European Aviation Safety Agency

Notice of Proposed Amendment 2017-14

Certification specifications and guidance material for the design of surface-level VFR heliports located at aerodromes that fall under the scope of Regulation (EC) 216/2008

'CS-HPT-DSN — Issue 1'

RMT.0638

EXECUTIVE SUMMARY

The objective of this NPA is to introduce certification specifications (CS) and guidance material (GM) for the design of surface-level VFR heliports located at aerodromes that fall under the scope of Regulation (EC) 216/2008 (Basic Regulation). EASA is proposing this issue of CS-HPT-DSN in order to support the aerodrome operators and the airport industry who, together with their respective competent authorities, carry out the certification of aerodromes in accordance with Commission Regulation (EU) No 139/2014. Where aerodromes that are in the scope of the Basic Regulation contain located surface-level visual flight rules (VFR) heliports, the certification process of these heliports would need to take into account the envisaged CS-HPT-DSN.

This NPA proposes to introduce the CS and GM mostly in accordance with the ICAO standards and recommended practices (SARPs) included in ICAO Annex 14, Aerodromes Volume II, Heliports, Fourth Edition (Including Amendment 7) and best industry practices.

Action area:	Aerodromes		
Affected rules:	Part-ADR		
Affected stakeholders:	Aerodromes, aerodrome operators;		
Driver:	Efficiency/proportionality	**Rulemaking group:**	No
Impact assessment:	Light	**Rulemaking Procedure:**	Standard

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1. About this NPA

1.1. How this NPA was developed

The European Aviation Safety Agency (EASA) developed this NPA in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2]. This rulemaking activity is included in the EASA 5-year Rulemaking Programme[3] under rulemaking task RMT.0638, 'Certification requirements for VFR heliports located at aerodromes that fall under the scope of Basic Regulation.'

The text of this NPA has been developed by EASA mainly based on ICAO Annex 14, Aerodromes, Volume II, Heliports, and the inputs of the stakeholders received via thematic meeting and consultations. It is hereby submitted to all interested parties[4] for consultation.

1.2. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at **http://hub.easa.europa.eu/crt/**[5].

The deadline for submission of comments is **1 November 2017**

1.3. The next steps

Following the closing of the public commenting period, EASA will review all comments. Based on the comments received, EASA will develop a decision issuing the CSs and GM for VFR heliports located at aerodromes that fall under the scope of the basic regulation.

The comments received and the EASA responses will be reflected in a comment-response document (CRD). The CRD will be annexed to the decision.

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1 Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1467719701894&uri=CELEX:32008R0216).

2 EASA is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure).

3 http://easa.europa.eu/rulemaking/annual-programme-and-planning.php

4 In accordance with Article 52 of Regulation (EC) No 216/2008 and Articles 6(3) and 7) of the Rulemaking Procedure.

5 In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).

2. In summary — why and what

2.1. Why we need to change the rules — issue/rationale

Basic Regulation extended the responsibilities of EASA to the areas of ATM/ANS and aerodromes. This new responsibility mandated EASA to prepare Implementing Rules (IRs) in support of the European Commission, as well as to issue CSs and GM and Acceptable Means of Compliance (AMC) and GM for the design, certification and oversight of aerodromes by the National Aviation Authorities (NAAs).

According to Article 4, paragraph 3(a) of the Basic Regulation, the scope of aerodromes subject to common rules is limited to aerodromes:

— which are open to public use;

— which serve commercial air transport;

— where operations using instrument approach or departure procedures are provided;

— and

(a) have a paved runway of 800 metres or above; or

(b) exclusively serve helicopters.

This limits the scope of heliports to those which are either located at an aerodrome meeting the criteria above, or which are stand-alone heliports that meet the same set of criteria.

It was decided to exclude the heliport aspect from the set of initial aerodrome rules and to make this subject to a later, dedicated rulemaking task. As yet, no stand-alone heliports meeting the technical criteria above, especially on instrument procedures, are known to be in operation in Europe, so it has been proposed to limit the task to the set of surface-level VFR heliports located at an aerodrome that fall under the scope of the Basic Regulation.

RMT.0638 suggests issuing the CSs as Book 1 and the related GM as Book 2, (CS-HPT-DSN).

These requirements will fulfil the design, certification and oversight processes for surface-level VFR heliports.

At an aerodrome which falls in the scope of the Basic Regulation and which has more than one runway and possible heliport, at least one runway should meet the criteria contained in Article 4 of the Basic Regulation. However, for other ‘types’ of runways or heliports at an aerodrome, it is not compulsory to meet the criteria of Article 4 of the Basic Regulation, but the requirements for their design, certification and oversight are applicable.

Additional information is provided in Chapter 4, Impact assessment, regarding the number of VFR heliports that are in the scope of this RMT.

2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2.

The specific objective of this NPA is to propose requirements in the field of surface-level VFR heliports that ensure:

— a smooth transition from national-based to European regulation, maintain the existing level of safety, and that are harmonised with the relevant ICAO Annex 14, Aerodromes, Volume II, Heliports; and
— cost-efficiency and level playing field.

More information is provided in Chapter 4, Impact assessment.

2.3. How we want to achieve it — overview of the proposals

The CSs of Book 1 and the related GM in Book 2 are applicable to surface-level VFR heliport infrastructure provided at aerodromes that fall under the scope of the Basic Regulation and are for the exclusive use of helicopters. These should be used in conjunction with the CSs and GM for aerodrome design (CS-ADR-DSN). The CSs for aerodrome design (CS-ADR-DSN) are applicable to infrastructure intended for use by both helicopters and aeroplanes.

AMC and GM related to the heliport operations are already published for infrastructure for fixed wing aircraft operations, and these will be applicable for infrastructure available to both fixed wing and helicopter operations.

The new heliport CSs and GM are based on ICAO SARPs contained in ICAO Annex 14, Aerodromes, Volume II, Heliports, including the following aspects for VFR Heliports:

— Definitions and applicability;
— Surface-level VFR heliport data needed for heliport certification;
— Location requirements;
— Physical characteristics;
— Obstacle limitation surfaces and sectors, and obstacle limitation requirements;
— Separation distances in relation to movement area and infrastructure;
— Visual aids (indicators, markings, markers and lights).

All of above proposed requirements:

— reflect the state of the art in the field of VFR heliports located at an aerodrome and take into account the applicable ICAO SARPs;
— provide the necessary flexibility;
— integrate, if applicable, best practices from among the EASA Member States or from other regulatory systems;
— be proportionate to the size, traffic, category, and complexity of the aerodrome/heliport and the nature and volume of operations conducted there;
— take into account worldwide heliport/aerodrome operation experience, as well as scientific and technical progress.

2.4. What are the expected benefits and drawbacks of the proposals

The implementation of the proposed provisions for surface-level VFR heliports will enable heliports located at aerodromes that fall under the scope of the Basic Regulation to be included in the aerodrome certification process. More information is provided in Chapter 4, Impact assessment

3. Proposed amendments and rationale in detail

The proposed NPA is for implementation of a new regulation. The NPA contains the following chapters and sections:

CHAPTER A — General: Applicability, Definitions.

CHAPTER B — Helicopter Operating Areas: Final Approach and Take-Off Areas, Helicopter Clearways, Touchdown and Lift-Off Areas, Safety Areas.

CHAPTER C — HELICOPTER TAXIWAYS AND TAXI-ROUTES: Helicopter ground taxiways and helicopter ground taxi-routes, Helicopter air taxiways and helicopter air taxi-routes.

CHAPTER D — HELICOPTER STANDS: Helicopter Stands.

CHAPTER E — OBSTACLE LIMITATION SURFACES AND REQUIREMENTS: General, Approach surface, Take-off climb surface, Obstacle limitation requirements.

CHAPTER F — VISUAL AIDS: General, Wind direction indicators, Heliport identification marking, Final approach and take-off area perimeter marking or markers, Final approach and take-off area designation markings, Aiming point marking, Touchdown and lift-off area perimeter marking, Touchdown/positioning marking, Heliport name marking, Helicopter ground taxiway markings and markers, Helicopter air taxiway markings and markers, Helicopter stand markings, Flight path alignment guidance marking, Approach lighting system, Flight path alignment guidance lighting system, Visual alignment guidance system, Heliport visual approach slope indicator, Final approach and take-off area lighting systems, Aiming point lights, Touchdown and lift-off area lighting system, Taxiway lights, Visual aids denoting obstacles.

3.1. Draft certification specifications (BOOK 1)

CHAPTER A — GENERAL

CS HPT-DSN.A.010 Applicability

(a) The certification specifications (CSs) of Book 1 and the related guidance material (GM) in Book 2 are applicable to the design of surface-level VFR heliports located at aerodromes that fall under the scope of Commission Regulation (EC) No 216/2008

(b) The CSs of Book 1 and GM of Book 2 should be used in conjunction with the CSs and GM for aerodrome design (CS-ADR-DSN).

(c) The CSs for aerodrome design (CS-ADR-DSN) are applicable to infrastructure intended to be used by both helicopters and aeroplanes.

CS HPT-DSN A.020 Definitions

For the purposes of Books 1 and 2, the following definitions should apply:

Note: The following definitions are in addition to those listed in CS-ADR-DSN.

'D' means the largest overall dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane or helicopter structure. 'D' is sometimes referred to in the text using the terminology 'D-value'.

'Declared distances' — heliports means:

— Take-off distance available (TODAH). The length of the FATO plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

— Rejected take-off distance available (RTODAH). The length of the FATO declared available and suitable for helicopters operated in performance class 1 to complete a rejected take-off.

— Landing distance available (LDAH). The length of the FATO plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

'Dynamic load-bearing surface' means a surface capable of supporting the loads generated by a helicopter conducting an emergency touchdown on it.

'Final approach and take-off area (FATO)' means a defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by helicopters operated in performance class 1, the defined area includes the rejected take-off area available.

'Helicopter air taxiway' means a defined path on the surface established for the air taxiing of helicopters.

'Helicopter clearway' means a defined area on the ground or water, selected and/or prepared as a suitable area over which a helicopter operated in performance class 1 may accelerate and achieve a specific height.

'Helicopter ground taxiway' means a ground taxiway intended for the ground movement of wheeled undercarriage helicopters.

'Helicopter stand' means an aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations.

'Helicopter taxi-route' means a defined path established for the movement of helicopters from one part of a heliport to another. A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.

'Heliport' means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

'Heliport elevation' means the elevation of the highest point of the FATO.

'Heliport reference point (HRP)' means the designated location of a heliport or a landing location.

'Protection area' means an area within a taxi-route and around a helicopter stand which provides separation from objects, the FATO, other taxi-routes and helicopter stands, for safe manoeuvring of helicopters.

'Rejected take-off area' means a defined area on a heliport suitable for helicopters operating in performance class 1 to complete a rejected take-off.

'Runway-type FATO' means a FATO having characteristics similar in shape to a runway.

'Safety area' means a defined area on a heliport surrounding the FATO which is free of obstacles, other than those required for air navigation purposes, and intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.

'Static load-bearing surface' means a surface capable of supporting the mass of a helicopter situated on it.

'Surface-level heliport' means a heliport located on the ground or on a structure on the surface of the water.

'Touchdown and lift-off area (TLOF)' means an area on which a helicopter may touch down or lift off.

CHAPTER B — HELICOPTER OPERATING AREAS

CS HPT-DSN.B.100 Final Approach and Take-Off Areas (FATO)

(a) Location:

(1) A heliport should be provided with at least one final approach and take-off area (FATO).

(2) The FATO should be located so as to minimise the influence of the surrounding environment, including turbulence.

(b) Characteristics:

(1) A FATO should be obstacle free, however, touchdown and lift-off (TLOF) arrays of segmented point source lighting (ASPSL) or luminescent panels (LPs) with a height less than 5 cm can be provided for the installation of visual aids.

(2) Where a FATO is intended to be used by helicopters operated in performance class 1, its dimensions should be as prescribed in the helicopter flight manual (AFM) except that, in the absence of width specifications, the width should be not less than the greatest overall dimension (D) of the largest helicopter the FATO is intended to serve;

(3) Where a FATO is intended to be used by helicopters operated in performance class 2 or 3, its dimensions should be of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than:

(i) 1 D of the largest helicopter when the maximum take-off mass (MTOM) of helicopters the FATO is intended to serve is more than 3 175 kg;

(ii) 0.83 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3 175 kg or less.

(4) The surface of the FATO should:

(i) be resistant to the effects of rotor downwash;

(ii) be free of irregularities that would adversely affect the take-off or landing of helicopters;

(iii) have bearing strength sufficient to accommodate a rejected take-off by helicopters;

(iv) have a mean slope in any direction which should not exceed 3 per cent, and

(v) provide rapid drainage.

(5) No portion of a FATO should have a local slope exceeding:

(i) 5 per cent where the heliport is intended to be used by helicopters operated in performance class 1;

(ii) 7 per cent where the heliport is intended to be used by helicopters operated in performance class 2 or 3.

CS HPT-DSN.B.110 Helicopter Clearways

(a) Applicability: When provided, a helicopter clearway should be located beyond the end of the FATO.

CS HPT-DSN.B.120 Touchdown and Lift-Off Areas (TLOF)

(a) General:

(1) At least one TLOF should be provided at a heliport.

(2) One TLOF should be located within the FATO or one or more TLOFs should be collocated with helicopter stands.

(b) Characteristics:

(1) A TLOF should be of sufficient size to contain a circle of diameter of at least 0.83 D of the largest helicopter the area is intended to serve.

(2) Where the TLOF is within the FATO, the TLOF should be dynamic load-bearing.

(3) Where a TLOF is collocated with a helicopter stand, the TLOF should be static load-bearing and be capable of withstanding the traffic of the helicopters that the area is intended to serve.

(4) Slopes on a TLOF should be sufficient to prevent accumulation of water on the surface of the area and should not exceed 2 per cent in any direction.

(5) The surface friction characteristics of a TLOF should be suitable for the helicopter it is intended to serve.

(6) Where a TLOF is located within a FATO which can contain a circle of diameter more than 1 D, the centre of the TLOF should be located not less than 0.5 D from the edge of the FATO.

CS HPT-DSN.B.130 Safety Areas

(a) General: A FATO should be surrounded by a safety area which need not be solid.

(b) Characteristics:

(1) A safety area surrounding a FATO should extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 D, whichever is greater, of the largest helicopter the FATO is intended to serve and:

(i) each external side of the safety area should be at least 2 D where the FATO is quadrilateral (see Figure B-1); or

(ii) the outer diameter of the safety area should be at least 2 D where the FATO is circular.

(2) The surface of the safety area should be treated to prevent flying debris caused by rotor downwash.

(3) When solid, the surface of the safety area abutting the FATO should be continuous with the FATO.

(4) When solid, the surface of a safety area should not project above a plane having an upward slope of 4 per cent, commencing at the periphery of the FATO.

(5) From the outer edge of the safety area to a distance of 10 m there should be a protected side slope rising at 45 degrees.

(6) The protected side slope should not be penetrated by obstacles, except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface, where a safety assessment indicates that the safety of operations is not endangered.

(7) No mobile object should be permitted on a safety area during helicopter operations.

(8) No fixed object should be permitted above the plane of the FATO on a safety area, except for objects which, because of their function, must be located on the area.

(9) Objects whose function requires them to be located on the safety area at a distance of less than 0.75 D from the centre of the FATO, should not exceed 5 cm in height.

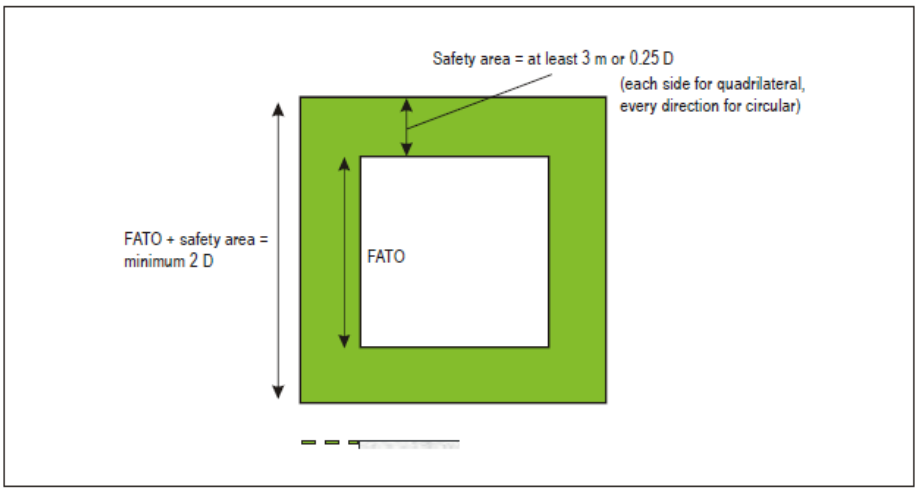


Figure B-1. FATO and associated safety area

CHAPTER C — HELICOPTER TAXIWAYS AND TAXI-ROUTES

CS HPT-DSN.C.200 Helicopter ground taxiways and helicopter ground taxi-routes

(a) General: A helicopter ground taxiway should be designed to permit the surface movement of a wheeled helicopter under its own power.

(b) Characteristics:

(1) The width of a helicopter ground taxiway should not be less than 1.5 times the largest width of the undercarriage (UCW) of the helicopters the helicopter ground taxiway is intended to serve (see Figure C-1).

(2) A helicopter ground taxiway should be centred on a helicopter ground taxi-route.

(3) A helicopter ground taxi-route should extend symmetrically on each side of the centre line for at least 0.75 times the largest overall width of the helicopters it is intended to serve.

(4) For simultaneous operations, the helicopter ground taxi-routes should not overlap.

(c) Slopes:

(1) The longitudinal slope of a helicopter ground taxiway should not exceed 3 per cent.

(2) The helicopter ground taxiway and the helicopter ground taxi-route should provide rapid drainage but the transverse slope of a helicopter ground taxiway should not exceed 2 per cent.

(d) Surface conditions:

(1) A helicopter ground taxiway should be static load-bearing and capable of withstanding the traffic of the helicopters the helicopter ground taxiway is intended to serve.

(2) The surface of a helicopter ground taxi-route should be resistant to the effect of rotor downwash.

(3) The surface friction characteristics of a helicopter ground taxi-route should be suitable for the helicopter it is intended to serve.

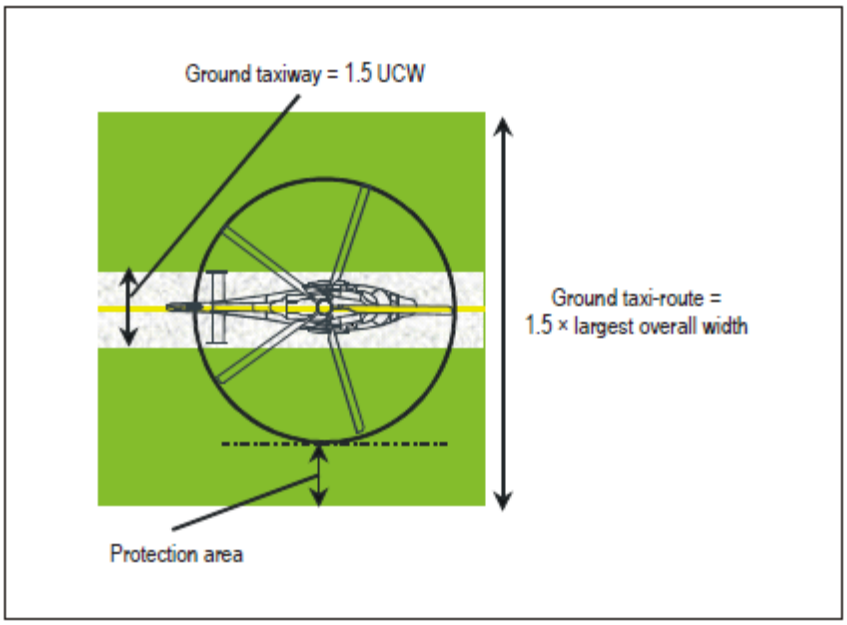


Figure C-1. Helicopter ground taxi-route/taxiway

(4) No fixed object should be permitted above the surface on a helicopter ground taxi-route, except for frangible objects, which, because of their function, must be located there.

(5) Objects whose function requires them to be located on a helicopter ground taxi-route should be located:

(i) at a distance of more than 50 cm from the edge of the helicopter ground taxiway; and

(ii) should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter ground taxiway, at a distance of 50 cm from the edge of the helicopter ground taxiway and sloping upwards and outwards at a gradient of 5 per cent.

(6) No mobile object should be permitted on a ground taxi-route during helicopter movements.

CS HPT-DSN.C.210 Helicopter air taxiways and helicopter air taxi-routes

(a) General: A helicopter air taxiway should be designed so as to permit the movement of a helicopter above the surface at a height normally associated with ground effect and at ground speed less than 37 km/h (20 kt).

(b) Characteristics:

(1) The width of a helicopter air taxiway should be at least two times the largest width of the undercarriage (UCW) of the helicopters that the helicopter air taxiway is intended to serve (see Figure C-2).

(2) A helicopter air taxiway should be centred on a helicopter air taxi-route.

(3) A helicopter air taxi-route should extend symmetrically on each side of the centre line for a distance at least equal to the largest overall width of the helicopters it is intended to serve.

(4) For simultaneous operations, the helicopter air taxi-routes should not overlap.

(c) Slopes:

(1) The slopes of the surface of a helicopter air taxiway should not exceed the slope landing limitations of the helicopters the helicopter air taxiway is intended to serve.

(2) The longitudinal slope of a helicopter air taxiway should not exceed 7 per cent.

(3) The transverse slope of a helicopter air taxiway should not exceed 10 per cent.

(d) Surface conditions:

(1) The surface of a helicopter air taxi-route should be resistant to the effect of rotor downwash.

(2) The surface of a helicopter air taxiway should be static load-bearing.

(3) The surface of a helicopter air taxi-route should provide ground effect.

(4) No mobile object should be permitted on an air taxi-route during helicopter movements.

(5) No fixed object should be permitted above the surface on an air taxi-route, except for objects which, because of their function, must be located there.

(6) Objects above ground level whose function requires them to be located on a helicopter air taxi-route should not:

(i) be located at a distance of less than 1 m from the edge of the helicopter air taxiway, or at a distance of less than 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centre line of the helicopter air taxiway, whichever is greater, and,

(ii) penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, and sloping upwards and outwards at a gradient of 5 per cent, at a distance of 1 m from the edge of the helicopter air taxiway, or 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centreline of the helicopter air taxiway, whichever is lower.

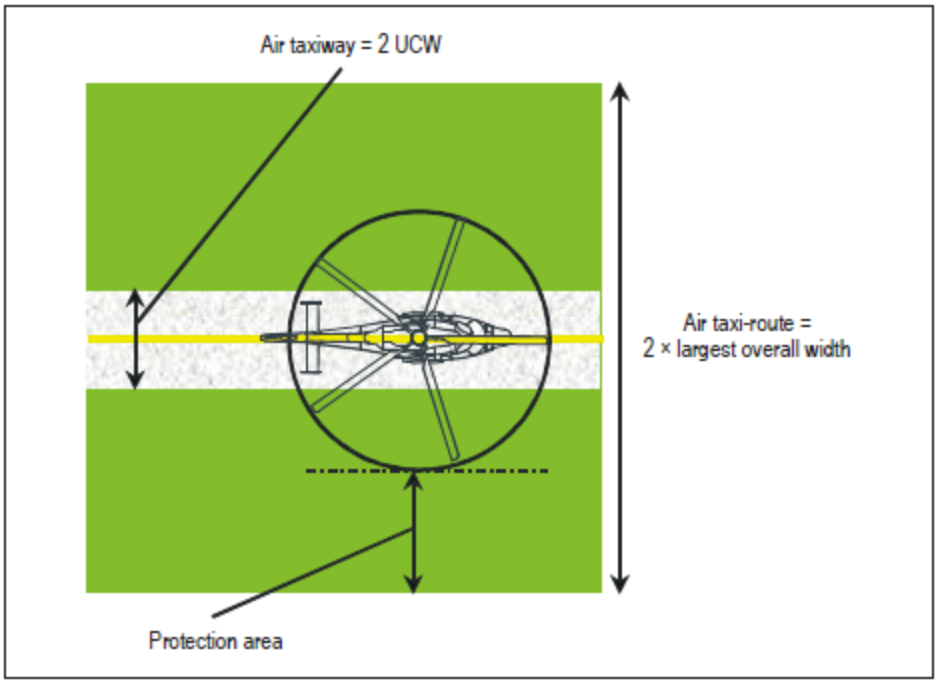


Figure C-2. Helicopter air taxi-route/taxiway

CHAPTER D — HELICOPTER STANDS

CS HPT-DSN.D.300 Helicopter Stands

(a) Characteristics:

(1) When a TLOF is collocated with a helicopter stand, the protection area of the stand should not overlap the protection area of any other helicopter stand or associated taxi route.

(2) When used by helicopters turning in a hover, a helicopter stand should be of sufficient size to contain a circle of diameter of at least 1.2 D of the largest helicopter the stand is intended to serve (see Figure D-1).

(3) Where a helicopter stand is intended to be used for turning, the helicopter stand should be surrounded by a protection area which extends for a distance of 0.4 D from the edge of the helicopter stand.

(4) Where a helicopter stand is intended to be used for turning, the minimum overall dimension of the stand and protection area should not be less than 2 D.

(5) Where a helicopter stand is intended to be used for taxi-through and where the helicopter using the stand is not required to turn, the minimum width of the stand and associated protection area should be that of the taxi-route.

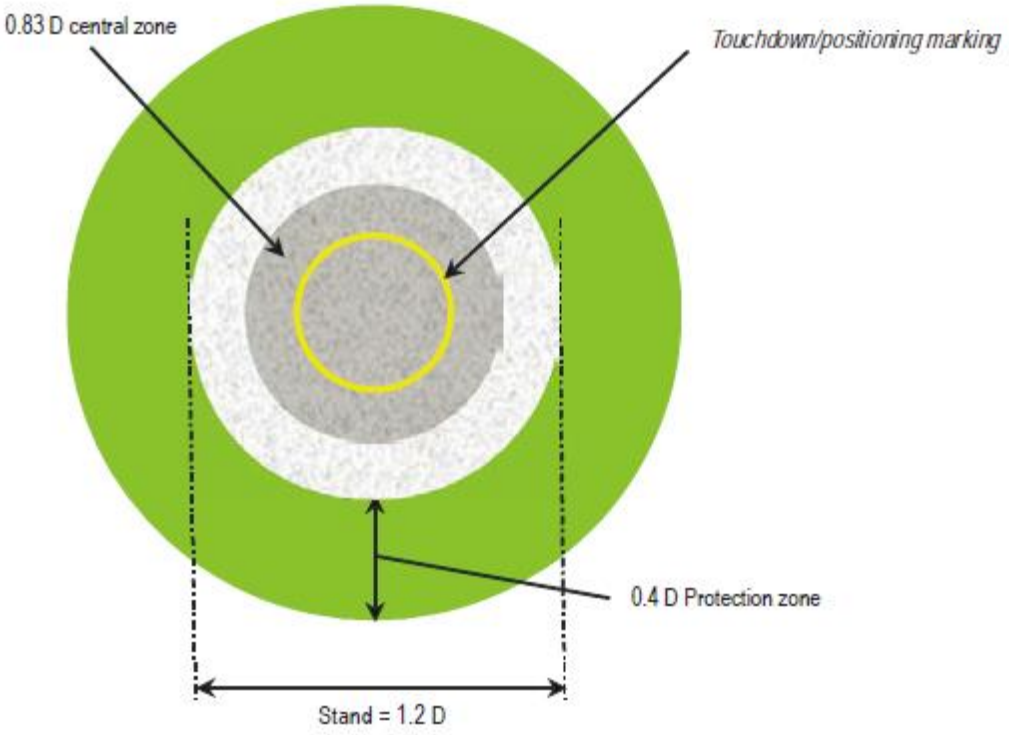


Figure D-1. Helicopter stand and associated protection area permitting the helicopter to turn in a hover when operating

(6) For simultaneous operations, the protection areas of helicopter stands and their associated taxi-routes should not overlap (see Figure D-2).

(7) Where non-simultaneous operations are envisaged, the protection areas of helicopter stands and their associated taxi-routes may overlap (see Figure D-3).

(b) Slopes:

(1) A helicopter stand should provide rapid drainage.

(2) The slope of a helicopter stand in any direction should not exceed 2 per cent.

(c) Surface conditions:

(1) No fixed object should be permitted above the surface of the ground on a helicopter stand, except for tie-down points with a height of less than 5 cm, which can be accommodated if needed.

(2) No mobile object should be permitted on a helicopter stand and the associated protection area during helicopter movements.

(3) No fixed object should be permitted above the surface of the ground in the protection area around a helicopter stand except for objects which, because of their function, must be located there.

(4) Objects whose function requires them to be located in the protection area at a distance of less than 0.75 D from the centre of the helicopter stand, should not exceed 5 cm in height.

(5) Objects whose function requires them to be located in the protection area at a distance of 0.75 D or more from the centre of the helicopter stand, should not penetrate a plane originating at a height of 25 cm above the plane of the central zone and sloping upwards and outwards at a gradient of 5 per cent.

(6) The surface friction characteristics of a helicopter stand should be suitable for the helicopter it is intended to serve.

(7) The central zone of a helicopter stand should be capable of withstanding the traffic of helicopters it is intended to serve and have a static load-bearing area:

(i) of diameter not less than 0.83 D of the largest helicopter it is intended to serve; or,

(ii) for a helicopter stand intended to be used for taxi-through, and where the helicopter using the stand is not required to turn, the same width as the helicopter ground taxiway.

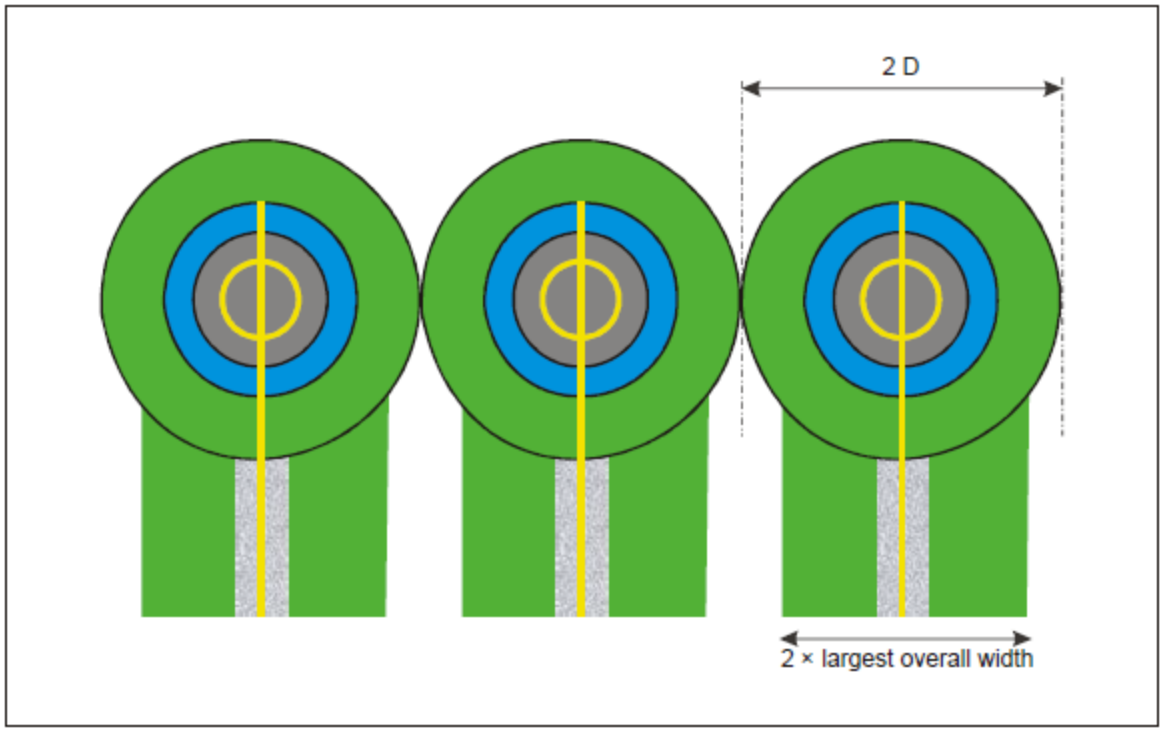


Figure D-2. Helicopter stands designed for hover turns with air taxi-routes/taxiways — simultaneous operations

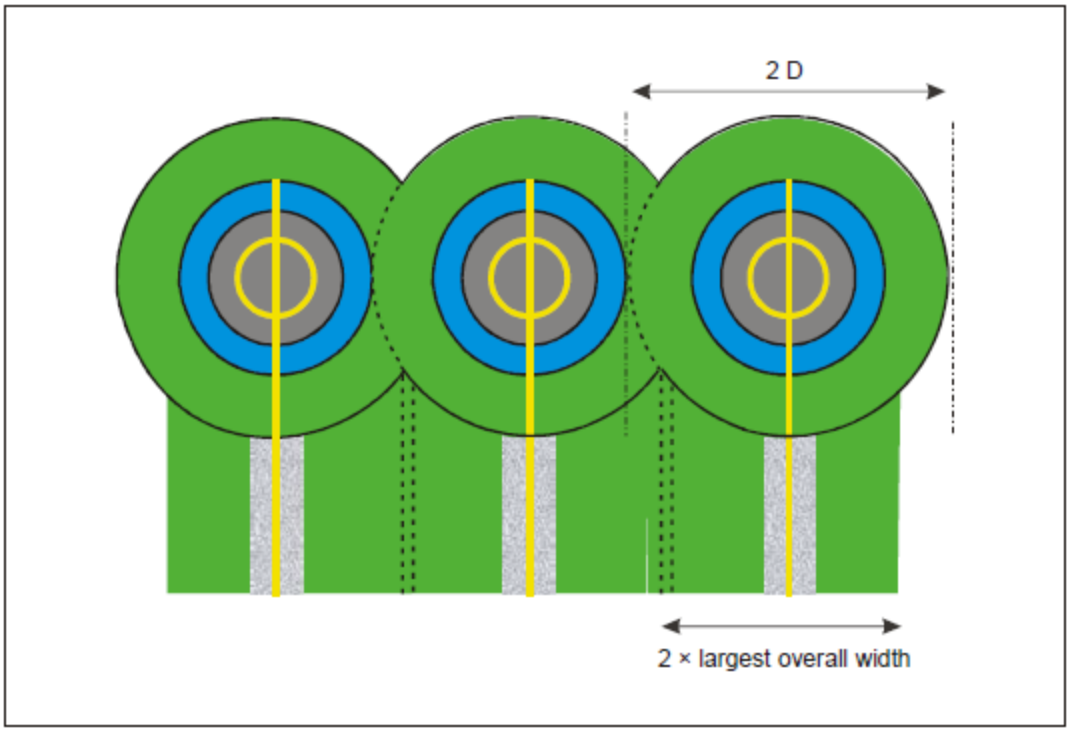


Figure D-3. Helicopter stands designed for hover turns with air taxi-routes/taxiways — non-simultaneous operations

CHAPTER E – OBSTACLE LIMITATION SURFACES AND REQUIREMENTS

CS HPT-DSN.E.400 General

(a) Applicability: The purpose of the specifications for obstacle limitation surfaces are to define the airspace around heliports so as to permit intended helicopter operations to be conducted safely, and to prevent, where appropriate controls exist, heliports from becoming unusable due to the growth of obstacles around them. A series of obstacle limitation surfaces is established to define the limits to which objects may project into the airspace.

CS HPT-DSN.E.410 Approach surface

(a) Applicability: The purpose of an approach surface is to protect a helicopter during the final approach to the FATO by defining an area that should be kept free from obstacles so as to protect a helicopter in the final phase of the approach to land manoeuvre.

(b) Description: An inclined plane or a combination of planes or, when a turn is involved, a complex surface sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO (see Figures E-1, E-2, E-3 and E-4 and Table E-1).

(c) Characteristics:

(1) an inner edge horizontal and equal in length to the minimum specified width/diameter of the FATO plus the safety area, perpendicular to the centre line of the approach surface and located at the outer edge of the safety area;

(2) two side edges originating at the ends of the inner edge diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO; and

(3) an outer edge horizontal and perpendicular to the centre line of the approach surface and at a specified height of 152 m (500 ft) above the elevation of the FATO.

(4) The elevation of the inner edge should be the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the approach surface. For heliports intended to be used by helicopters operated in performance class 1, the inclined plane may be raised directly above the FATO.

(5) The slope(s) of the approach surface should be measured in the vertical plane containing the centre line of the surface.

(6) In the case of an approach surface involving a turn, the surface should be a complex surface containing the horizontal normals to its centre line and the slope of the centre line should be the same as that for a straight approach surface (see Figure E-3).

(7) In the case of an approach surface involving a turn, the surface should not contain more than one curved portion.

(8) Where a curved portion of an approach surface is provided, the sum of the radius of arc defining the centre line of the approach surface and the length of the straight portion originating at the inner edge should not be less than 575 m.

(9) Any variation in the direction of the centre line of an approach surface should be designed so as not to necessitate a turn radius less than 270 m.

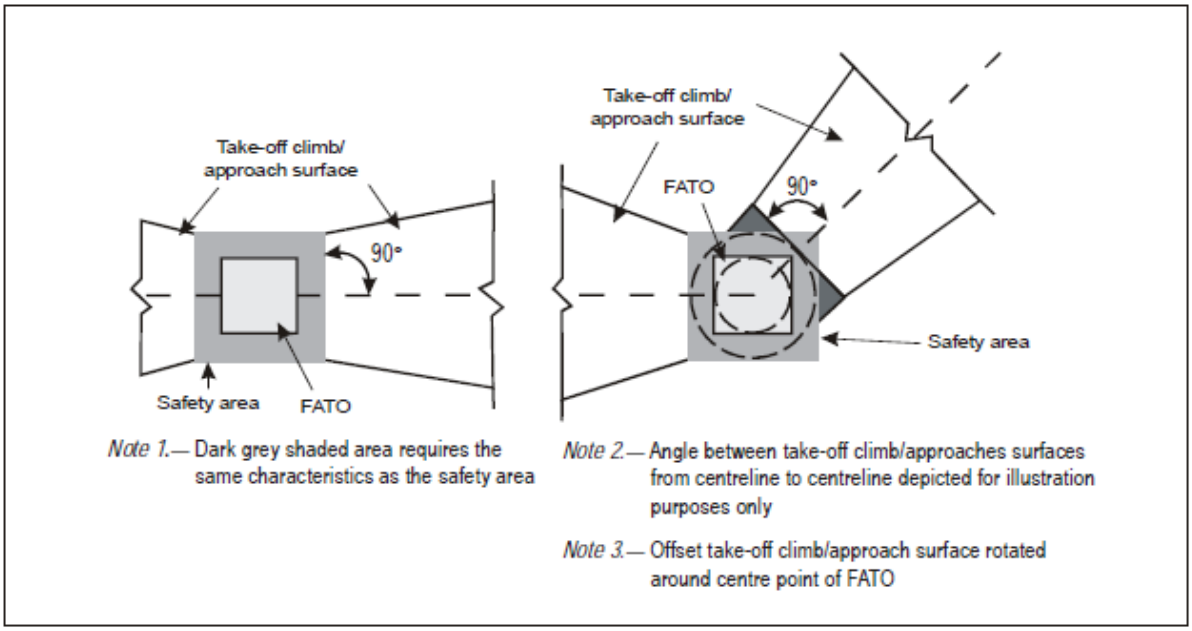


Figure E-1. Obstacle limitation surfaces — Take-off climb and approach surface

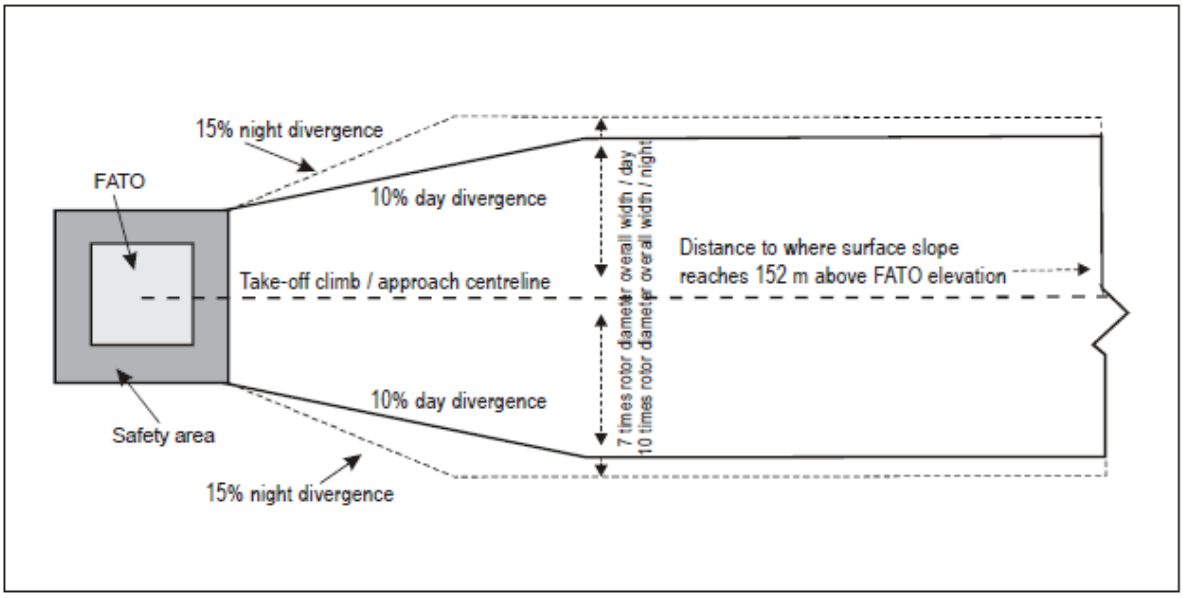


Figure E-2. Take-off climb/approach surface width

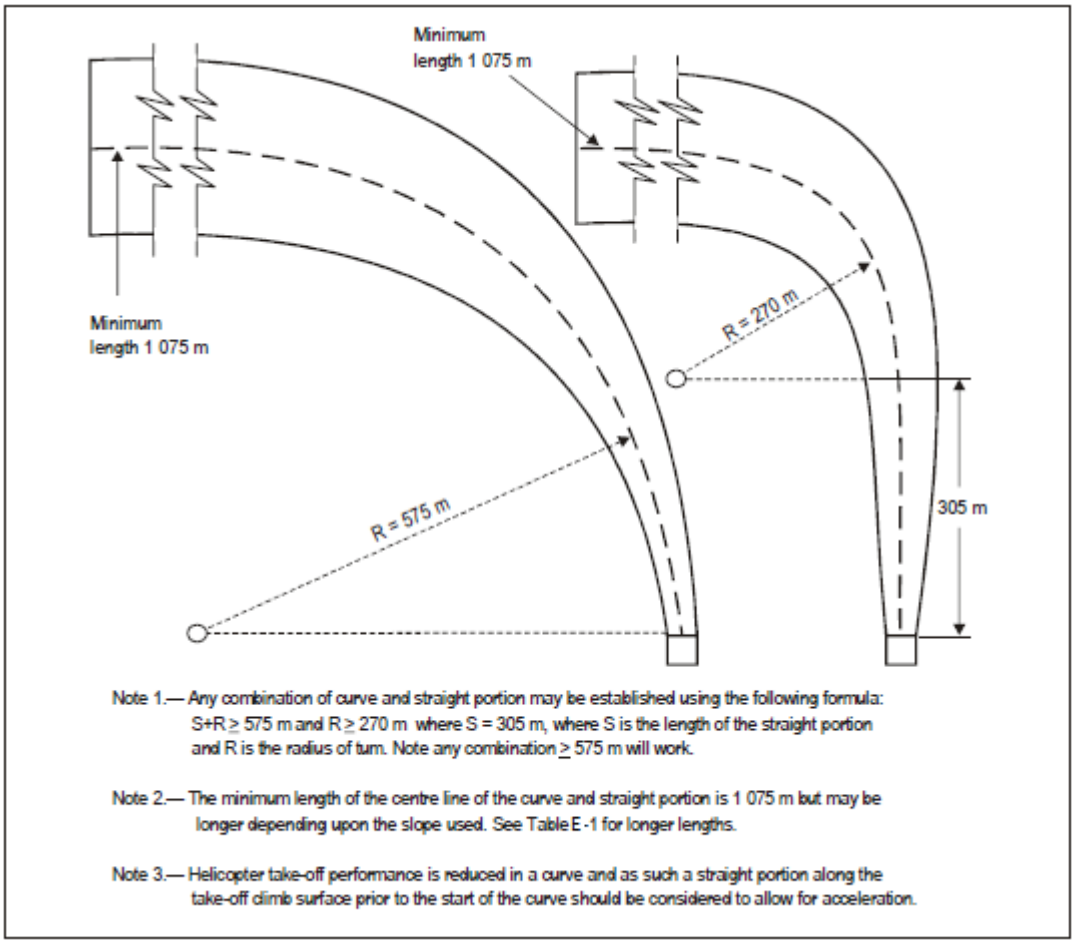


Figure E-3. Curved approach and take-off climb surface for all FATOs

SURFACE and DIMENSIONS	SLOPE DESIGN CATEGORIES[(c)]		
	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

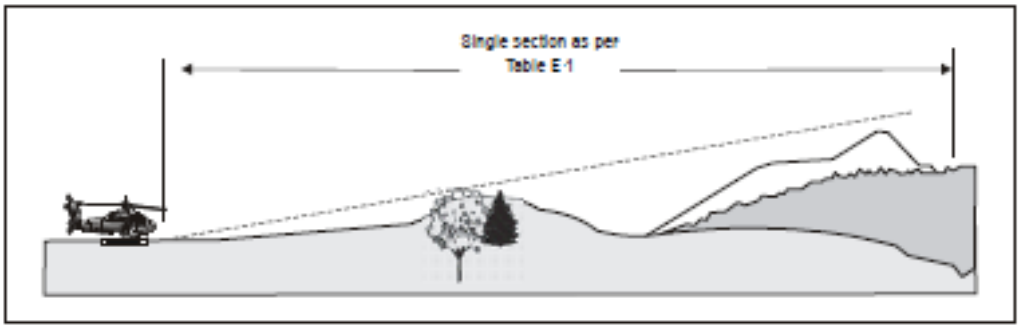
Table E-1. Dimensions and slopes of obstacle limitation surfaces for all visual FATOs

Notes:

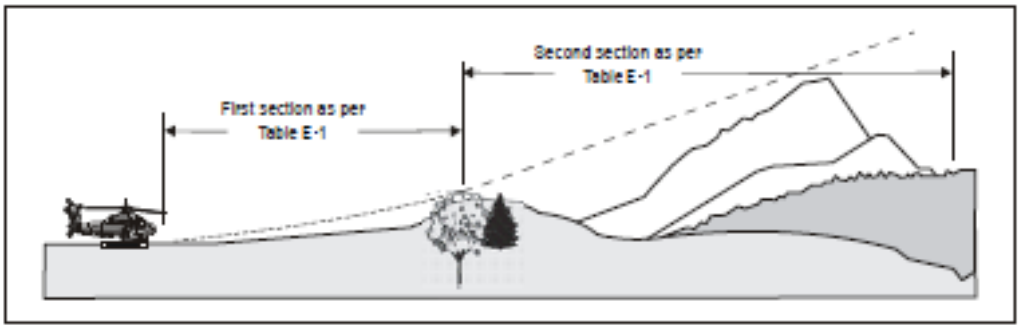
(a) The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, bring the helicopter to 152 m (500 ft) above FATO elevation.

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

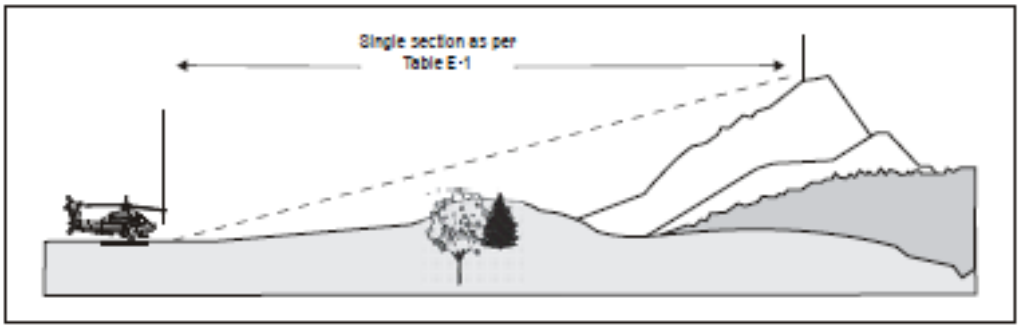
(c) The slope design categories depicted above represent minimum design slope angles and not operational slopes. Slope category 'A' generally corresponds with helicopters operated in performance class 1; slope category 'B' generally corresponds with helicopters operated in performance class 3; and slope category 'C' generally corresponds with helicopters operated in performance class 2.



a) Approach and take-off climb surfaces - 'A' slope profile - 4.5% design



b) Approach and take-off climb surfaces - 'B' slope profile - 8% and 16% design



c) Approach and take-off climb surfaces - 'C' slope profile - 12.5% design

Figure E-4. Approach and take-off climb surfaces with different slope design categories

CS HPT-DSN.E.420 Take-off climb surface

(a) Applicability: The purpose of the take-off climb surface is to protect a helicopter on take-off and during climb-out.

(b) Description: An inclined plane, a combination of planes or, when a turn is involved, a complex surface sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO (see Figures E-1, E-2, E-3, and E-4, and Table E-1).

(c) Characteristics:

(1) an inner edge horizontal and equal in length to the minimum specified width/diameter of the FATO plus the safety area, perpendicular to the centre line of the take-off climb surface and located at the outer edge of the safety area;

(2) two side edges originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO; and

(3) an outer edge horizontal and perpendicular to the centre line of the take-off climb surface and at a specified height of 152 m (500 ft) above the elevation of the FATO.

(4) The elevation of the inner edge should be the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the take-off climb surface. For heliports intended to be used by helicopters operated in performance class 1, the inclined plane may be raised directly above the FATO.

(5) Where a clearway is provided the elevation of the inner edge of the take-off climb surface should be located at the outer edge of the clearway at the highest point on the ground based on the centre line of the clearway.

(6) In the case of a straight take-off climb surface, the slope should be measured in the vertical plane containing the centre line of the surface.

(7) In the case of a take-off climb surface involving a turn, the surface should be a complex surface containing the horizontal normals to its centre line and the slope of the centre line should be the same as that for a straight take-off climb surface (see Figure E-5).

(8) In the case of a take-off climb surface involving a turn, the surface should not contain more than one curved portion.

(9) Where a curved portion of a take-off climb surface is provided the sum of the radius of arc defining the centre line of the take-off climb surface and the length of the straight portion originating at the inner edge should not be less than 575 m.

(10) Any variation in the direction of the centre line of a take-off climb surface should be designed so as not to necessitate a turn of radius less than 270 m.

CS HPT-DSN.E.430 Obstacle limitation requirements

(a) General: The following obstacle limitation surfaces should be established for a FATO

(1) take-off climb surface; and

(2) approach surface.

(b) Characteristics:

(1) The slopes of the obstacle limitation surfaces should not be greater than, and their other dimensions not less than, those specified in Table E-1 and should be located as shown in Figures E- 1, E-2 and E-4.

(2) Where a heliport visual approach slope indicator is installed, additional obstacle protection surfaces should be provided, as specified in CS HPT-DSN.F.660, which can be more demanding than the obstacle limitation surfaces prescribed in Table E-1.

(3) For heliports that have an approach/take-off climb surface with a 4.5 per cent slope design, objects can be permitted to penetrate the obstacle limitation surface, if after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters.

(4) New objects or extensions of existing objects should not be permitted above the approach or take-off climb surfaces except when shielded by an existing immovable object or after a safety assessment it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters.

(5) Existing objects above the approach and take off climb surfaces should, as far as practicable, be removed except when the object is shielded by an existing immovable object or after a safety assessment it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters.

(6) When only a single approach and take-off climb surface is provided, a safety assessment should be undertaken considering as a minimum, the following factors:

(i) the area/terrain over which the flight is being conducted;

(ii) the obstacle environment surrounding the heliport;

(iii) the performance and operating limitations of helicopters intending to use the heliport; and

(iv) the local meteorological conditions including the prevailing winds.

CHAPTER F — VISUAL AIDS

CS HPT-DSN F.500 General

(a) When a FATO has similar characteristics to a runway, the applicable CSs are provided in the paragraphs below entitled ‘runway-type FATO’.

(b) For all other types of FATO, the applicable CSs are provided in the paragraphs below entitled ‘All FATOs except runway-type FATOs’.

CS HPT-DSN.F.510 Wind direction indicators

(a) Applicability: A heliport should be equipped with at least one wind direction indicator.

CS HPT-DSN.F.520 Heliport identification marking

(a) Applicability: Heliport identification markings should be provided at a heliport.

(b) Location:

(1) For runway-type FATOs:

A heliport identification marking should be located in the FATO and when used in conjunction with FATO designation markings, should be displayed at each end of the FATO (See Figure F-2).

(2) For all FATOs except runway-type FATOs:

(i) A heliport identification marking should be located at or near the centre of the FATO (see Figure F-1).

(ii) On a FATO which contains a TLOF, a heliport identification marking should be located in the FATO so the position of it coincides with the centre of the TLOF.

(c) Characteristics:

(1) A heliport identification marking, should consist of a letter H, white in colour. The dimensions of the H marking should be no less than those shown in Figure F-3.

(2) Where the H marking is used for a runway-type FATO, its dimensions should be increased by a factor of 3 (see Figure F-2).

(3) A heliport identification marking should be oriented with the cross arm of the H at right angles to the preferred final approach direction.

(4) For a runway-type FATO, the numbers and the letter of the marking should have a colour contrasting with the background and should be in the form and proportion shown in Figure F-4.

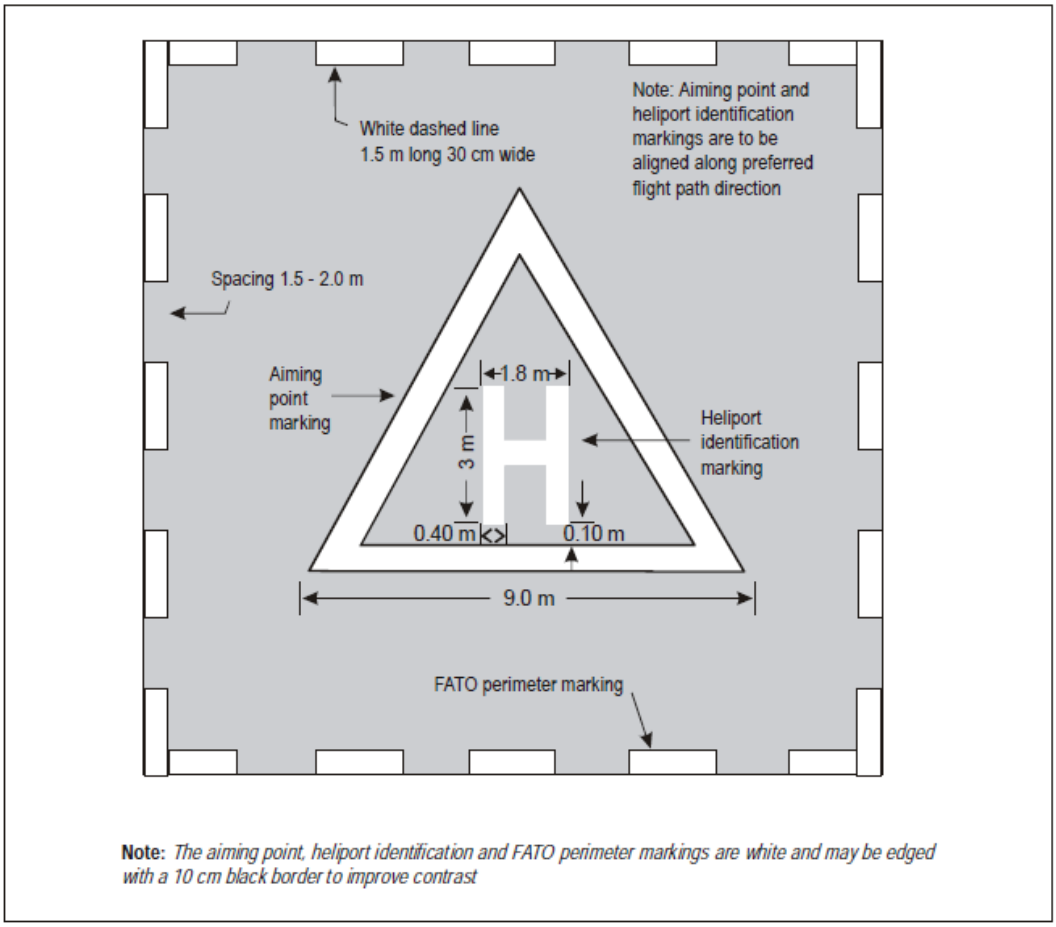


Figure F-1. Combined heliport identification, aiming point and FATO perimeter marking

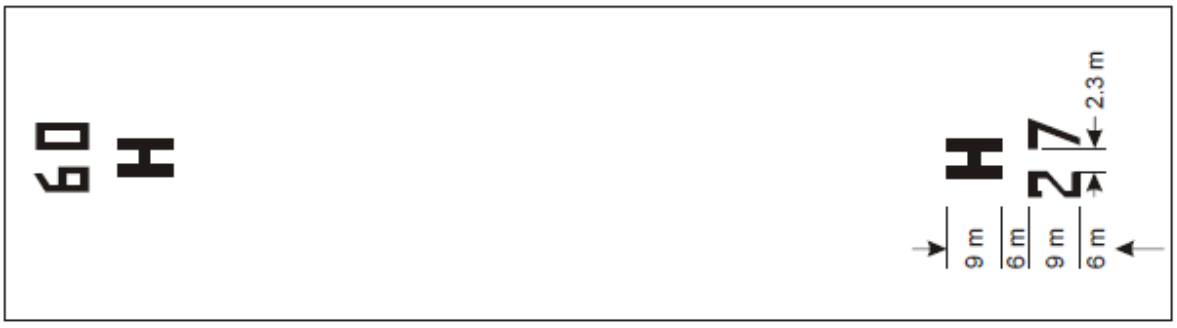


Figure F-2. FATO designation marking and heliport identification marking for a runway-type FATO

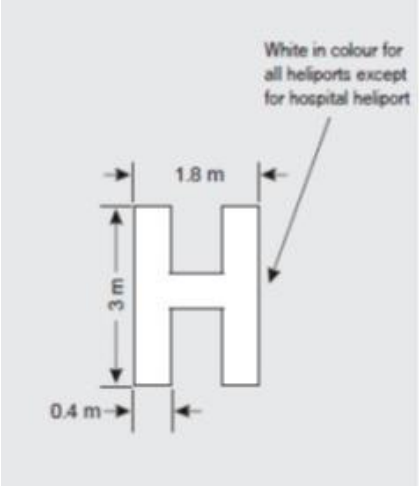


Figure F-3. Heliport identification marking

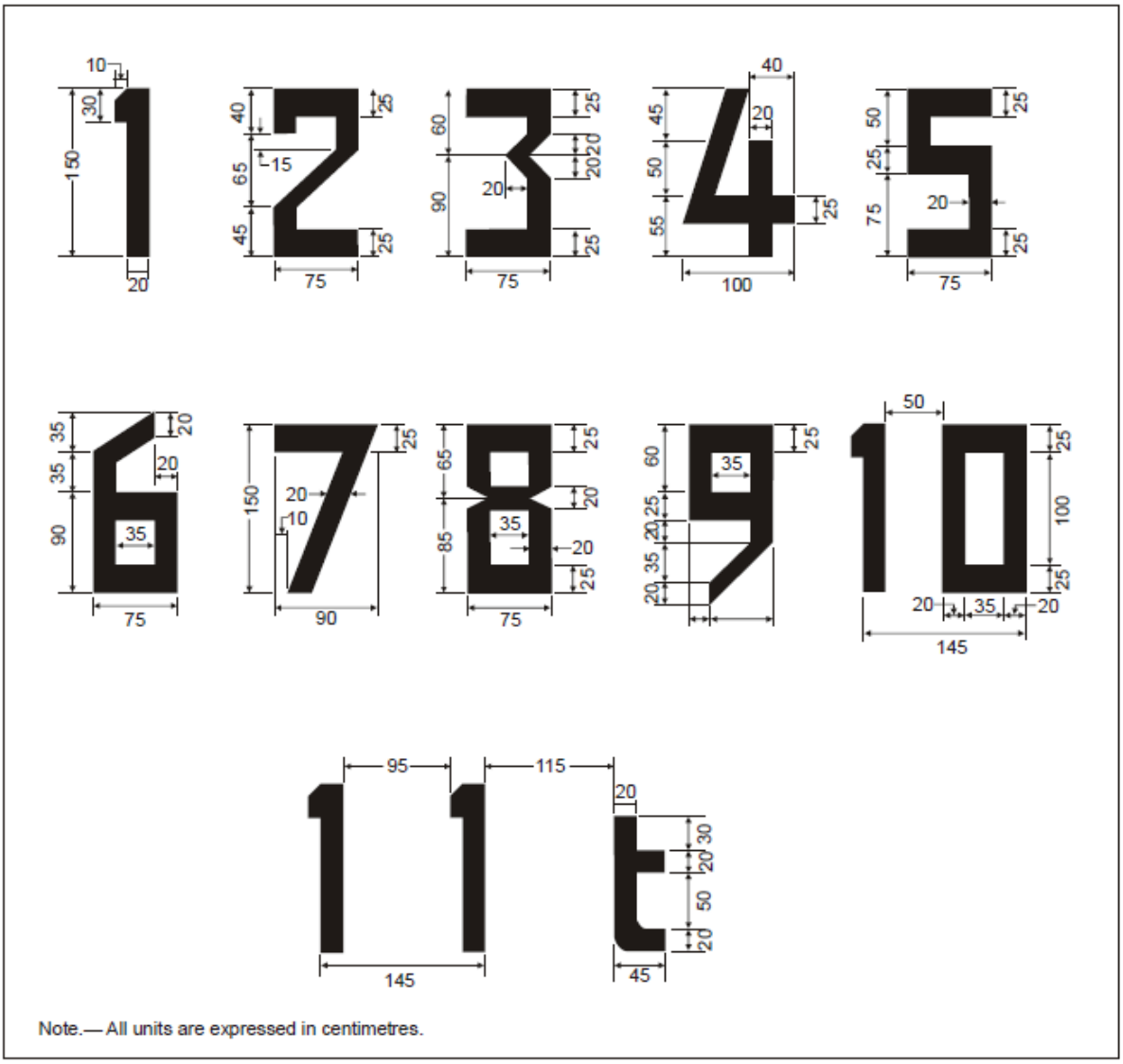


Figure F-4 Form and proportions of numbers and letters

CS HPT-DSN.F.530 Final approach and take-off area perimeter marking or markers

(a) Applicability: FATO perimeter marking or markers should be provided where the extent of the FATO is not self-evident.

(b) Location: The FATO perimeter marking or markers should be located on the edge of the FATO.

(c) Characteristics:

(1) For runway-type FATOs:

(i) The perimeter of the FATO should be defined with markings or markers spaced at equal intervals of not more than 50 m with at least three markings or markers on each side including a marking or marker at each corner.

(ii) A FATO perimeter marking should be a rectangular stripe with a length of 9 m or one-fifth of the side of the FATO which it defines and a width of 1 m.

(iii) FATO perimeter markings should be white.

(iv) FATO perimeter markers should be of colour(s) that contrast effectively against the operating background.

(2) For all FATOs except runway-type FATOs:

(i) For an unpaved FATO the perimeter should be defined with flush in-ground markers. The FATO perimeter markers should be 30 cm in width, 1.5 m in length, and with end-to-end spacing of not less than 1.5 m and not more than 2 m. The corners of a square or rectangular FATO should be defined.

(ii) For a paved FATO the perimeter should be defined with a dashed line. The FATO perimeter marking segments should be 30 cm in width, 1.5 m in length, and with end-to-end spacing of not less than 1.5 m and not more than 2 m. The corners of the square or rectangular FATO should be defined.

(iii) FATO perimeter markings and flush in-ground markers should be white.

CS HPT-DSN.F.540 Final approach and take-off area designation marking

(a) Applicability: A FATO designation marking should be provided on a runway-type FATO.

(b) Location: A FATO designation marking should be located at the beginning of the FATO (see Figure F-2).

(c) Characteristics: A FATO designation marking should consist of a two-digit number. The two-digit number should be the whole number nearest the one-tenth of the magnetic North when viewed from the direction of approach. When the above rule would give a single digit number, it should be preceded by a zero (see Figure F-2).

CS HPT-DSN.F.550 Aiming point marking.

(a) Applicability: The aiming point marking should be located within the runway-type FATO.

(b) The characteristics of the aiming point marking for a runway-type FATO should be as follows:

(i) The aiming point marking should be an equilateral triangle with a minimum side length of 9.0 metres, with the bisector of one of the angles aligned with the preferred approach direction.

(ii) The marking should consist of continuous white lines, 1.0 m in width (see Figures F-1).

CS HPT-DSN.F.560 Touchdown and lift-off area perimeter marking.

(a) Applicability: When the perimeter of the TLOF is not self-evident, a TLOF perimeter marking should be displayed on a TLOF located in a FATO.

(b) Location: The TLOF perimeter marking should be located along the edge of the TLOF.

(c) Characteristics: A TLOF perimeter marking should consist of a continuous white line with a width of at least 30 cm.

CS HPT-DSN F.570 Touchdown/positioning marking

(a) Applicability:

(1) A touchdown/positioning marking should be provided where it is necessary for a helicopter to touch down and/or be accurately positioned.

(2) A touchdown/positioning marking should be provided on a helicopter stand designed for turning.

(b) Location:

(1) A touchdown/positioning marking should be located so that when the pilot's seat is over the marking, the whole of the undercarriage should be within the TLOF and all parts of the helicopter should be clear of any obstacle by a safe margin.

(2) For a helicopter stand designed for hover turning, the touchdown/positioning marking should be located in the centre of the central zone (see Figure F-4).

(3) On a heliport the centre of the touchdown/positioning marking should be located at the centre of the TLOF, except the centre of the touchdown/positioning marking may be offset away from the centre of the TLOF where a safety assessment indicates such offsetting to be necessary and providing that a marking that is so offset would not adversely affect safety.

(c) Characteristics:

(1) A touchdown/positioning marking should be a yellow circle and have a line width of at least 0.5 m.

(2) The inner diameter of the touchdown/positioning marking should be 0.5 D of the largest helicopter the TLOF and/or the helicopter stand is intended to serve.

CS HPT-DSN.F.580 Heliport name marking.

(a) Applicability: A heliport name marking should be provided at a heliport where there is insufficient alternative means of visual identification.

(b) Characteristics: A heliport name marking should consist of the name or the alphanumeric designator of the heliport as used in radio (R/T) communications.

CS HPT-DSN.F.590 Helicopter ground taxiway markings and markers

(a) General:

(1) The specifications for runway-holding position markings defined in CS ADR-DSN.L.575 and for intermediate holding position marking defined in CS ADR-DSN.L.580 are equally applicable to taxiways intended for ground taxiing of helicopters.

(2) The centre line of a helicopter ground taxiway should be identified with a marking.

(3) The edges of a helicopter ground taxiway, if not self-evident, should be identified with markers or markings.

(b) Location:

(1) Helicopter ground taxiway markings should be along the centre line of a helicopter ground taxiway.

(2) Helicopter ground taxiway edge markers should be located at a distance of 0.5 m to 3 m beyond the edge of the helicopter ground taxiway.

(3) Where provided, helicopter ground taxiway edge markers should be spaced at intervals of not more than 15 m on each side of straight sections and 7.5 m on each side of curved sections with a minimum of four equally spaced markers per section.

(c) Characteristics

(1) A helicopter ground taxiway centre line marking should be a continuous yellow line 15 cm in width.

(2) Helicopter ground taxiway edge markings should be a continuous double yellow line, each 15 cm in width, and spaced 15 cm apart (nearest edge to nearest edge).

(3) A helicopter ground taxiway edge marker should not exceed the height of a plane originating at a height of 25 cm above the plane of the helicopter ground taxiway, at a distance of 0.5 m from the edge of the helicopter ground taxiway and sloping upwards and outwards at a gradient of 5 per cent to a distance of 3 m beyond the edge of the helicopter ground taxiway.

(4) A helicopter ground taxiway edge marker should be blue.

(5) If the helicopter ground taxiway is to be used at night, the edge markers should be internally illuminated or retro-reflective.

CS HPT-DSN F.600 Helicopter air taxiway markings and markers

(a) General: The specifications for runway-holding position markings defined in CS ADR-DSN.L.575 and intermediate holding position marking defined in CS ADR-DSN.L.580 are equally applicable to taxiways intended for air taxiing of helicopters.

(b) Applicability: The centre line of a helicopter air taxiway or, if not self-evident, the edges of a helicopter air taxiway, should be identified with markers or markings.

(c) Location:

(1) A helicopter air taxiway centre line marking or flush in-ground centre line marker should be located along the centre line of the helicopter air taxiway.

(2) Helicopter air taxiway edge markings should be located along the edges of a helicopter air taxiway.

(3) Helicopter air taxiway edge markers should be located at a distance of 1 m to 3 m beyond the edge of the helicopter air taxiway.

(d) Characteristics

(1) A helicopter air taxiway centre line should be marked with a continuous yellow line 15 cm in width, when on a paved surface.

(2) The edges of a helicopter air taxiway, when on a paved surface, should be marked with continuous double yellow lines each 15 cm in width, and spaced 15 cm apart (nearest edge to nearest edge).

(3) Where a helicopter air taxiway is located on an unpaved surface and painted markings of a helicopter air taxiway centre line cannot be provided, it should be marked with flush in-ground 15 cm wide and approximately 1.5 m in length yellow markers, spaced at intervals of not more than 30 m on straight sections and not more than 15 m on curves, with a minimum of four equally spaced markers per section.

(4) Helicopter air taxiway edge markers, where provided, should be spaced at intervals of not more than 30 m on each side of straight sections and not more than 15 m on each side of curves, with a minimum of four equally spaced markers per section.

(5) Helicopter air taxiway edge markers should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance of 1 m from the edge of the helicopter air taxiway and sloping upwards and outwards at a gradient of 5 per cent to a distance of 3 m beyond the edge of the helicopter air taxiway.

(6) A helicopter air taxiway edge marker should be of colour(s) that contrast effectively against the operating background. The red colour should not be used for markers.

(7) If the helicopter air taxiway is to be used at night, helicopter air taxiway edge markers should be either internally illuminated or retro-reflective.

CS HPT-DSN.F.610 Helicopter stand markings

(a) Applicability:

(1) A helicopter stand perimeter marking should be provided on a helicopter stand designed for turning. If a helicopter stand perimeter marking is not practicable, a central zone perimeter marking should be provided instead if the perimeter of the central zone is not self-evident.

(2) For a helicopter stand that is intended to be used for taxi-through and which does not allow a helicopter to turn, a stop line should be provided.

(3) Alignment lines and lead-in/lead-out lines should be provided on a helicopter stand (see Figures F-5 and F-5a).

(b) Location:

(1) A helicopter stand perimeter marking on a helicopter stand designed for turning or, a central zone perimeter marking, should be concentric with the central zone of the stand.

(2) For a helicopter stand that is intended to be used for taxi-through and which does not allow the helicopter to turn, a stop line should be located on the helicopter ground taxiway axis at right angles to the centre line.

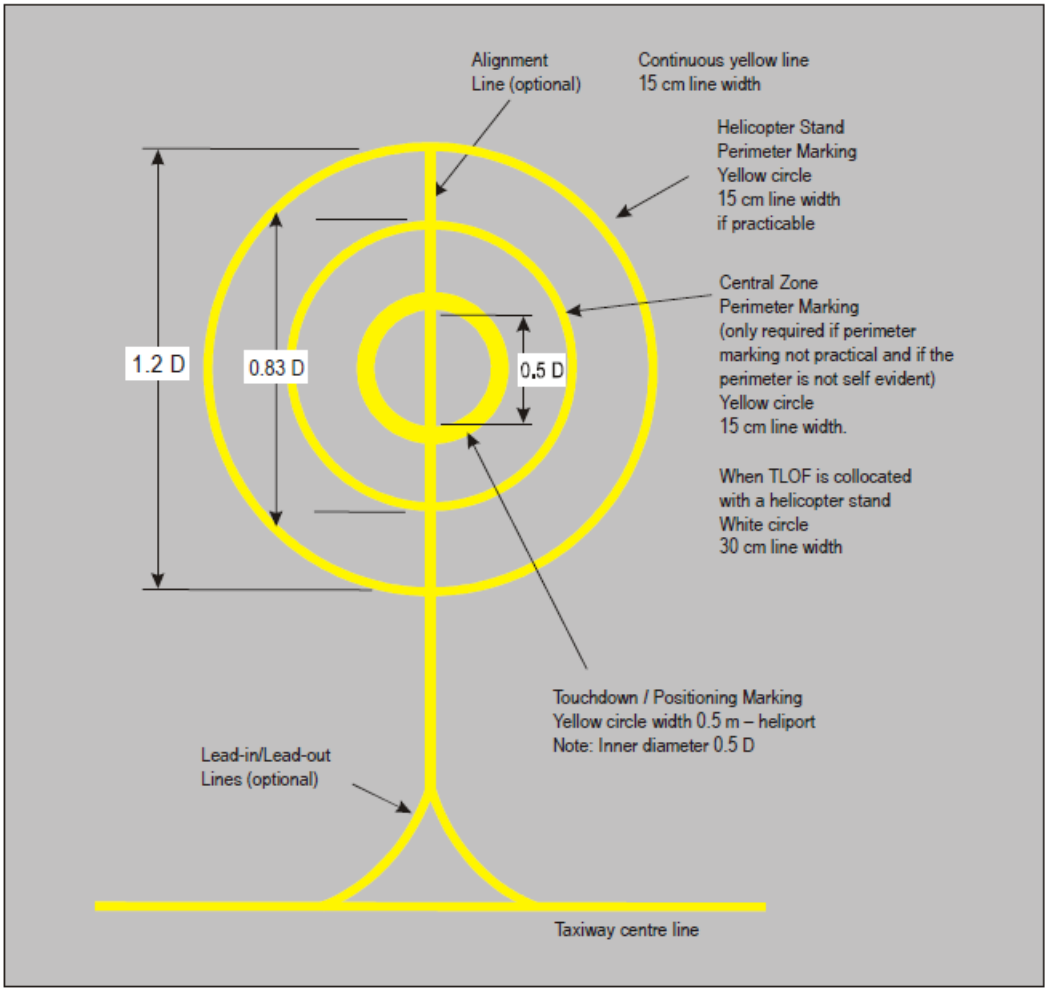


Figure F-5. Helicopter stand markings

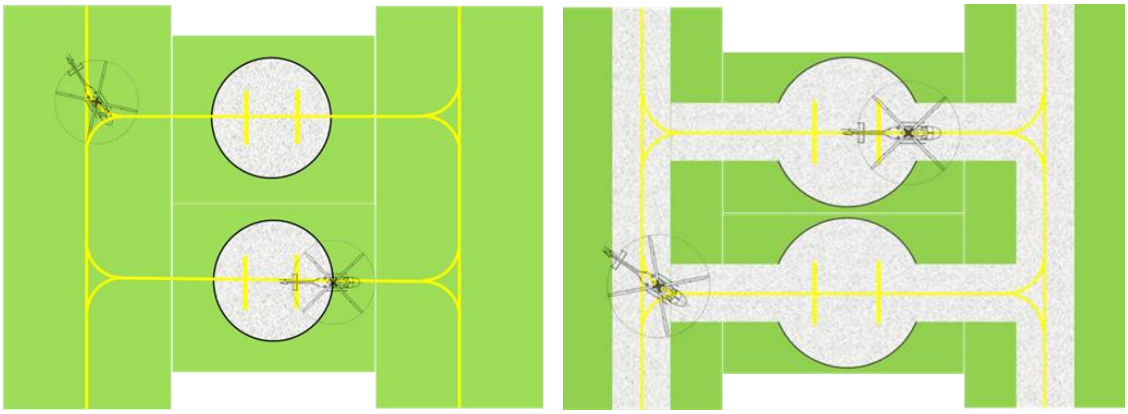


Figure F-5a. Taxi through helicopter stand markings

(c) Characteristics:

(1) A helicopter stand perimeter marking should be a yellow circle and have a line width of 15 cm.

(2) A central zone perimeter marking should be a yellow circle and have a line width of 15 cm, except when the TLOF is collocated with a helicopter stand, in which case the characteristics of the TLOF perimeter markings should apply.

(3) For a helicopter stand that is intended to be used for taxi-through and which does not allow the helicopter to turn, the yellow stop line should not be less than the width of the helicopter ground taxiway and should have a line thickness of 50 cm.

(4) Alignment lines and lead-in/lead-out lines should be continuous yellow lines and should have a width of 15 cm.

(5) Curved portions of alignment lines and lead-in/lead-out lines should have radii appropriate to the most demanding helicopter type the helicopter stand is intended to serve.

(6) Stand identification markings should be marked in a contrasting colour so as to be easily readable.

(7) Where it is intended that helicopters proceed in one direction only, arrows indicating the direction to be followed may be added as part of the alignment lines.

CS HPT-DSN.F.620 Flight path alignment guidance marking

(a) Where practicable, a flight path alignment guidance marking(s) should be provided at a heliport to indicate available approach and/or departure path direction(s).

CS HPT-DSN.F.630 Approach lighting system

(a) Where practicable, an approach lighting system should be provided at a heliport to indicate a preferred approach direction.

CS HPT-DSN.F.640 Flight path alignment guidance lighting system

(a) Where practicable, a flight path alignment guidance lighting system(s) should be provided at a heliport to indicate available approach and/or departure path direction(s).

CS HPT-DSN.F.650 Visual alignment guidance system

(a) Safety objective of a visual alignment guidance system is to provide guidance to the pilot during the approach to a heliport.

(b) Applicability: A visual alignment guidance system should be provided where one or more of the following conditions exist:

(1) obstacle clearance, noise abatement or traffic control procedures require a particular direction to be flown;

(2) the environment of the heliport provides few visual surface cues; and

(3) it is physically impracticable to install an approach lighting system.

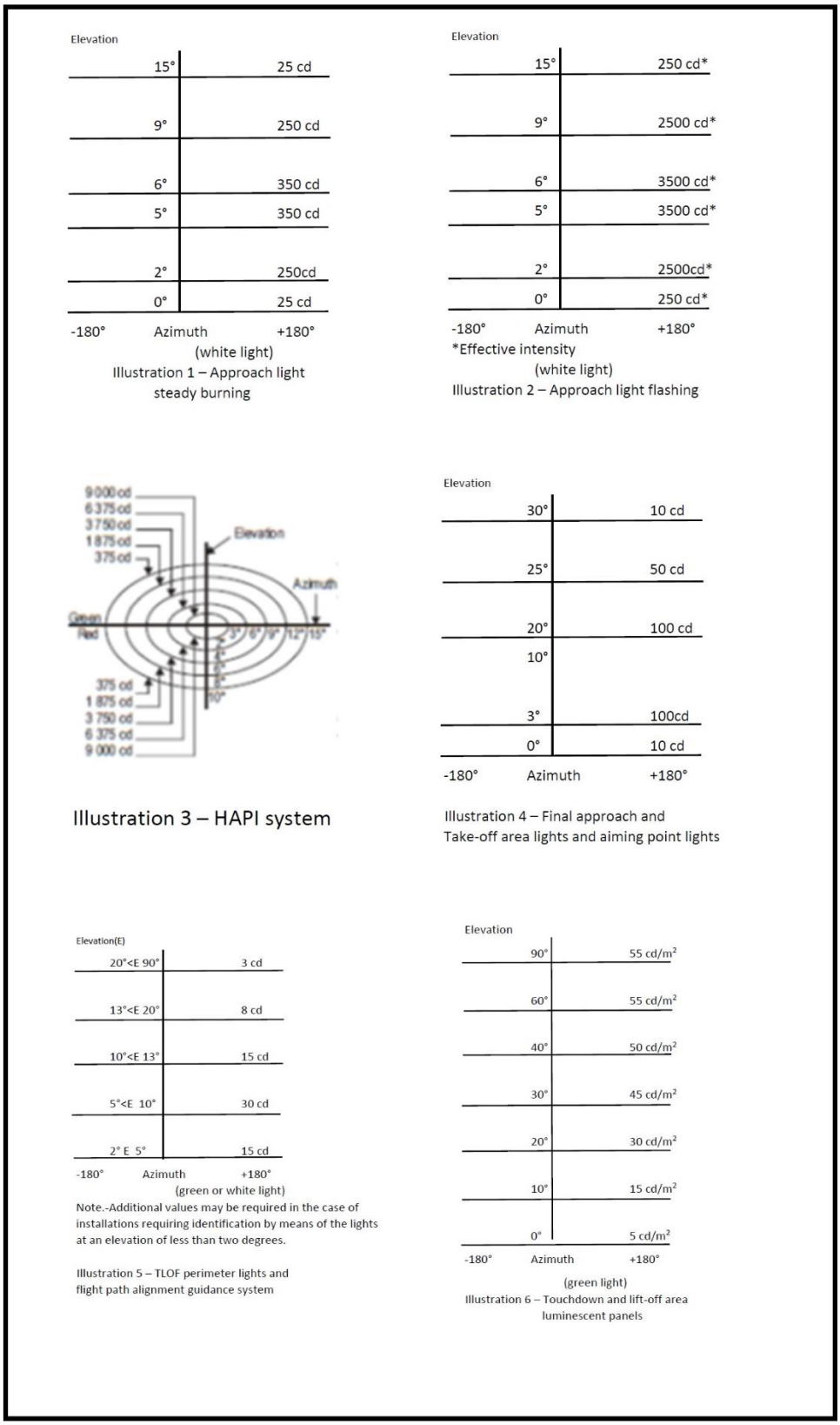


Figure F-6. Isocandela diagrams

SURFACE AND DIMENSIONS	FATO	
Length of inner edge	Width of safety area	
Distance from end of FATO	3 m minimum	
Divergence	10%	
Total length	2 500 m	
Slope	PAPI	A[a] – 0.57°
	HAPI	A[b] – 0.65°
	APAPI	A[a] – 0.9°

a. As indicated in CS ADR-DSN.M.645 Table M-4
b. The angle of the upper boundary of the "below slope" signal.

Table F-1. Dimensions and slopes of the obstacle protection surface for heliport visual approach indicator system

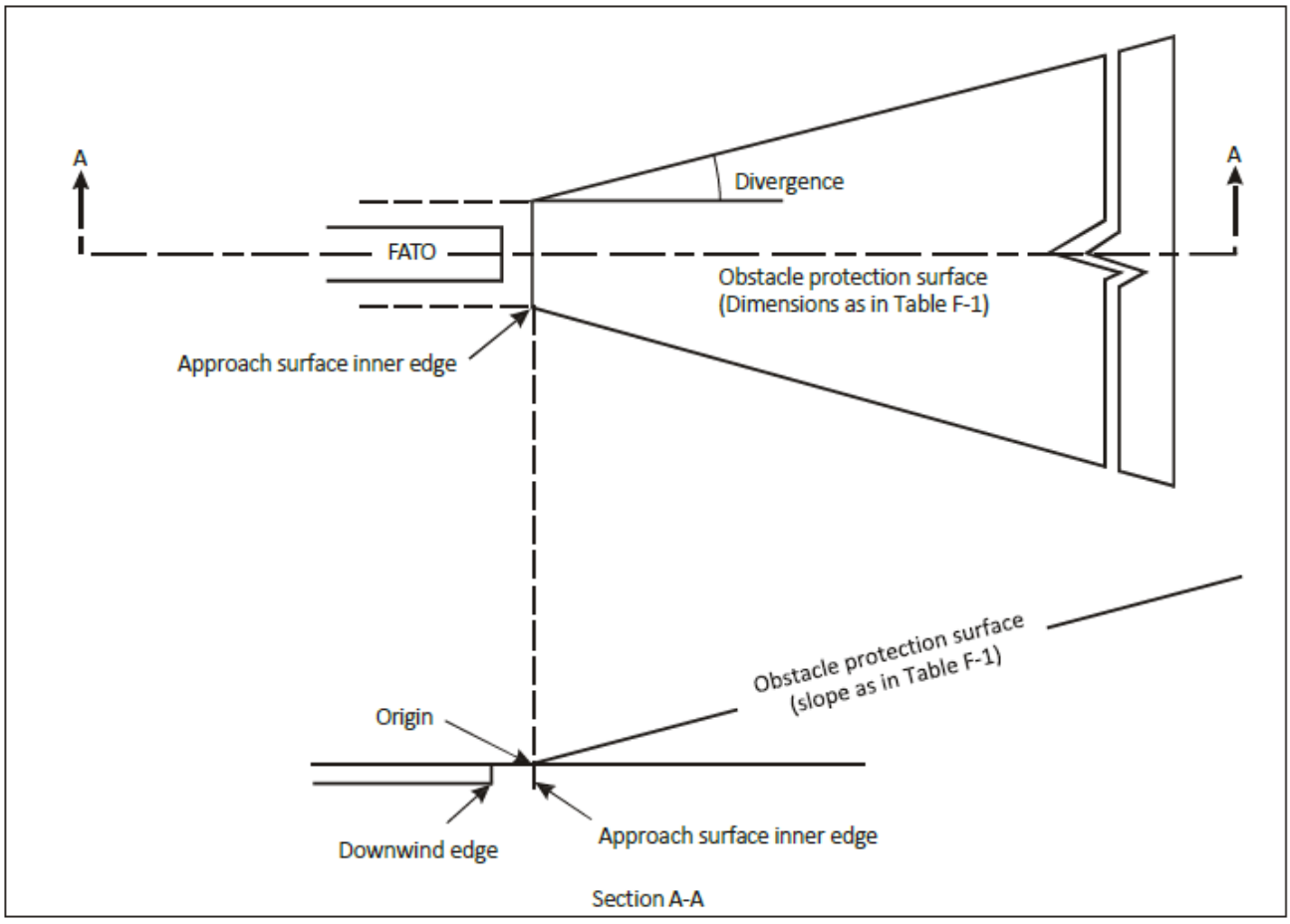


Figure F-7. Obstacle protection surface for visual approach slope indicator systems

CS HPT-DSN.F.660 Heliport visual approach slope indicator

(a) Applicability: A heliport visual approach slope indicator should be provided for a heliport where one or more of the following conditions exist:

(1) obstacle clearance, noise abatement or traffic control procedures require a particular slope to be flown;

(2) the environment of the heliport provides few visual surface cues; and

(3) the characteristics of the helicopter require a stabilised approach.

(b) The standard heliport visual approach slope indicator systems for helicopter operations should consist of the following:

(1) PAPI (precision approach path indicator) and APAPI (abbreviated precision approach path indicator) systems conforming to the specifications contained in CS ADR-DSN.M.645 and CS ADR-DSN.M.650, except that the angular size of the on-slope sector of the systems should be increased to 45 minutes of arc or

(2) HAPI (helicopter approach path indicator) system conforming to the specifications in sections (d) to (g) below.

(c) Location:

(1) A heliport visual approach slope indicator should be located such that a helicopter is guided to the desired position within the FATO and so as to avoid dazzling the pilot during final approach and landing.

(2) The light unit(s) should be mounted as low as possible.

(d) Characteristics of the HAPI signal format:

(1) The signal format of the HAPI should include four discrete signal sectors, providing an 'above slope', an 'on slope', a 'slightly below' and a 'below slope' signal.

(2) The signal format of the HAPI should be as shown in Figure F-8, Illustrations A and B.

(3) The signal repetition rate of the flashing sector of the HAPI should be at least 2 Hz.

(4) The on-to-off ratio of pulsing signals of the HAPI should be 1 to 1, and the modulation depth should be at least 80 per cent.

(5) The angular size of the 'on-slope' sector of the HAPI should be 45 minutes of arc.

(6) The angular size of the 'slightly below' sector of the HAPI should be 15 minutes of arc.

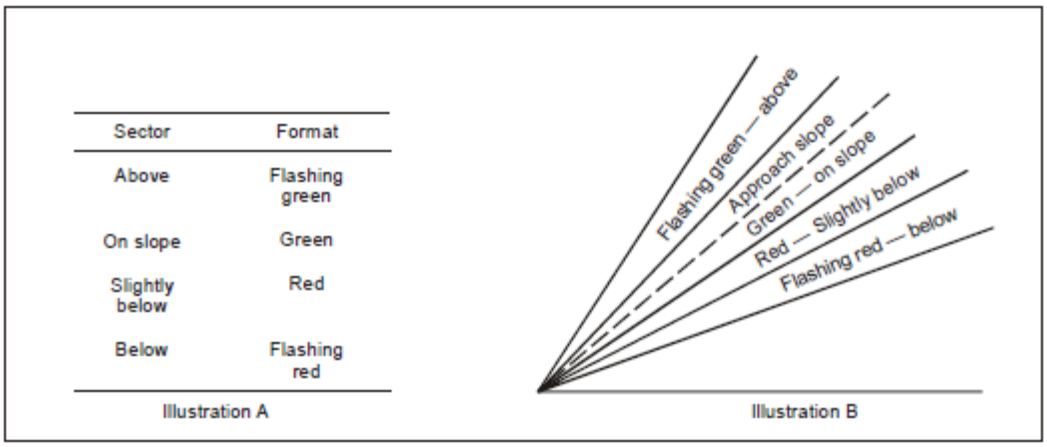


Figure F-8. HAPI signal format

(e) Light distribution:

(1) The light intensity distribution of the HAPI in red and green colours should be as shown in Figure F-6, Illustration 3.

(2) The colour transition of the HAPI in the vertical plane should be such as to appear to an observer at a distance of not less than 300 m to occur within a vertical angle of not more than three minutes of arc.

(3) The transmission factor of a red or green filter should be not less than 15 per cent at the maximum intensity setting.

(4) At full intensity the red light of the HAPI should have a Y-coordinate not exceeding 0.320, and the green light should be within the boundaries specified in CS ADR-DSN.U.930 (b).

(5) A suitable intensity control should be provided so as to allow adjustment to meet the prevailing conditions and to avoid dazzling the pilot during approach and landing.

(f) Approach slope and elevation setting:

(1) A HAPI system should be capable of adjustment in elevation at any desired angle between 1 degree and 12 degrees above the horizontal with an accuracy of ± 5 minutes of arc.

(2) The angle of elevation setting of a HAPI should be such that during an approach, the pilot of a helicopter observing the upper boundary of the 'below slope' signal would clear all objects in the approach area by a safe margin.

(g) Characteristics of the light unit:

(1) The system should be so designed that:

(i) in the event the vertical misalignment of a unit exceeds ± 0.5 degrees (± 30 minutes), the system should switch off automatically; and

(ii) if the flashing mechanism fails, no light is emitted in the failed flashing sector(s).

(2) The light unit of the HAPI should be so designed that deposits of condensation, ice, dirt, etc., on optically transmitting or reflecting surfaces would interfere to the least possible extent with the light signal and should not cause spurious or false signals to be generated.

(h) Obstacle protection surface (applicable to PAPI, APAPI and HAPI):

(1) An obstacle protection surface should be established when it is intended to provide a visual approach slope indicator system.

(2) The characteristics of the obstacle protection surface, i.e. origin, divergence, length and slope, should correspond to those specified in the relevant column of Table F-1 and in Figure F-7.

(3) New objects or extensions of existing objects should not be permitted above an obstacle protection surface except when, the new object or extension would be shielded by an existing immovable object.

(4) Existing objects above an obstacle protection surface should be removed except when, the object is shielded by an existing immovable object, or after a safety assessment it is determined that the object would not adversely affect the safety of operations of helicopters.

(5) Where a safety assessment indicates that an existing object extending above an obstacle protection surface could adversely affect the safety of operations of helicopters, one or more of the following measures should be taken:

(i) suitably raise the approach slope of the system;

(ii) reduce the azimuth spread of the system so that the object is outside the confines of the beam;

(iii) displace the axis of the system and its associated obstacle protection surface by no more than 5 degrees;

(iv) suitably displace the FATO; and

(v) install a visual alignment guidance system.

CS HPT-DSN.F.670 Final approach and take-off area lighting systems

(a) Applicability: FATO lights should be provided where a FATO is established at a heliport intended for use at night. They can be omitted where the FATO and the TLOF are nearly coincidental and TLOF lights are provided, or the extent of the FATO is self-evident.

(b) Location: FATO lights should be placed along the edges of the FATO. The lights should be uniformly spaced as follows:
(1) for an area in the form of a square or rectangle, at intervals of not more than 50 m with a minimum of four lights on each side including a light at each corner; and
(2) for any other shaped area, including a circular area, at intervals of not more than 5 m with a minimum of ten lights.

(c) Characteristics:
(1) FATO lights should be fixed omnidirectional lights showing white. Where the intensity of the lights is to be varied the lights should show variable white.
(2) The light distribution of FATO lights should be as shown in Figure F-6, Illustration 4.

(3) The lights should not exceed a height of 25 cm and should be inset when a light extending above the surface would endanger helicopter operations.

(4) Where a FATO is not meant for lift-off or touchdown, the lights should not exceed a height of 25 cm above ground or snow level.

CS HPT-DSN.F.680 Aiming point lights

(a) Applicability: Aiming point lights should be provided where an aiming point marking is provided at a heliport intended for use at night.

(b) Location: Aiming point lights should be collocated with the aiming point marking.

(c) Characteristics:

(1) Aiming point lights should form a pattern of at least six omnidirectional white lights (see Figure F-9).

(2) The lights should be inset when a light extending above the surface could endanger helicopter operations.

(3) The light distribution of aiming point lights should be as shown in Figure F-6, Illustration 4.

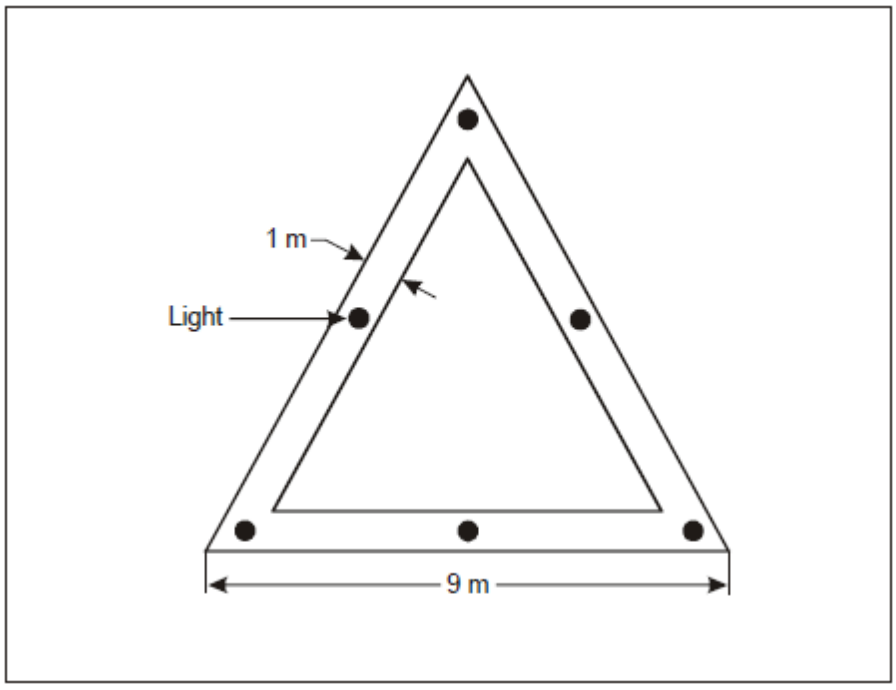


Figure F-9. Aiming point marking and lighting

CS HPT-DSN.F.690 Touchdown and lift-off area lighting system

(a) Applicability:

(1) A TLOF lighting system should be provided at a heliport intended for use at night.

(2) The TLOF lighting system for a heliport should consist of one or more of the following:

(i) perimeter lights; or

(ii) floodlighting; or

(iii) arrays of segmented point source lighting (ASPSL) or luminescent panel (LP) lighting to identify the TLOF when (i) and (ii) are not practicable and FATO lights are available.

(b) Location:

(1) TLOF perimeter lights should be placed along the edge of the area designated for use as the TLOF or within a distance of 1.5 m from the edge.

(2) Where the TLOF is a circle, the lights should be:

(i) located on straight lines in a pattern which should provide information to pilots on drift displacement; or

(ii) evenly spaced around the perimeter of the TLOF at the appropriate intervals, sufficient to present the pattern, except that over a sector of 45 degrees, the lights should be spaced at half spacing.

(3) TLOF perimeter lights should be uniformly spaced at intervals of not more than 5 m.

(4) There should be a minimum number of four lights on each side, including a light at each corner.

(5) For a circular TLOF, where lights are installed in accordance with paragraph (1) above, there should be a minimum of fourteen lights.

(6) ASPSL or LPs, if provided to identify the TLOF, should be placed along the marking designating the edge of the TLOF.

(7) Where the TLOF is a circle, the ASPSL or LPs should be located on straight lines circumscribing the area.

(8) The minimum number of LPs on a TLOF should be nine.

(9) The total length of LPs in a pattern should not be less than 50 per cent of the length of the pattern.

(10) There should be an odd number of panels with a minimum number of three panels on each side of the TLOF, including a panel at each corner.

(11) LPs should be uniformly spaced with a distance between adjacent panel ends of not more than 5 m on each side of the TLOF.

(12) TLOF floodlights should be located so as to avoid glare to pilots in flight or to personnel working on the area.

(13) The arrangement and aiming of floodlights should be such that shadows are kept to a minimum.

(c) Characteristics:

(1) The TLOF perimeter lights should be fixed omnidirectional lights showing green.

(2) ASPSL or LPs should emit green light when used to define the perimeter of the TLOF.

(3) The chromaticity and luminance of colours of LPs should be in accordance with the specifications in CS ADR-DSN.U.935.

(4) An LP should have a minimum width of 6 cm. The panel housing should be the same colour as the marking it defines.

(5) The perimeter lights should not exceed a height of 25 cm and should be inset when a light extending above the surface could endanger helicopter operations.

(6) When located within the safety area of a heliport, the TLOF floodlights should not exceed a height of 25 cm.

(7) The LPs should not extend above the surface by more than 2.5 cm.

(8) The light distribution of the perimeter lights should be as shown in Figure F-6, Illustration 5.

(9) The light distribution of the LPs should be as shown in Figure F-6, Illustration 6.

(10) The spectral distribution of TLOF area floodlights should be such that the surface and obstacle marking can be correctly identified.

(11) The average horizontal illuminance of the floodlighting should be at least 10 lux, with a uniformity ratio (average to minimum) of not more than 8:1 measured on the surface of the TLOF.

(12) The lighting used to identify the touchdown marking should comprise a segmented circle of omnidirectional ASPSL strips showing yellow. The segments should consist of ASPSL strips, and the total length of the ASPSL strips should not be less than 50 per cent of the circumference of the circle.

(13) If utilized, the heliport identification marking lighting should be omnidirectional showing green.

CS HPT-DSN.F.700 Taxiway lights

(a) CS ADR-DSN.M.710, CS ADR-DSN.M.715 and CS ADR-DSN.M.720 are applicable to taxiways intended for ground taxiing of helicopters.

CS HPT-DSN.F.710 Visual aids for denoting obstacles

(a) Obstacles should be marked and lit in accordance with CS ADR-DSN.Q.840, CS ADR-DSN.Q.845 and CS ADR-DSN.Q.850.

3.2. Draft guidance material (BOOK 2)

CHAPTER A — GENERAL

GM1 HPT-DSN.A.010 Applicability

The certification specifications of Book 1 and the guidance material of Book 2 are applicable to all surface-level VFR heliports located at aerodromes that fall under the scope of Regulation (EC) 216/2008, including those that are not open for public use or for commercial air transport.

CHAPTER B — HELICOPTER OPERATING AREAS

GM1 HPT-DSN.B.100 Final Approach and Take-Off Areas (FATO)

(a) General:

(1) No more than one helicopter should be in the FATO at the same time.

(2) Where a FATO is located near a runway or taxiway, and when simultaneous helicopter and aeroplane operations are planned, the separation distance between the edge of a runway or taxiway and the edge of a FATO should not be less than the appropriate dimension in Table GM1-B-1.

(b) Location: Operational limitations should be considered under certain wind conditions.

If aeroplane mass and/or helicopter mass are	Distance between FATO edge and runway edge or taxiway edge
up to but not including 3 175 kg	60 m
3 175 kg up to but not including 5 760 kg	120 m
5 760 kg up to but not including 100 000 kg	180 m
100 000 kg and over	250 m

Table GM1-B-1. FATO minimum separation distance.

(c) The surface of the FATO should be constructed so as to provide ground effect.

(d) A FATO should not be located:

(1) near taxiway intersections or holding points where jet engine efflux is likely to cause high turbulence; or

(2) near areas where aeroplane vortex wake generation is likely to occur.

GM1 HPT-DSN.B.110 Helicopter clearways

(a) General: A helicopter clearway would need to be considered when the heliport is intended to be used by helicopters operating in performance class 1.

(b) Characteristics:

(1) The width of a helicopter clearway should not be less than that of the associated safety area.

(2) An object situated in a helicopter clearway, which may endanger helicopters in the air, should be regarded as an obstacle and should be removed.

(3) The slope of a helicopter clearway should not project above a plane having an upward slope of 3 per cent, commencing at the periphery of the FATO.

GM1 HPT-DSN.B.120 Touchdown and lift-off areas (TLOF)

(a) A TLOF may be of any shape.

GM1 HPT-DSN.B.130 Safety areas

(a) When only a single approach and take-off climb surface is provided, the need for specific protected side slopes should be addressed in a safety assessment.

(b) Objects whose function requires them to be located on the safety area at a distance of more than 0.75 D from the centre of the FATO, should not penetrate a plane originating at a height of 25 cm above the plane of the FATO and sloping upwards and outwards at a gradient of 5 per cent.

CHAPTER C — HELICOPTER TAXIWAYS AND TAXI-ROUTES

GM1 HPT-DSN.C.200 Helicopter ground taxiways and helicopter ground taxi-routes

(a) General: When a taxiway is intended for use by aeroplanes and helicopters, the provisions for aeroplane and helicopter ground taxiways should be taken into consideration and the more stringent requirements should be applied.

CHAPTER D — HELICOPTER STANDS

GM1 HPT-DSN.D.300 Helicopter stands

(a) General:

(1) The provisions of this section do not specify where helicopter stands should be located, rather they allow flexibility in the overall design of a heliport.

(2) It is not considered good practice to locate helicopter stands under a flight path.

(b) Characteristics:

(c) For a helicopter stand intended to be used by wheeled helicopters for turning on the ground, the dimension of the helicopter stand and the protection area, including the dimension of the central zone, would need to be significantly increased.

(1) A helicopter stand and associated protection area intended to be used for air taxiing should provide ground effect.

(2) The separation distance between helicopter stands may be reduced by adopting a supplementary overlap of the protection area until a safety margin of 0.4 D is reached (see Figure GM D-1). For such a configuration, all the following conditions should be fulfilled:

(i) This reduction in separation distance is valid for adjacent stands used by helicopter operators approved by the aerodrome operator;

(ii) A specific instruction to pilots is required;

(iii) Helicopters need to be parked according to the orientation of the yellow 'H';

(iv) Stands should be located on the same axis and marked accordingly (touchdown and positioning; yellow 'H'; stand number);

(v) No simultaneous hover operations are allowed.

The reduced separation distance may be used, where a safety assessment indicates that the safety of operations will not be endangered.

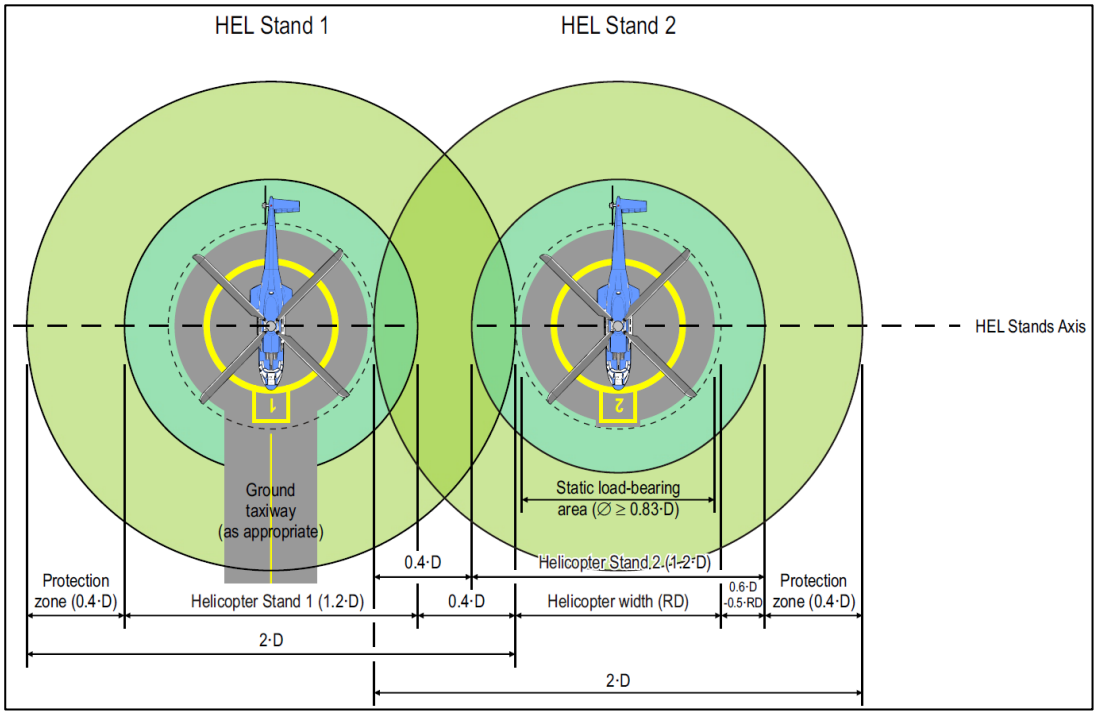


Figure GM D-1. Reduced separation distance between helicopter stands

CHAPTER E – Obstacle limitation surfaces and requirements

GM1 HPT-DSN.E.410 Approach surface

(a) Consultations with helicopter operators could assist the aerodrome operator in determining the appropriate slope category to apply according to the heliport environment and the most critical helicopter type for which the heliport is intended.

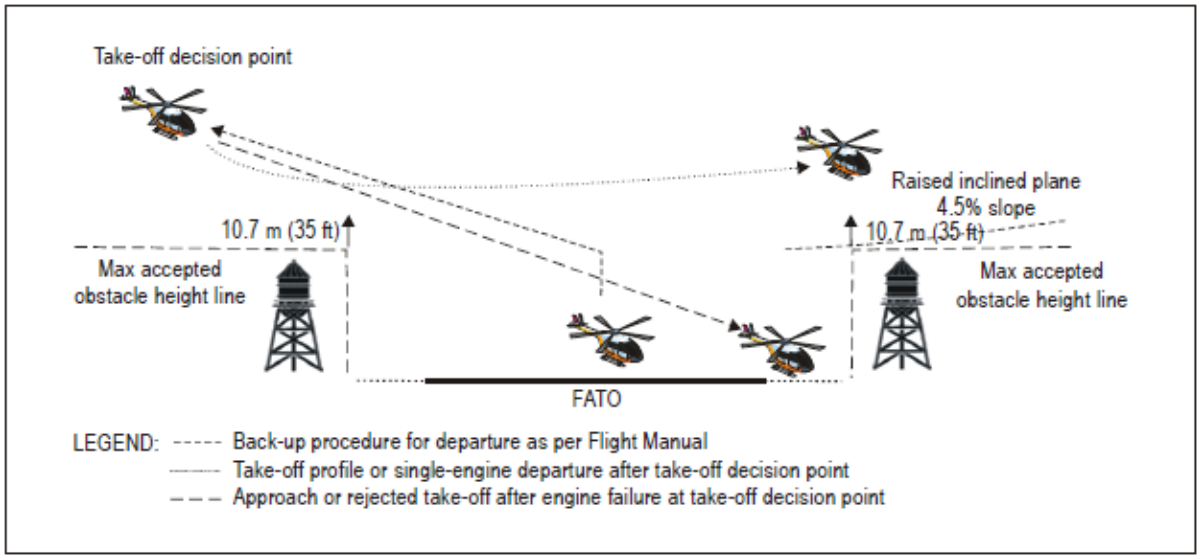


Figure GM1 E-1. Example of raised inclined plane during operations in Performance Class 1

(b) The example shown in see Figure GM E-1 does not represent any specific profile, technique or helicopter type and is intended to show a generic example. An approach profile and a back-up procedure for departure profile are depicted. Specific manufacturers operations in performance class 1 may be represented differently in the specific helicopter flight manual (AFM).

(c) The approach/landing profile may not be the reverse of the take-off profile.

(d) Additional safety assessment for obstacles might be required in the area that a back-up procedure is intended. Helicopter performance and the helicopter flight manual limitations would determine the extent of the assessment required.

(e) For heliports intended to be used by helicopters operated in performance class 2 and 3, it is good practice for the approach paths to be selected so as to permit safe forced landing or one-engine-inoperative landings such that, as a minimum requirement, injury to persons on the ground or water or damage to property are minimised. The most critical helicopter type for which the heliport is intended and the ambient conditions may be factors in determining the suitability of such areas.

(f) The following supplementary parameters may be considered when designing the approach surfaces, if a safety assessment indicates that they would not affect the safe operation of helicopters and/or aeroplanes:

(1) More than one turn is possible, if an appropriate straight section is provided between two turns;

(2) The first straight section, starting from the safety area, can be reduced to a minimum of 150 m in length;

(3) Every turn should have a minimum radius of 270 m;

(g) The approach and take-off surfaces should be offset from each other by an angle of not less than 135 degrees.

GM1 HPT-DSN.E.420 Take-off climb surface

(a) Helicopter take-off performance is reduced in a curve, so a straight portion along the take-off climb surface prior to the start of the curve allows for acceleration.

(b) For heliports intended to be used by helicopters operated in performance class 2 and 3, it is an operational requirement for departure paths to be selected so as to permit safe forced landings or one-engine-inoperative landings such that, injury to persons on the ground or damage to property are minimized. The most critical helicopter type for which the heliport is intended and the ambient conditions may be factors in determining the suitability of such areas.

(c) The following supplementary aspects may be considered when designing the take-off surfaces, if a safety assessment indicates that they would not affect the safe operation of helicopters and/or aeroplanes:

(1) More than one turn is possible, if an appropriate straight section is provided between two turns;

(2) The first straight section, starting from the safety area, can be reduced to a minimum of 150 m in length;

(3) Every turn should have a minimum radius of 270 m;

(d) The approach and take-off surfaces should be offset from each other by an angle of not less than 135 degrees.

CHAPTER F — VISUAL AIDS

GM1 HPT-DSN F.500 General:

(a) When a runway is marked in accordance with the provisions of CS-ADR-DSN, and is utilised as a FATO, no additional runway markings or lighting are required for helicopter use.

GM1 HPT-DSN.F.510 Wind direction indicators

(a) General: If the wind direction indicators serving the aerodrome do not clearly indicate the correct wind information at the heliport, additional wind direction indicators should be installed in order to provide wind information to the pilot during approach and take-off.

(b) Location: A wind direction indicator should be located so as to indicate the wind conditions over the FATO and TLOF and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It should be visible from a helicopter in flight, in a hover or on the movement area.

(c) Where a TLOF and/or FATO are subject to a disturbed airflow, additional wind direction indicators located close to the area should be provided to indicate the surface wind on the area.

(d) Characteristics: A wind direction indicator should give a clear indication of the direction of the wind and a general indication of the wind speed.

(e) A wind direction indicator for the heliport should be a truncated cone made of lightweight fabric and should have the following minimum dimensions:

(1) Length 2.4 m,

(2) Diameter (larger end) 0.6 m, and

(3) Diameter (smaller end) 0.3 m.

(f) The colour of the wind direction indicator should be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft) above the heliport.

(g) Regarding the background:

(1) Where practicable, a single colour, preferably white or orange, should be used;

(2) Where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands the first and last band being the darker colour.

(h) A wind direction indicator at a heliport intended for use at night should be illuminated.

GM1 HPT-DSN.F.520 Heliport identification marking

(a) Characteristics of markings for all FATOs except runway-type FATOs may be as follows:
(1) The numbers and the letter of the marking should have a colour contrasting with the background and should be in the form and proportion shown in Figure F-4 for a FATO with a dimension of more than 30 m.
(2) For a FATO with a dimension of between 15 m and 30 m the height of the numbers and the letter of the marking should be a minimum of 90 cm.
(3) For a FATO with a dimension of less than 15 m the height of the numbers and the letter of the marking should be a minimum of 60 cm, each with a proportional reduction in width and thickness.

GM1 HPT-DSN.F.530 Final approach and take-off area perimeter marking or markers

(a) Where a TLOF is coincident with a FATO, the TLOF marking can be used.

(b) FATO perimeter markers should be of a single colour, either orange or red, or the two contrasting colours of orange and white or, alternatively, red and white should be used except where such colours would merge with the background (see Figure GM1 F-1).

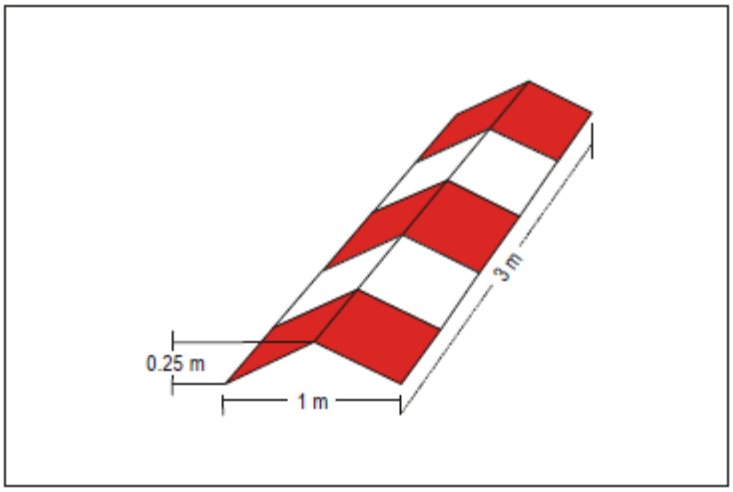


Figure GM1 F-1. Runway-type FATO edge marker

GM1 HPT-DSN.F.540 Final approach and take-off area designation marking

(a) Runway-type FATOs: A FATO designation marking should be provided at a heliport where it is necessary to designate the FATO to the pilot.

GM1 HPT-DSN.F.550 Aiming point marking.

(a) General: An aiming point marking should be provided at a heliport where it is necessary to make an approach to a particular point above a FATO before proceeding to a TLOF.

(b) Location: For all FATOs except runway-type FATOs the aiming point marking should be located at the centre of the FATO, as shown in Figure F-1.

GM1 HPT-DSN.F.560 Touchdown and lift-off area perimeter marking

A TLOF perimeter marking should be provided on each TLOF collocated with a helicopter stand.

GM1 HPT-DSN.F.580 Heliport name marking

(a) Location: The heliport name marking should be displayed on the heliport so as to be visible, as far as practicable, at all angles above the horizontal.

(b) Characteristics:

(1) A heliport name marking intended for use at night or during conditions of poor visibility should be illuminated, either internally or externally.

(2) The colour of the marking should contrast with the background and preferably be white.

(3) Runway-type FATOs: The characters of the marking should be not less than 3 m in height.

(4) All FATOs except runway-type FATOs: The characters of the marking should be not less than 1.5 m in height.

GM1 HPT-DSN.F.590 Helicopter ground taxiway markings and markers

(a) Ground taxi-routes are not required to be marked.

(b) Where necessary, signage should be provided on an aerodrome to indicate that a ground taxiway is suitable only for the use of helicopters.

(c) A helicopter ground taxiway edge marker should not present a hazard for aircraft operations.

GM1 HPT-DSN F.600 Helicopter air taxiway markings and markers

(a) Air taxi-routes are not required to be marked.
(b) Where a helicopter air taxiway could be confused with a helicopter ground taxiway, signage should be provided to indicate the mode of taxi operations that are permitted.
(c) Helicopter air taxiway edge markers should not be located at a distance from the centre line of the helicopter air taxiway of less than 0.5 times the largest overall width of the helicopter for which it is designed.
(d) Helicopter air taxiway edge markers should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance from the centre line of the helicopter air taxiway of 0.5 times the largest overall width of the helicopter for which it is designed, and sloping upwards and outwards at a gradient of 5 per cent.

GM1 HEL-DSN.F.610 Helicopter stand markings

(a) Helicopter stand identification markings may be provided where there is a need to identify individual stands.

(b) Helicopter stand identification markings should be marked in a contrasting colour so as to be easily readable.

GM1 HPT-DSN.F.620 Flight path alignment guidance marking

(a) Location: The flight path alignment guidance marking should be located in a straight line along the direction of approach and/or departure path on one or more of the TLOF, FATO, safety area or any suitable surface in the immediate vicinity of the FATO or the safety area.

(b) Characteristics:

(1) A flight path alignment guidance marking should consist of one or more arrows marked on the TLOF, FATO and/or safety area surface, as shown in Figure GM1-F-2. The stroke of the arrow(s) should be 50 cm in width and at least 3 m in length. When combined with a flight path alignment guidance lighting system, it should take the form shown in Figure GM1-F-2, which includes the

scheme for marking the 'heads of the arrows', which are always of the same size, regardless of the stroke length.

(2) In the case of a flight path limited to a single approach direction or a single departure direction, the arrow marking may be unidirectional. In the case of a heliport with only a single approach/departure path available, one bidirectional arrow is marked.

(3) The markings should be in a colour, preferably white, which provides good contrast against the background colour of the surface on which they are marked.

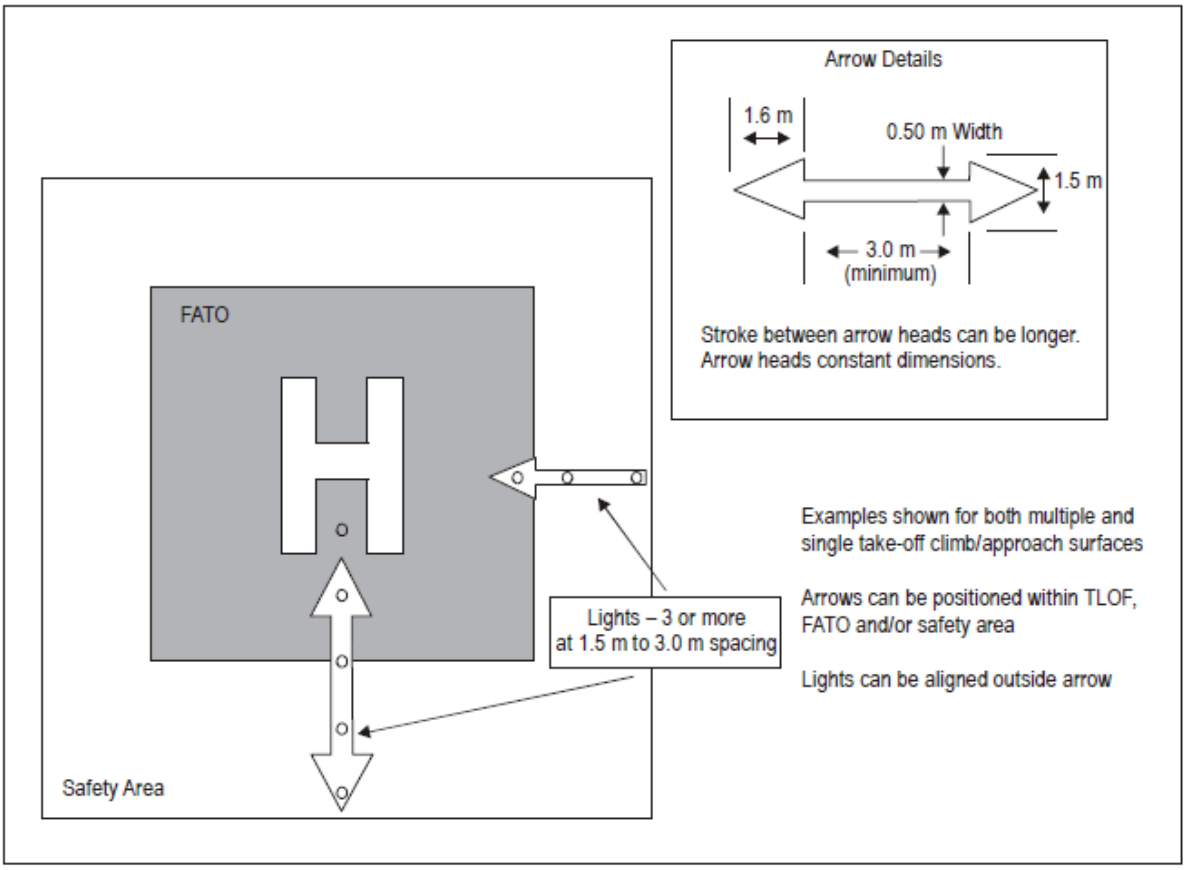


Figure GM1-F-2. Flight path alignment guidance markings and lights

GM1 HPT-DSN.F.630 Approach lighting system

(a) Location: The approach lighting system should be located in a straight line along the preferred direction of approach.

(b) Characteristics:

(1) An approach lighting system should consist of a row of three lights spaced uniformly at 30 m intervals and of a crossbar 18 m in length at a distance of 90 m from the perimeter of the FATO. The lights forming the crossbar should be as nearly as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centre line lights, and spaced at 4.5 m intervals (see Figure GM1-F-3).

(2) Where there is a need to make the final approach course more conspicuous, additional lights spaced uniformly at 30 m intervals should be added beyond the crossbar. The lights beyond the crossbar may be steady or sequenced flashing, depending upon the environment.

(3) The steady lights should be omnidirectional white lights.

(4) Sequenced flashing lights should be omnidirectional white lights.

(5) The flashing lights should have a flash frequency of one per second and their light distribution should be as shown in Figure F-6, Illustration 2. The flash sequence should commence from the outermost light and progress towards the crossbar.

(6) A suitable brilliancy control should be incorporated to allow for adjustment of light intensity to meet the prevailing conditions.

(7) Additional guidance on light intensity controls is given in GM1 ADR-DSN.M.615.

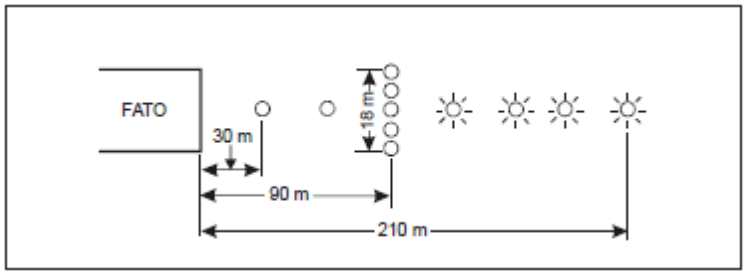


Figure GM1-F-3. Approach lighting system

GM1 HPT-DSN.F.640 Flight path alignment guidance lighting system

(a) General: The flight path alignment guidance lighting can be combined with a flight path alignment guidance marking(s).

(b) Location:

(1) The flight path alignment guidance lighting system should be in a straight line along the direction(s) of approach and/or departure path on one or more of the TLOF, FATO, safety area or any suitable surface in the immediate vicinity of the FATO, TLOF or safety area.

(2) If combined with a flight path alignment guidance marking, then as far as is practicable, the lights should be located inside the 'arrow' markings.

(c) Characteristics:

(1) A flight path alignment guidance lighting system should consist of a row of three or more lights spaced uniformly over a total minimum distance of 6 m. Intervals between lights should not be less than 1.5 m and should not exceed 3 m.

(2) Where space permits, there should be 5 lights. The number of lights and the spacing between these lights may be adjusted to reflect the space available.

(3) If more than one flight path alignment system is used to indicate the available approach and/or departure path direction(s), the characteristics for each system are typically kept the same (see Figure GM1-F-2).

(4) The lights should be steady omnidirectional inset white lights.

(5) The distribution of the lights should be as indicated in Figure F-6, Illustration 5.

(6) A suitable control should be incorporated to allow for adjustment of light intensity to meet the prevailing conditions and to balance the flight path alignment guidance lighting system with other heliport lights and general lighting that may be present around the heliport.

GM1 HPT-DSN.F.650 Visual alignment guidance system

(a) Location:

(1) The visual alignment guidance system should be located such that a helicopter is guided along the prescribed track towards the FATO.

(2) The system should be located at the downwind edge of the FATO and aligned along the preferred approach direction.

(3) The light units should be frangible and mounted as low as possible.

(4) Where the lights of the system need to be seen as discrete sources, light units should be located such that at the extremes of system coverage, the angle subtended between the units as seen by the pilot should not be less than 3 minutes of arc.

(5) The angles subtended between the light units of the system and other units of comparable or greater intensities should also be not less than 3 minutes of arc.

(6) The requirements of paragraphs (4) and (5) above can be met for lights on a line normal to the line of sight if the light units are separated by 1 m for every kilometre of viewing range.

(b) Signal format:

(1) The signal format of the alignment guidance system should include a minimum of three discrete signal sectors providing ‘offset to the right’, ‘on track’ and ‘offset to the left’ signals.

(2) The divergence of the ‘on track’ sector of the system should be 1° (see Figure GM1-F-4.)

(3) The signal format should be such that there is no possibility of confusion between the system and any associated visual approach slope indicator or other visual aids.

(4) The system should avoid the use of the same coding as any associated visual approach slope indicator.

(5) The signal format should be such that the system is unique and conspicuous in all operational environments.

(6) The system should not significantly increase the pilot workload.

(c) Light distribution:

(1) The usable coverage of the visual alignment guidance system should be equal to or better than that of the visual approach slope indicator system with which it is associated.

(2) A suitable intensity control should be provided so as to allow adjustment to meet the prevailing conditions and to avoid dazzling the pilot during approach and landing.

(d) Approach track and azimuth setting:

(1) A visual alignment guidance system should be capable of adjustment in azimuth to within ± 5 minutes of arc of the desired approach path.

(2) The angle of the azimuth guidance system should be such that during an approach, the pilot of a helicopter at the boundary of the 'on track' signal would clear all objects in the approach area by a safe margin.

(3) The characteristics of the obstacle protection surface specified in Table F-1 and Figure F-7 should equally apply to the system.

(e) Characteristics of the visual alignment guidance system:

(1) In the event of a failure of any component affecting the signal format, the system should be automatically switched off.

(2) The light units should be so designed that deposits of condensation, ice, dirt, etc., on optically transmitting or reflecting surfaces would interfere to the least possible extent with the light signal and should not cause spurious or false signals to be generated.

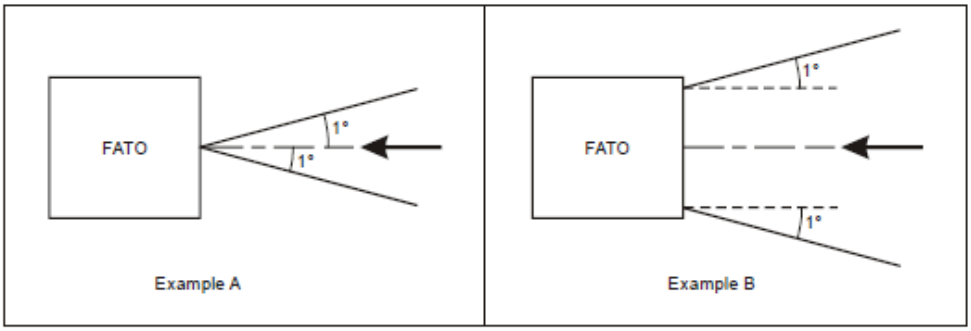


Figure GM1-F-4. Divergence of the 'on track' sector

GM1 HPT-DSN.F.660 Heliport visual approach slope indicator

(a) When more than one visual approach slope indicator are installed at an aerodrome, the systems should be designed and calibrated in order to give a clear and unambiguous indication to pilots approaching to land.

(b) A heliport visual approach slope indicator should be provided to serve the approach to a heliport, where the characteristics of the helicopter require a stabilised approach.

(c) A heliport visual approach slope indicator should be located adjacent to the nominal aiming point and aligned in azimuth with the preferred approach direction.

(d) When a short range approach (typical of helicopters) is flown, besides the standard visual approach path indicators (HAPI/APAPI/PAPI), tri-colour visual glideslope indicators such as GPI (glide path indicator)

should be considered acceptable. Tri−colour visual approach slope indicators normally consist of a single light unit, projecting a three−colour visual approach path into the FATO area upon which the indicator is installed. The below glide path indication is red, the above glide path indication is amber and the on glide path indication is green. These types of indicators have a useful range of approximately 1/2 to 1 mile during the day and up to 5 miles at night, depending upon the visibility conditions.

(e) Care is required in the design of the unit to minimize spurious signals between the signal sectors, and at the azimuth coverage limits.

(f) Larger azimuth coverage can be obtained by installing the HAPI system on a turntable.

GM1 HPT-DSN.F.690 Touchdown and lift-off area lighting system

TLOF ASPSL and/or LPs to identify the touchdown marking and/or floodlighting should be provided for use at night when enhanced surface texture cues are required.

GM1 HPT-DSN.F.710 Visual aids for denoting obstacles

(a) General: If it is not possible to display obstacle lights on obstacles at a heliport intended for use at night, the obstacles should be floodlit.

(b) Location: Obstacle floodlights should be arranged so as to illuminate the entire obstacle and, as far as practicable, in a manner so as not to dazzle helicopter pilots.

(c) Characteristics: Obstacle floodlighting should produce a luminance of at least 10 cd/m^2.

4. Impact assessment (IA)

4.1. What is the issue

The proposed changes in this NPA are based on the relevant ICAO Annex 14 SARPs, Aerodromes, Volume II, Heliports.

In order to assess the situation of the proposed rules in RMT.0638, certification requirements for VFR heliports located at aerodromes that fall under the scope of the Basic Regulation[6], EASA sent a survey to the EASA Member States (MSs) and to states with which EASA has signed working arrangements in the field of aerodromes (observers).

A survey was sent to assess the current situation and the potential impacts of the regulatory proposal.

The questions in the survey were focused on collecting data regarding:

(a) the number of VFR heliports located at aerodromes in the scope;

(b) the number of VFR heliports located at aerodromes expected to be exempted under Article 4 of the Basic Regulation;

(c) the number of VFR heliports located at aerodromes certified under national rules;

(d) the number of FTEs (full time equivalents) engaged in heliport certification/oversight;

(e) any identified specific safety risks.

The survey was sent to National Aviation Authorities (NAAs) on 7/2/2017 and closed on 17/2/2017.

In total, EASA received 33 replies, of which 27 were from EASA Member States and 6 from observers.

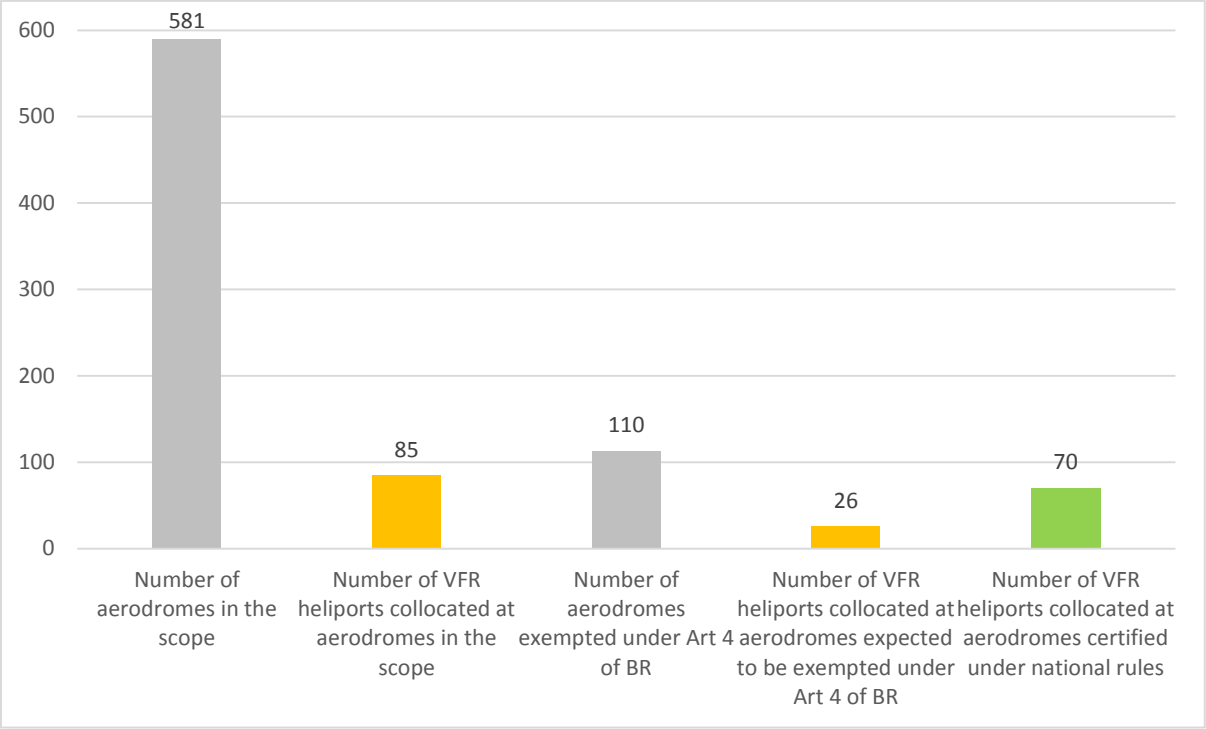
(a) Number of VFR heliports located at aerodromes in the scope of the Basic Regulation

The data collected from the survey indicated that 85 VFR heliports were located at aerodromes that are in the scope[7], out of which 26 VFR heliports are located at aerodromes exempted/expected to be exempted under Article 4(3b) of the Basic Regulation.

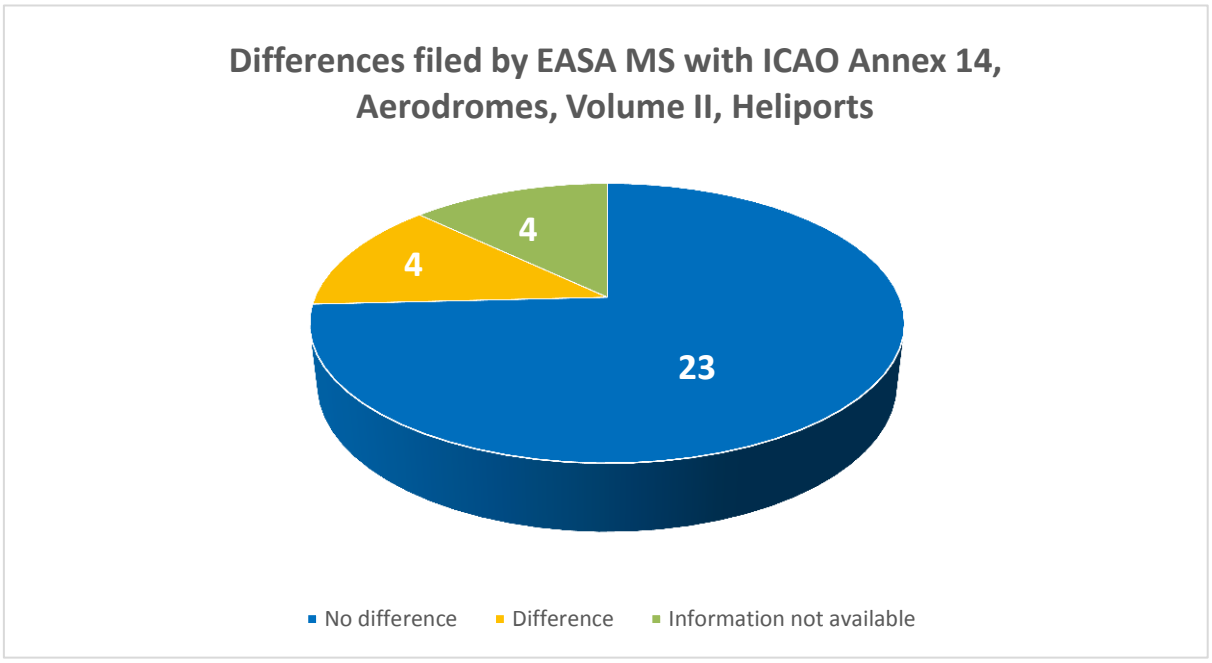
In comparison to the CS-ADR-DSN requirements for aerodrome design, it is estimated that the proposed CS-HPT-DSN requirements would be applicable to a reasonably small number of approximately 59 VFR heliports located at aerodromes that fall under the scope of the Basic Regulation.

[6] REGULATION (EC) No 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC

[7] According to EASA's data based on the information received from the EASA Member States in accordance with Article 4 and 5 of Regulation (EU) No 139/2014 there are 581 aerodromes that fall under the scope of the Basic Regulation out of which 110 are exempted under Article 4 of Regulation (EC) 216/2008.



Independently from the survey, EASA has reviewed the differences filed by the MSs against the provisions of ICAO Annex 14, Volume II, Heliports, and in particular to surface level heliports. The data indicates that 23 MSs have filed no differences, while in only 4 MSs, the national regulations for heliports contain differences with respect to the provisions of ICAO Annex 14, Volume II, Heliports (e.g. some recommendations are upgraded to standards, there is a lower implementation of provisions for some topics, etc.).



(b) FTE engaged in heliport certification/ oversight

The data collected shows that, in most cases, FTEs are not exclusively engaged in heliport certification/oversight, rather they are involved in all aerodrome design, certification and operational issues.

(c) Specific risks

In general, no specific safety risks were identified. Where specific risks were nevertheless identified, they were mostly linked to the control of obstacles and to hot refuelling.

4.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2.

The specific objective of this NPA is to propose requirements in the field of surface-level VFR heliports that ensure:

— a smooth transition from national-based to European regulation, maintain the existing level of safety, and that are harmonised with the relevant ICAO Annex 14, Aerodromes, Volume II, Heliports; and

— cost-efficiency and a level playing field.

4.3. How it could be achieved — options

Table 1: Selected policy options

Option No	***Short title***	**Description**
0		'No policy change' is only theoretically an option in this NPA, as the task is mandated by the Basic Regulation, which states the need to provide suitable requirements.
1		VFR Heliports with European certification rules.

4.4. What are the impacts

4.4.1. Safety impact

Not relevant, as explained in 4.3.

4.4.2. Environmental impact

Not applicable.

4.4.3. Social impact

Not applicable.

4.4.4. Economic impact

Option 0

No economic impact.

Option 1:

— is expected to have a positive impact on the cost-efficiency of the certification process. The proposed requirements will allow operators of aerodromes that fall under the scope of the Basic Regulation to benefit from the opportunity of having one certification basis for the aerodrome and any collocated heliport;

— will not create additional burden for the NAAs and aerodrome operators:

- it is expected to have a smooth conversion process from national rules based on ICAO Annex 14 SARPs to the proposed CS-HPT-DSN requirements, as only minor differences from the ICAO SARPs have been filed by the Member States;
- the personnel responsible for the certification/oversight of aerodrome design and operations are already engaged in heliport certification/oversight activities under their national regulations.

4.4.5. General Aviation and proportionality issues

Not applicable.

4.5. Conclusion

Option 0 'No policy change' does not support efficiency and does not provide a level playing field.

Option 1

Knowing that:

— the proposed CS-HPT-DSN requirements will ensure a common European regulatory framework for VFR heliports located at aerodromes that fall under the scope of the Basic Regulation, as well as harmonisation with the relevant standards and recommended practices (SARPs) for VFR surface level heliports from ICAO Annex 14, Aerodromes, Volume II, Heliports, while maintaining the same level of safety;

— the certification processes for both aerodromes and heliport design will be performed according to the provisions of Regulation (EU) No 139/2014;

The following impact is envisaged for Option 1:

— A positive impact on the cost-efficiency of the certification process. The proposed requirements will allow operators of aerodromes that fall under the scope of the Basic Regulation to benefit from the opportunity to have one certification basis, which includes any collocated heliport;

— no additional burden will be created for the NAAs and aerodrome operators:

- it is expected that there will be a smooth conversion process from national rules based on ICAO Annex 14 SARPs to the proposed CS-HPT-DSN requirements, as only minor differences from the ICAO SARPs have been filed by the Member States;

- the personnel responsible for the certification/oversight of aerodrome design and operations are already engaged in heliport certification/oversight activities under their national regulations.

Invitation to stakeholders

Additionally, stakeholders are kindly invited to provide data on potential costs or savings incurred by these draft rules, as well as any other quantitative information that they may find necessary to bring to the attention of EASA. An updated RIA may be provided with the ED Decision when relevant.

Therefore, Option 1 is the preferred option.

5. Proposed actions to support implementation

The means for facilitating the implementation of the certification specifications for heliport design, CS/GM are:

— communication with advisory bodies (Technical Bodies (TeBs) and Stakholder Technical Bodies (STeBs) or workshops,

— providing supporting clarifications via electronic communication tools.

6. References

6.1. Reference documents

ICAO Annex 14, Aerodromes, Volume I, Aerodrome Design and Operations, Seventh Edition, July 2016.

ICAO Annex 14, Aerodromes, Volume II, Heliports, Fourth Edition, July 2013.

7. Appendix

Not applicable.