Helicopter Site Keepers

A Guidelines Document produced and updated with the assistance of the Civil Aviation Authority

1. Legislation

1.1 Civil helicopter operations are governed by The Air Navigation Order 2005 (S.I. 2005 No 2005/1970) and The Rules of the Air Regulations 1996 (S.I. 1996 No 1393) as amended. See also Section 7 - Joint Aviation Authority and JAR-OPS 3.

1.2 The Civil Aviation Authority (CAA) is the organisation to whom the responsibility for regulation of civil air operations is given by the Civil Aviation Act 1982. Within the Civil Aviation Authority's Safety Regulation Group (SRG) the Flight Operations Inspectorate is tasked with overseeing Public Transport operations, whilst The General Aviation Department monitors private and recreational activities, and the Aerodrome Standards department oversees the standards and operations of Licensed heliports

1.3 Provided the intended helicopter landing site is not within a congested area (**an area in relation to a city, town or settlement which is substantially used for residential, industrial, commercial or recreational purposes)** or close to an open air assembly of 1000 or more people it is only necessary for the landowner to grant permission to the helicopter operator to use the site (see also 5.1). If the site lies within a congested area or close to an assembly, it is the responsibility of the helicopter operator to apply to the CAA for a permission to land and take-off or over fly below 1000 feet in accordance with the Rules of the Air Regulations, specifically Rule 5, which covers the subject of low flying in detail. A condition of these permissions is that the operator has the agreement, in writing, of the landowner and/or assembly organiser as appropriate to land and take-off at the site and that the local police are informed. The permission is generally confined to an area within 1 Km of the landing site.

1.4 Rule 5(2)(a) requires that a helicopter shall not fly below such height as would enable it to alight without danger to persons or property on the surface, in the event of failure of a power unit. This rule applies at all times, for all types of helicopter. Clearly its effect is to restrict flights by single engine helicopters much more than for twin-engine helicopters.

1.5 ANO Article 73 states that a person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or person therein. This article affects everybody. Article 74 further states that a person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property. This generally is taken to mean the pilot of the helicopter.

1.6 Responsibility for the safety of all helicopter-flying operations lies wholly with the helicopter operator. Additionally, at night for Public Transport passenger flights, whenever a helicopter is taking-off or landing, the person in charge of any area in the United Kingdom intended to be used for the taking-off or landing of helicopters, other than at licensed aerodromes or government owned aerodromes, is responsible under Article 126(4) of The ANO for causing to be in operation such lighting as will enable the pilot of the helicopter:

(i) in the case of landing, to identify the landing area in flight, to determine the landing direction and to make a safe approach and landing; and

(ii) in the case of taking off, to make a safe take off.

A helicopter flying for the purpose of the public transport of passengers at night shall not land at such a site unless there is in operation such lighting. Privately operated helicopters, although not bound by law to conform, are nevertheless advised to exercise caution when using unlicensed sites at night. It is recommended that operators adopt the same standards as for public transport operations.

1.7 Helicopters operated by HM Forces operate under Ministry of Defence regulations and not to ANO or Rules of the Air Regulations. In general terms they are operated to different standards, especially with regard to performance requirements, which may permit military helicopters to fly into sites which would be unacceptable to civil operators. The CAA has no jurisdiction over the operation of military aircraft. Enquiries concerning the operation of military helicopters should be directed to the Ministry of Defence.

1.8 Helicopters on the British civil register need to conform to European Aviation Safety Agency (EASA) Regulations in particular Commission Regulation (EC) No 1702/2003 Annex Part 21 and Certification Specifications CS-27 and CS-29. These lay down the requirement to demonstrate a mandatory take-off technique for single engine helicopters (Group B/Class3) which, in the event of failure of a power unit at any point during the take-off manoeuvre, does not involve hazard to the occupants of the helicopter. Public Transport flights are expected to operate in conformity with the techniques detailed in the aircraft flight manual to ensure passenger safety. It is recommended that operators of non-public transport flights also avoid hazard to the occupants by using only approved, safe techniques.

1.9 For multi engine helicopters operating to Group A/Class 1 performance the Certification Specifications are more stringent, in that in the event of an engine failure at any point up to the decision point*, a re-landing can be made which does not involve damage to the helicopter or hazard to the occupants. Alternatively, the take-off can be continued with one engine inoperative. This requirement makes these helicopters more suitable for flights within congested areas.

***Group A/Class 1 helicopters, on take off or landing, are required, in the event of failure of a power unit, to be capable of rejecting safely onto the take off/landing area available or of flying away on the remaining power unit(s) avoiding all obstacles by a vertical margin of 35 feet.**

1.10 These airworthiness demands, taken in conjunction with the legislation outlined above, means that careful consideration needs to be given to the selection of helicopter landing sites by both operators and persons in charge of sites. Operators who hold Air Operator's Certificates have instructions in their Operations Manuals concerning the selection and management of all helicopter-operating sites. Site keepers, especially if they know little about helicopter operations, do not readily have access to guidance. This document is intended to provide that guidance for them, but is not intended to be fully comprehensive. Prospective Site Keepers should consult with helicopter operators who have access to the performance requirements for the helicopter in the relevant section of the flight manual.

2. International Standards and Recommended Practices

2.1 The International Civil Aviation Organisation (ICAO) is the body which is responsible for compiling and disseminating information concerning standards and recommended practices. Contracting States are required to notify the Organisation of any differences between their national regulations and practices and those laid down in ICAO documents. The United Kingdom is one of the Contracting States and has notified no differences to the internationally recommended standards and practices for heliports, helipads or helidecks, either at ground level or elevated. These are described in detail in ICAO Annex 14 Volume II Heliports and in the ICAO Heliport Manual. However, it should be borne in mind that these ICAO standards and recommended practices are presently the subject of a major review by Contracting States and industry bodies. UK CAA and industry anticipates that the standards and recommended practices for ground level and elevated heliports are likely to evolve significantly to

take full account of the operational flexibility afforded to Rotary Wing aircraft. (NB: ICAO publications are available on application to Airplan Flight Equipment, 1a Ringway Trading Estate, Shadowmoss Road, Manchester M22 5LH – Telephone 0161 499 0023)

2.2 The above documents are intended to provide detailed guidance for the location, construction, marking and lighting of heliports etc. In the UK helicopters are required to operate from licensed sites only if they are conducting scheduled services or if they are being used for ab initio pilot training. An example of a scheduled helicopter service is the Penzance - Scillies service operated by British International. All other flights, apart from training flights, do not attract the legal requirement to operate from licensed heliports.

2.3 For certain helicopter 'special events' which attract large numbers of movements, (a take-off **or** a landing is one movement) estimated at over 100 per day, it is recommended that consideration is given to applying to the CAA (Aerodrome Standards Department) for a temporary aerodrome licence. This ensures that safety arrangements at the site are appropriate to the anticipated level of activity. Other sites used in conjunction with special events at which a lower number of movements are anticipated, even when not requiring a licence, should nevertheless be notified to the CAA and may be inspected on the day of the event by Flight Operations Inspectors. Whether licensed or not, sites should only be selected which take full account of the performance requirements of all helicopter types likely to operate the site.

2.4 Helicopters are, by design, able to use non-conventional operating sites. Helicopters only offer any truly significant advantage over the use of aeroplanes for passenger transport by being able to operate away from conventional aerodromes into and from ad hoc sites or specially designed heliports.

2.5 If it is necessary, or if it is desired, to licence a heliport, application should be made to the CAA Head of Aerodrome Standards Department. An Aerodrome Inspector will be assigned who will provide detailed guidance until the site is licensed, after which the site will be periodically audited and the inspector will act as the liaison link between the aerodrome licensee and the CAA. A fee is payable.

3. Unlicensed Sites (Ground Level)

3.1 When considering an ad hoc site for use by single engine (Group B/Class 3) helicopters it is necessary for public transport flights, and recommended for others, to allow sufficient space for the use of the take-off and landing profiles certificated and described in the aircraft's Flight Manual. The take-off profile is similar for all single-engine types. From a low hover the aircraft is accelerated close to the ground until the safe climb speed (about 40/50 kts) is reached, at which stage the aircraft is climbed away maintaining this speed. The take-off distance is scheduled in the performance section of the flight manual from the hover to 100 feet above the take-off point assuming nil wind accountability. The distance varies with aircraft type. Examples of these distances are shown at Appendix 3. The first one third of the take-off distance should be at least 30 metres wide and the surface must be relatively firm and flat and free from all obstacles. The remaining two thirds of the Take-off Distance Available (TODAH), may contain insignificant or frangible obstacles within it, such that the aircraft, in the event of failure of the power unit, can force land without hazard to the occupants of the helicopter and without endangering persons or property on the surface. It is assumed that in the event of a power unit failure occurring from the time the aircraft moves away from the hover until it reaches 100 feet, that the ensuing forced landing will be made without any significant changes in aircraft direction being attempted. Above 100 feet the pilot is able to manoeuvre progressively more easily with increasing height above the surface to select a suitable, clear space, for a forced landing. Landings and take-offs by single-engine helicopters are not permitted at sites within congested areas unless it can be shown that there is no risk to third parties and that there are sufficient open spaces in which to force land, if necessary.

3.2 Multi engine helicopters can be operated in all Performance Classes (Class 1/Group A, Class 2/Group A Restricted and Class 3/Group B). Helicopters with more than 19 passengers (or when operating in a Congested Hostile Environment) must operate in Performance Class 1 - with full engine failure accountability in all stages of flight. Helicopters with 19 or less but more than 9 passengers must operate in Performance Class 1 or Performance Class 2 - with engine failure accountability in all but the initial take-off and final landing segments. Helicopters with 9 or less passengers may operate in Performance Class 1, Performance Class 2 or Performance Class 3. For flight in Performance Class 3, and the initial take-off and final landing segments of Performance Class 2, the helicopter must be able to perform a safe forced landing at all stages of flight.

3.3 For those sites which are in congested areas and which require Rule 5 permissions from the CAA, unless the operator can show that there is no third party risk in the event of a power unit failure, such permissions will be conditional upon the aircraft being operated to Group A/Class 1 performance. Thus in the overwhelming majority of such cases Group A/Class 1 performance is the required norm.

3.4 A Group A/Class 1 site must be large enough to accommodate the most demanding helicopter type intending to use the site with due regards to specific performance techniques and limitations set out in the helicopter's flight manual, but in any event must be large enough to accommodate twice the overall length of the largest helicopter intending to use the site. The ground should be firm and substantially level and free from loose articles which could endanger the aircraft or property or persons in the immediate vicinity of the helicopter downwash effect. Helicopter downwash is proportional to the weight and size of the machine producing it. For example an S61N displaces a volume of downwash equivalent to its weight of over 9 tonnes. The effect on nearby structures and people can be considerable. Loose dirt or gravel can cause damage to vehicles parked too close, whilst vulnerable persons can be blown over by the rotor downwash or hurt by flying debris. The area down wind of the helicopter is worst affected. In any case it is recommended that, whilst the helicopter is manoeuvring in a low hover, no object should be permitted closer than 1.5 x Rotor Diameter or 30 metres from the centre line of the helicopter, whichever is the greater.

3.5 The helicopter, especially in a congested area, can be noisy and can be the cause of complaints from members of the public. Noise certificates for helicopters are only applicable to types newly certificated after 1 August 1986. In effect therefore many helicopters on the UK civil register are currently not subject to noise restrictions. Under the Transport Act 2000, the CAA provides a focal point for receiving and responding to aircraft related environmental complaints from members of the public. Complainants should contact the Directorate of Airspace Policy, Consultation Section on 0207 453 6524 in this respect. When utilising permissions or exemptions under Rule 5, operators are advised to minimise nuisance on account of noise but where complaints are generated, and provided flight safety is not compromised, the CAA will advise the complainant to take the matter up directly with the operator or the Local Planning Authority (LPA). If the matter is found to relate to policy that the government has developed for aviation, the complainant will be advised to contact The Department for Transport, Civil Aviation Policy Division 4, 2 Marsham Street, London SW1P 3EB, Tel:0207 890 5847. It is suggested that noise and nuisance complainants be directed, in the first instance, to the Local Authority Environmental Health Officer if the issue cannot be resolved with the helicopter operator.

4. Unlicensed Sites (Elevated, Onshore)

4.1 Roof top helipads, by their very nature, are normally situated in congested areas. The operator therefore will require a Rule 5 permission from the CAA. By virtue of the nature of such sites and the perceived risk to third parties in a building itself or close by, only those helicopters capable of Group A/Class 1 performance are permitted to land at, or take-off from roof top sites. The helicopter type intended to be used must possess a helipad profile for the specific rooftop site within its flight manual; this technique, in the event of a failure to one of the power units occurring at any time during the take-off or landing, will enable the aircraft to reject safely on to the helipad available or to fly away avoiding all obstacles by a vertical margin of at least 35 feet.

In the absence of such a profile, permissions will only be granted provided the helicopter is able to hover outside ground effect with one engine inoperative at the site and in the prevailing ambient conditions.

4.2 The minimum size of the helipad will also be described in the Flight Manual or Flight Manual Supplement for the aircraft type under consideration. Roof top helipads not conforming to these dimensions should not be considered. Proposed use at night will attract the need for a CAA proving flight. Factors considered will include helipad size, obstacle environment, helipad and obstacle lighting provided, including use of approach path indicators (where provided) and visibility from the helicopter to be used. Thus a flight test programme, undertaken by the operator in conjunction with the CAA, will normally be required and a flight manual supplement and/or operations manual supplement issued for the particular site as an end product of the test process A special pilot training programme to ensure competency will also be necessary before a Rule 5 permission can be granted.

4.3 The provision of Rescue and Fire fighting services at elevated sites when used for any category of flights should be provided to the scales laid down in Flight Operations Department Communication 24/2005. Close liaison with local Fire Brigade and HSE agencies during the planning and construction stages of the roof top site should be established and maintained thereafter to ensure a viable "disaster" plan is in place when the roof top becomes operational.

4.4 In all cases it is recommended that the owner of a roof top facility proposed for use as a helipad should consult with the helicopter operator(s) and the local planning authority before committal to the project. Recent experience has shown that where planning permission goes to public enquiry, environmental considerations weigh heavily in the decision making process. The general public is aware of environmental matters and due recognition should be given to these sensitivities.

4.5 Roof top heliports should be recorded with the CAA. To this end an architect's drawing/plan together with aerial photographs of the site and/if, the roof top facility already exists, photographs taken to cover the area all around the site, should be forwarded to Flight Operations Inspectorate (Helicopters) in the case of public transport flights and to the General Aviation Department for private operations.

4.6 The structural and load bearing characteristics should be sufficient to accommodate the dynamic loading requirements caused by a helicopter having to force land on the site. Guidance on design load criteria is given in CAP 437 (available from the publications section of the CAA website at www.caa.co.uk) or in the ICAO Heliport Manual (Doc 9261 - AN/903) available from Airplan Flight Equipment. (See 2.1).

5. Local Authority Planning Consent

5.1 In general an ad hoc helicopter site will not attract the need for planning consent unless it is intended for use on more than 28 days in any calendar year. However, if any permanent structure is erected in connection with its use as a helicopter site, such as a hangar or hard standing, or if individual local council policies so demand, it may be necessary to obtain planning consent. It is always advisable to talk with the Local Planning Authority if there is any doubt as to the effect of such a site on the local community. For those sites intended for irregular, periodic use and for sites in congested areas it is also necessary that the local police are informed of any intended flying activity.

6. Recommended Helipad Sizes, Markings and Lighting (Onshore)

6.1 The information presented in the figures in the attached appendices and tables has been extracted from various sources found to be of interest to prospective site keepers. Leading particulars of many helicopter types are also included together with "worked examples" of Group A/Class 1 minimum sized ground level sites.

7. Joint Aviation Authority

7.1 The United Kingdom is a member of the Joint Aviation Authority (JAA), an organisation set up to co-ordinate aviation policy amongst member States. Member States are bound by EU Directive to implement agreed Joint Aviation Regulations (JARs). JAR (Operations) Part 3 (JAR-OPS 3), relates to helicopter operations, and was available for implementation by Public Transport operators in the UK in August 1999. JAR-OPS 3 will not be law within Europe until annexed to EU Council Regulation 3922/91. Public Transport helicopter operators are being encouraged to adopt JAR-OPS 3 before annexation; in which case such operations are issued with exemptions against certain provisions of the ANO to enable them to legally operate to JARs. The guidance contained in this document is designed to give broad guidance applicable to ICAO, ANO and JAR-OPS 3 requirements.http://

8. British Helicopter Association (BHA)

8.1 The BHA will provide straightforward guidance to members of the general public on the essentials for providing a suitable site for the occasional or one time use by helicopters. For further guidance or interpretation of these guidelines write to The British Helicopter Assocation, Graham Suite, West Entrance, Fairoaks Airport, Chobham, Woking, Surrey GU24 8HX.

9. Sites Close to Existing Aerodromes

9.1 Where helicopter landing sites are established close to operating aerodromes, especially within an Aerodrome Traffic Zone (ATZ), or otherwise within a radius of 2 nautical miles from any aerodrome, details of the site must be given to that aerodrome management or Air Traffic Service (ATS). The aerodrome management and/or ATS will need to mark the location of the site on their charts and maps in order to provide adequate local briefing and safe and speedy reaction to dealing with radio calls from helicopter pilots using the site. Pilots operating to these sites must comply with the aerodrome procedures when operating within the ATZ.

9.2 The site keeper has the duty of care to ensure that the helicopter landing site information is lodged with the aerodrome(s) concerned. The information can consist simply of the name of the site; the grid reference; and a contact telephone number.

9.3 In this context, "aerodrome" means any location where aviation activities are to be expected, for example; large and small civil and military airfields and airports, gliding club locations, flying club locations, microlight centres, parachuting centres, other helicopter landing sites etc.

10. Rescue and Fire Fighting Services (RFFS)

10.1 For licensed heliports, both temporary and permanent, Aerodrome Standards Department will impose an RFFS requirement as part of the licence. A heliport is not permitted to operate as a licensed facility whenever these requirements cannot be met.

10.2 Public Transport helicopter operators are advised in 'Flight Operations Department Communications 24/2005' (dated 16 September 2005) of the CAA's guidance on 'PROVISION OF RESCUE AND FIRE FIGHTING SERVICES (RFFS) FOR HELICOPTERS AT ONSHORE

UNLICENSED OPERATING SITES USED FOR THE PURPOSE OF PUBLIC TRANSPORT OPERATIONS'. Copies of FODCOM 24/2005 can be obtained from the Flight Operations Inspectorate (Helicopters) or the SRG website 'Publications'. However, site keepers are reminded that the responsibility for the safety of all helicopter flying operations, at unlicensed sites, including adequate provision of RFFS, lies wholly with the helicopter operator. See also paragraph 1.6.

11. Guidance Amendment

11.1 This guidance is amended from time to time and users should check with the BHA for the date of the current edition. The BHA Website will always display the most up to date copy of the guidelines.

Appendix 1

Recommended Helipad Sizes, Markings and Lighting for Onshore Helicopter Sites

1. Final Approach and Take Off Area (FATO)

1.1 This is the term applied to the area over which a helicopter will execute the final part of the final approach and the initial part of the take off. It is analogous to an aeroplane runway and must be suitable for the type of helicopter under consideration to reject on to in the event of a power unit failure. Unless the extent of the FATO is clearly self evident, for permanent installations, the area should be delineated with white markers 1 metre wide as follows:

1.2 For a square or rectangular FATO the marker length should be 1 x 3 metres with at least 3 per side including a marker at each corner and a maximum spacing between markers of 90 metres; FATO markings should be visible from 1000 ft/ 2km.

1.3 For a circular or any other shaped FATO the markers should be equally disposed around the perimeter with a maximum spacing of 10 metres between markers and a minimum of 5 markers.

1.4 FATOs for temporary, short term use sites may alternatively be delineated with high visibility tape or similar markers provided the extent of the FATO is clearly distinguishable and temporary markings are not likely to be blown around and become a hazard to the helicopter or bystanders.

1.5 The FATO should be surrounded by a Safety Area (SA) 3 metres or 0.25 times the greatest dimension of the helicopter width, whichever is the greater. Markers should designate the FATO plus SA together NB: the SA need not necessarily be a load-bearing surface.

1.6 The FATO plus SA should be as level as possible. It is recommended that the overall slope of the FATO should not exceed 3% i.e. 1 degree 43 mins.

2. Touch Down and Lift Off Area (TLOF)

2.1 A load bearing area of any shape on which it is intended that the helicopter shall land on from, and take off to, the hover. It may form an integral part of the FATO or be situated apart from the FATO depending on the disposition of the site. It's diameter should be at least 1.5 times the largest dimension of the undercarriage of the largest helicopter intended to use the site and should take account of the distance by which any of the aircraft doors extend beyond the dimensions of the undercarriage e.g. Sikorsky S61 (see Fig 5).

2.2 The touchdown marking should be yellow circle 0.5 metres wide. The inner diameter of the circle should ideally be 0.5 times the greatest dimension of the largest helicopter intended to use the site but may have to be predicated on the dimensions given at paragraph 2.1 above. For all but hospital sites a white "H" 3 metres by 1.8 metres with a line width of 0.4 metres should be provided to indicate the aiming point for the helicopter pilot to land on. Hospital sites should be provided with a red "H" superimposed on a white cross as shown in Figure 3. Where the TLOF is set apart from the FATO, it may be necessary for a pilot to make an approach to a particular point on the FATO before proceeding to the TLOF. In this case a white triangular Aiming Point Marker, as described in ICAO Annex 14, Volume II, Section 5.2.6 may be used.

3. Lighting

3.1 Paragraph 1, sub paragraph 1.6 explains the legal responsibilities for the provision of lighting for the public transport of passengers at night.

3.2 It is unusual for private helipads (other than hospitals) to have a requirement for lighting. If this requirement should exist, site keepers may contact the CAA, Flight Operations (Helicopters), for guidance on the specific layout and requirements for helipad lighting systems. The latest “best practice requirements” for FATO and TLOF lighting systems are described in the relevant sections of Annex 14 volume 2, No 3 amendment (25/11/04)

3.3 Lighting requirements for elevated sites should always be referred to the CAA for approval at the planning stage. Guidance contained in CAA letter 10A/253/16/3 dated 17 November 2003 may also be relevant in the case of purpose built ground level and elevated sites.

4.0 Wind Direction Indicators

4.1 A wind direction indicator may be a wind sleeve, flag or continuous smoke source. It should be situated so as to be visible from a helicopter in flight, in a hover or on the movement area and should indicate the wind conditions over the FATO in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It should be illuminated for night use.

Appendix 2

BRITISH REGISTERED HELICOPTERS

TYPE	OVERALL LENGTH	ROTOR DIAMETER	MAX UNDER CARRIAGE DIMENSION	MAX AUW (KGS)
ROBINSON R22	8.78	7.68	1.92	622
ROBINSON R44	11.76	10.06	2.19	1089
ENSTROM 280	8.78	9.75	2.26	1180
ENSTROM F28	8.96	9.75	2.26	1180
MDH 269/300	9.39	8.17	1.98	930
MDH 369/500	9.30	8.05	2.07	1360
BELL 47	13.29	11.31	2.59	1338
BELL 206B	11.95	10.15	1.83	1452
BELL 206 L	12.95	11.28	2.20	1883
EC 135	12.16	10.20	2.65	2630
MD902	11.84	10.34	2.84	2835
SA341 G	11.98	10.52	1.95	1800
AS350 SQUIRREL	12.98	10.70	2.20	1950
AS355 TWIN SQUIRREL	12.98	10.70	2.01	2400
BO105	11.81	9.90	2.53	2300
AGUSTA 109	13.04	11.0	3.54	2600
SA365 C DAUPHIN	13.22	11.67	3.6	3500
SA365 N DAUPHIN	13.68	11.93	3.61	4250
BELL 222	15.33	12.80	3.72	3742
SIKORSKY S76	16.00	13.41	5.00	5171
BELL 212	17.47	14.63	2.53	5080
AS332L SUPER PUMA	18.70	15.52	3.79	8599
BELL 214 ST	18.96	15.85	2.53	7936
AS332 L2 SUPER PUMA	19.50	16.20	5.24	9150
SIKORSKY S61N / SEA KING	22.20	18.90	7.16	9300
EH 101	22.80	18.60	7.00	14515
EUROCOPTER EC 225	19.50	16.20	5.25	11000
SIKORSKY S92	20.88	17.17	6.25	11861

Dimensions in Metres

Appendix 3

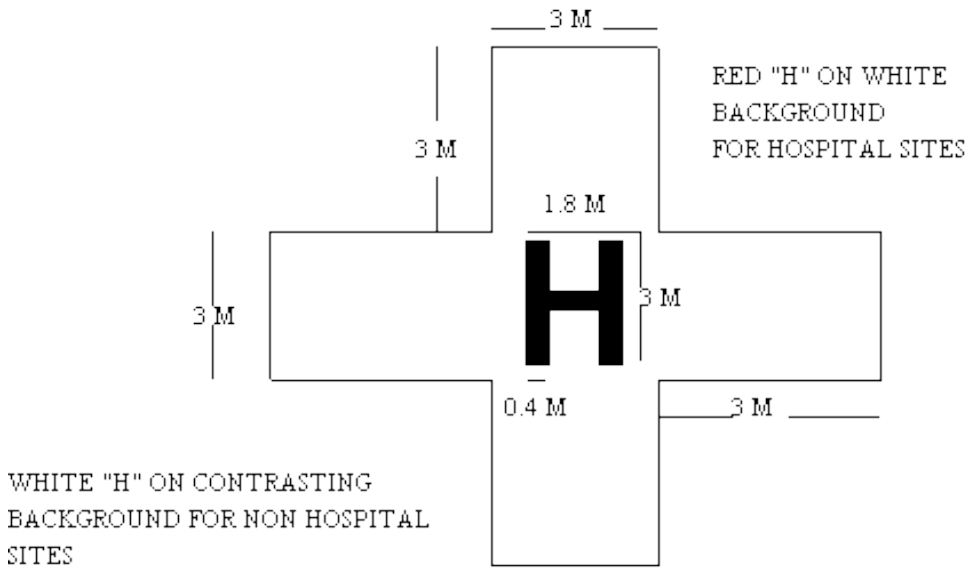
TAKE-OFF AND LANDING DISTANCES REQUIRED BY HELICOPTERS OPERATING TO

PERFORMANCE GROUP B / CLASS 3

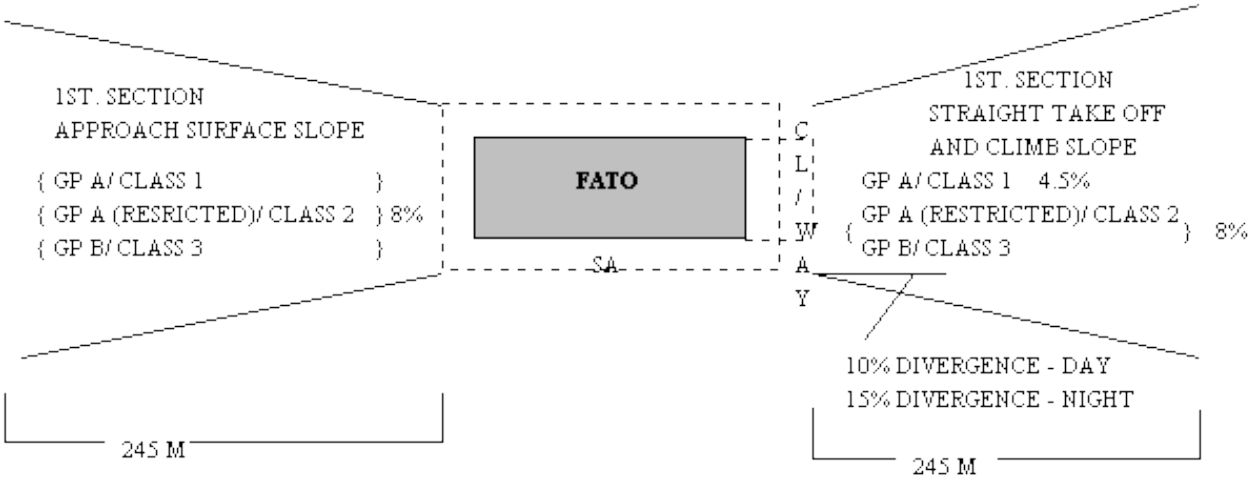
TYPE	MTWA KGS	FATO first one third distance to 100 feet	TAKE OFF DISTANCE TO 100 FEET	EMERGENCY LANDING DISTANCE FROM 100 FEET	ROTOR DIAMETER	OVERALL LENGTH OF HELICOPTER (INCLUDING ROTORS) "D"
ROBINSON R22	622	122	366	110	7.68	8.78
ROBINSON R44	1089	143	427	305	10.06	11.76
ENSTROM 280	1180	58	168	151	9.75	8.95
MDH 369/500	1360	77	230	189	8.05	9.30
BELL 47	1338	56	168	117	11.31	13.29
BELL 206 B	1452	95	263	229	10.15	11.95
BELL 206 L	1883	95	285	232	11.28	12.95
SA341 G GAZELLE	1800	102	305	140	10.52	11.98
AS350 SQUIRREL	1950	200	500	460	10.70	12.98
HILLER 12 E	1405	56	168	117	10.80	12.41

NOTE: Dimensions/ Wts. are representative figures for the types listed. Exact dimensions where needed should be extracted from individual aircraft data. Dimensions in Metres.

Appendix 4


3 M
3 M
1.8 M
3 M
3 M
0.4 M
3 M
RED "H" ON WHITE BACKGROUND FOR HOSPITAL SITES
WHITE "H" ON CONTRASTING BACKGROUND FOR NON HOSPITAL SITES

DIMENSIONS AND SLOPES OF OBSTACLE LIMITATION SURFACES

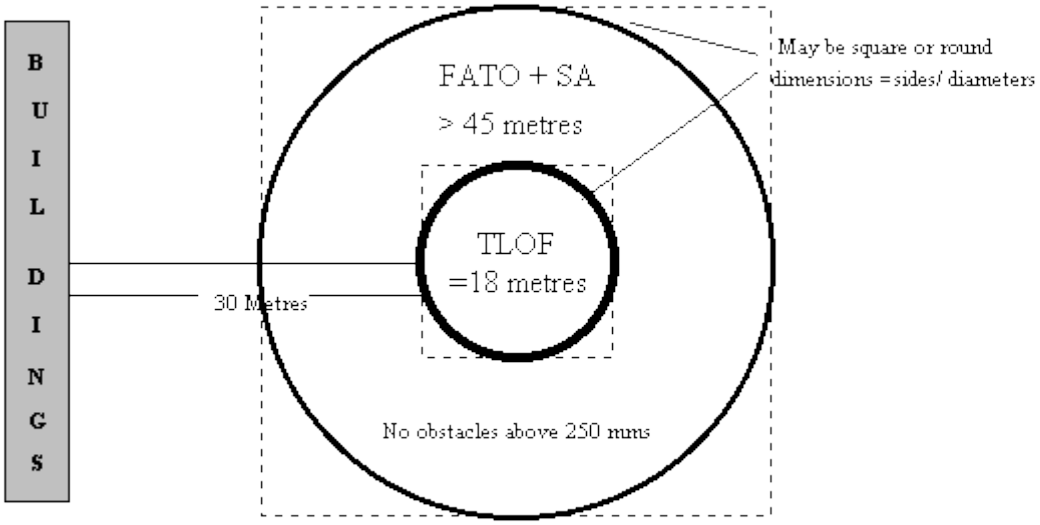


Notes:

1. 8% slope = 4 degrees 32 mins .4.5% slope = 2 degrees 34 mins
2. The most limiting criterion is the take off/ climb surface for Group A/ Class 1 aircraft.

Fig. 4.

HELIPAD LAYOUT AND MINIMUM DIMENSIONS
FOR SIKORSKY S 61 N/ SEAKING



Notes:

Touchdown and Lift off area = 1.5 x largest undercarriage dimension
= 1.5 x 7.16 m
= 10 .74 m (say 11 m) **but**

Nose - Tail distance to accommodate aircraft doors = 18 m

FATO +SA = 2 x Overall length of S 61N (D)
= 2 x 22.2 m
= 44.4 m (say 45 m)

Minimum permitted distance of TLOF from obstacles = 1.5 x RD
= 1.5 x 18.9 m
= 28.35 m (say 30 m)

It is strongly recommended that the TLOF should be located 30 metres or more from buildings to avoid downwash and noise effects.

TLOF to be firm, flat and load bearing to 2.5 x MTWA = 23.25 Tonnes

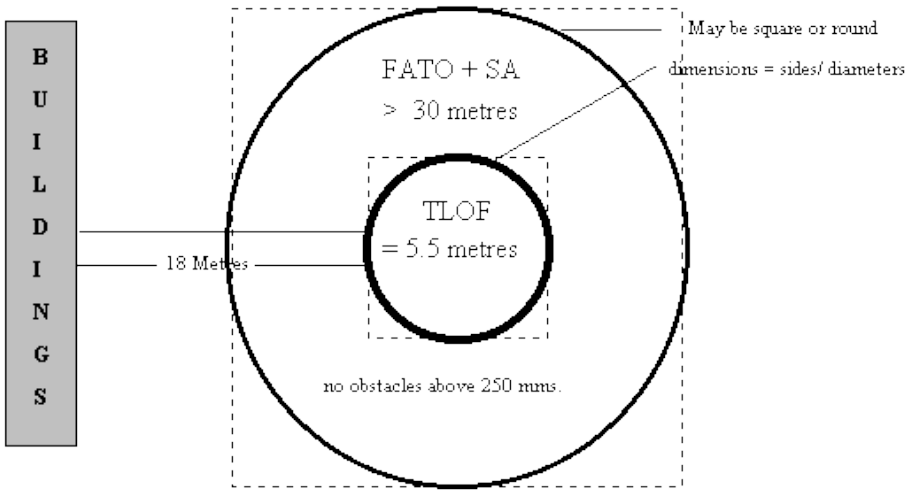
Recommended concrete/ paved surface for access by hospital utilities in all weather conditions.

Fig. 5.

The civil S61N, in order to use a site of this size, would need to have outside ground effect hover performance, one engine inoperative. For normal Group A/Class 1 profiles a FATO of about 300 metres would be required.

Appendix 4

HELIPAD LAYOUT AND MINIMUM DIMENSIONS FOR EUROCOPTER SA 365 N



Notes:

Touchdown and Lift off area = 1.5 x largest undercarriage dimension
= 1.5 x 3.61
= 5.415 m (say 5.5 m)

FATO + SA = 2 x Overall length of SA 365 N (D)
= 2 x 13.47 m
= 26.94 m (say 30 m) **but**

Flight Manual helipad profile requires minimum area of 2.5 x 11.92 (RD)
= 29.8 m (say 30m)

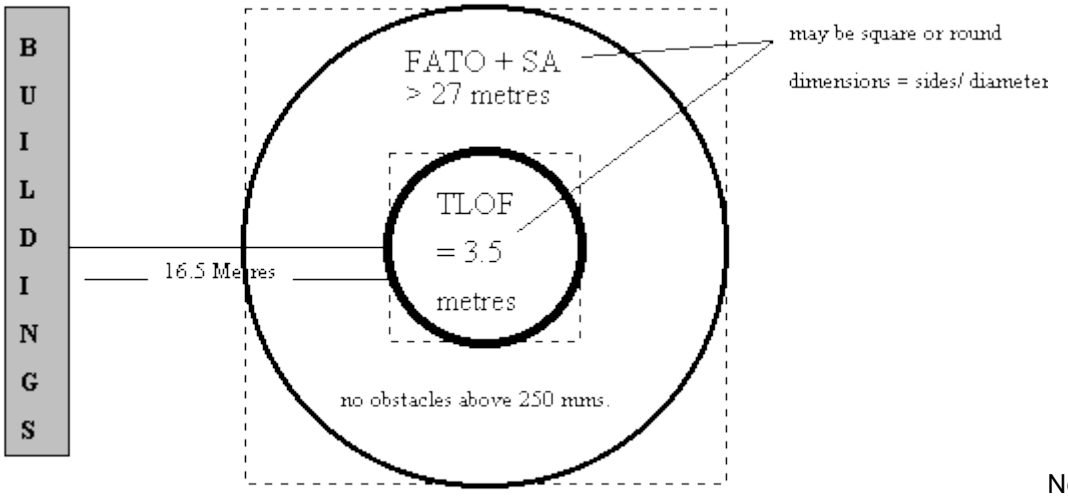
TLOF surface to be firm, flat and load bearing to 2.5 MTWA = 10 Tonnes
Recommended concrete/ paved surface for access by hospital utilities in all weather conditions.

Minimum permitted distance from buildings = 1.5 x RD
= 1.5 x 11.92m
= 17.88 m (say 18 m)

It is strongly recommended that the TLOF be located 30 metres or more away from buildings to avoid downwash effects and noise.

Fig. 6.

HELIPAD LAYOUT AND MINIMUM DIMENSIONS FOR EUROCOPTER AS355



Notes:

Touchdown and Lift off area = 1.5 x largest undercarriage dimension

= 1.5 x 2.01

= 3.015 (say 3.5 m)

FATO + SA = 2 x Overall length of AS355 (D)

= 2 x 12.98

= 25.96 (say 26 m) **but**

Flight Manual helipad profile requires minimum area of 2.5 x 10.7 (RD)

= 26.75 (say 27 m)

TLOF surface to be firm, flat and load bearing to 2.5 x MTWA = 6 Tonnes

Recommended concrete/paved surface for access by hospital utilities in all weather conditions.

Minimum permitted distance from buildings/obstacles = 1.5 x RD

= 1.5 x 10.70

= 16.05 (say 16.5 m)

It is strongly recommended that the TLOF should be located 30 metres or more away from buildings to avoid downwash and noise effects on the structure and disturbance/annoyance to persons in the building.

Fig.7.