	3 386 m	245 m	1 220 m
Slope	4.5% (1:22.2)	8% (1:12.5)	12.5% (1:8)
Outer Width	(b)	N/A	(b)
Second Section:			
Length	N/A	830 m	N/A
Slope	N/A	16% (1:6.25)	N/A
Outer Width	N/A	(b)	N/A
Total Length from inner edge (a)	3 386 m	1 075 m	1 220 m
Transitional Surface: (FATOs with a PinS approach procedure with a VSS)			
Slope	50% (1:2)	50% (1:2)	50% (1:2)
Height	45 m	45 m	45 m

Figure 3 – Recommended dimensions and slopes of obstacle limitation surfaces for secondary HLS visual FATOs

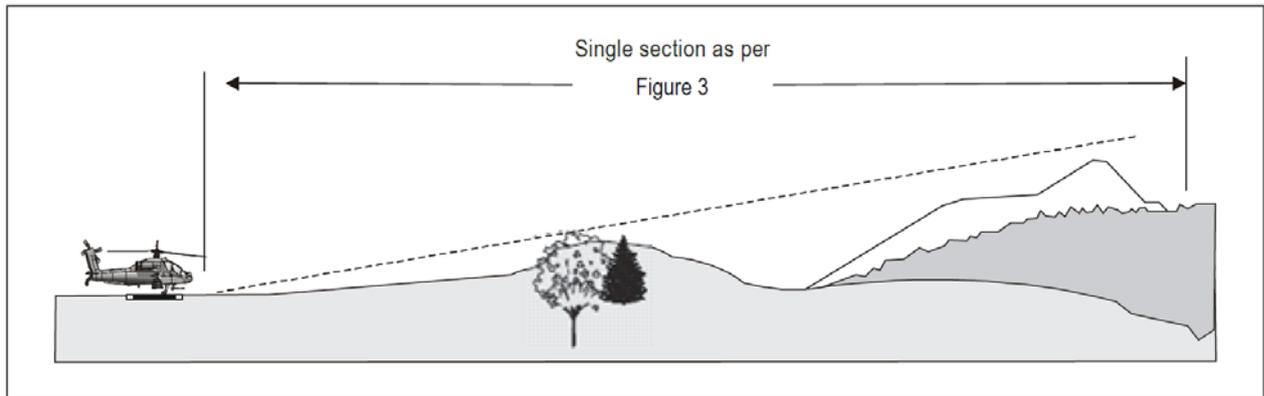
Note:

(a) The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, brings the helicopter to 152 m (500 ft) above FATO elevation.

(b) Seven rotor diameters overall width for day operations or 10 rotor diameters overall width for night operations.

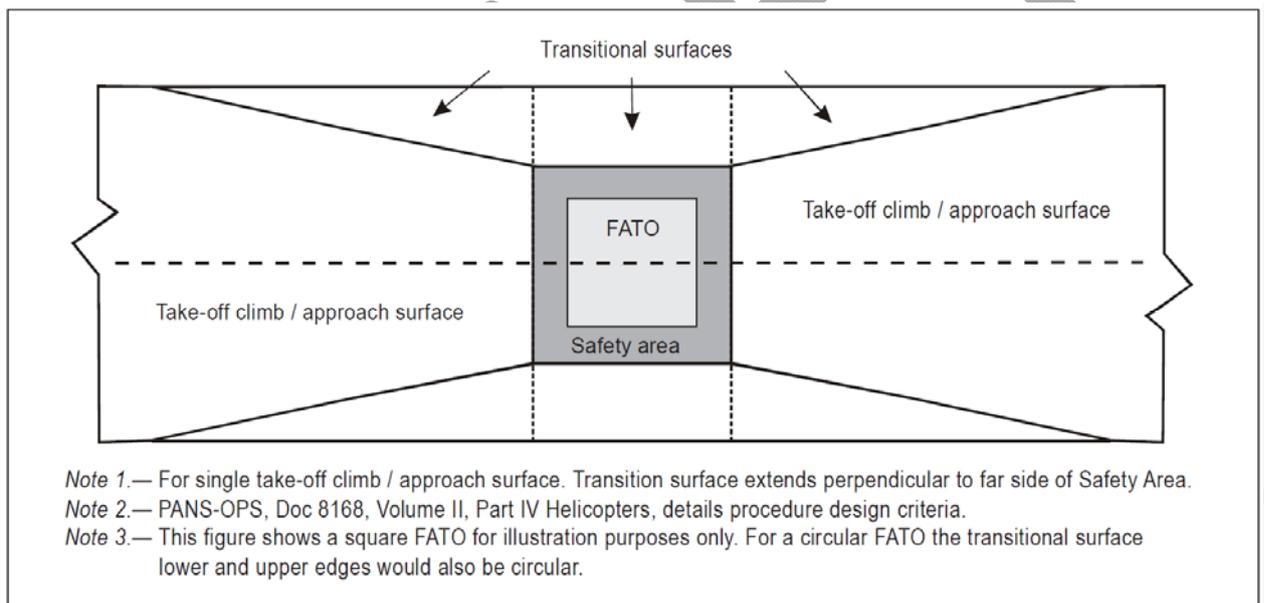
(Source: Civil Aviation Safety Authority (2014), CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites, page 12.)

Approach and Take-off Surfaces – “A” slope profile – 4.5% design



(Source: Civil Aviation Safety Authority (2014), *CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites*, page 13.)

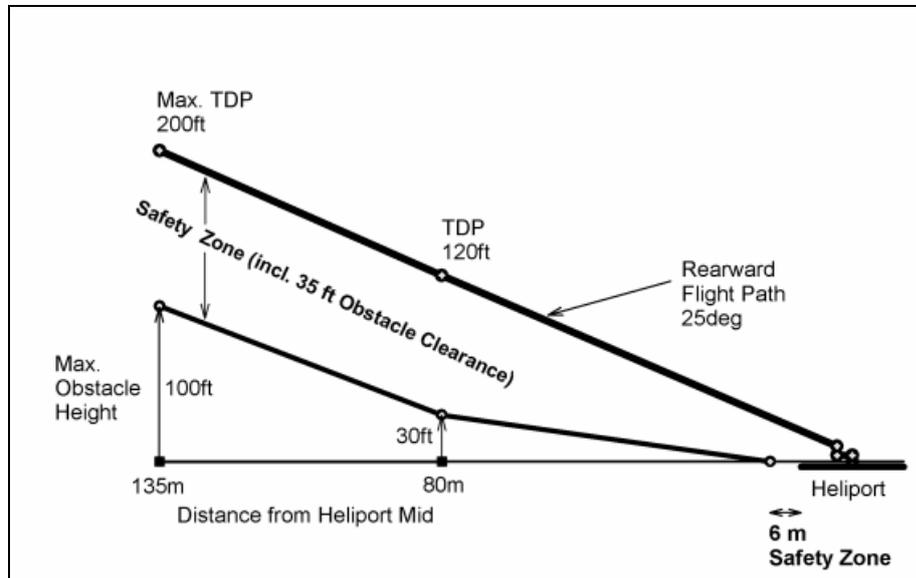
Transitional Surface for a FATO with a Point-in-Space (PinS) approach procedure with a VSS



(Source: Civil Aviation Safety Authority (2014), *CAAP 92-2(2) Guidelines for the establishment and operation of onshore Helicopter Landing Sites*, page 15.)

Back up Profile for the Airbus H135 Helicopter

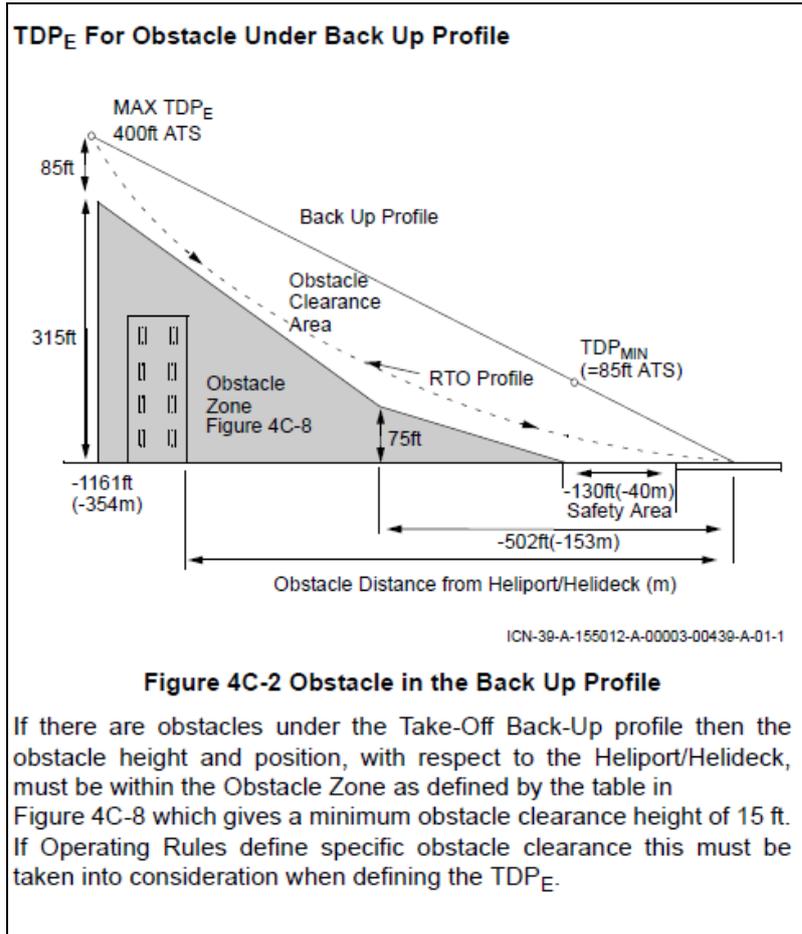
Cat. A VTOL Rearward Flight Path Surface Level Heliport Obstacle Clearance for H135.



(Source: Eurocopter (now Airbus Helicopters) 'Figure C23 Rearward Flight Path (VTOL)', *Flight Manual EC 135 P2+ Rev.10*)

DRAFT

Back Up Profile for Augusta Westland AW 139 Helicopter



(Source: Augusta Westland 'TDP_E For Obstacle Under Back Up Profile', AW139 Rotorcraft Flight Manual)