Notice of Proposed Amendment (NPA)

Regulation- Proposed Changes

CAR-139 Part II

Heliports/Water Aerodrome

Directorate General of Civil Aviation Regulations

Aviation Safety Regulations Department

Date of Issue: 9/30/2025

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Ref: NPA-CRD No: 15 -2025 to RMT.2025-15 to CAR-139 PART II

Date of Issue: 9/30/2025

1. EXPLANATORY NOTE

1.1. General

The Civil Aviation Authority (CAA) has developed this Notice of Proposed Amendment (NPA) to highlight the new revision of CAR-139 PART II. This revision establishes updated measures for the implementation of standards and requirements for **Heliports** as stipulated in ICAO Annex 14 Vol II (Amendment 10).

In line with these updates, the regulation has been fully restructured to ensure alignment with ICAO provisions and supporting guidance.

- **Entry to Force Date: 30-Oct-25**
- **Applicability Date:**
  - Obstacle limitation surfaces and visual aids (lighting) associated with heliports: **27-Nov-25**
  - Certification and a safety management system (SMS) at heliports: **1-Jun-26**

1.2. Reason for Change

There are a number of factors that have determined the need for and timing of this amendment:

- ☒ Any amendment to an Annex of the Chicago Convention or Documents and Manuals based thereon (ICAO SARPs).
- ☐ Any amendment to foreign source regulation, which has been adapted into an Omani Civil Aviation Regulation.
- ☐ Evidence indicating that current requirements may be inadequate to appropriately address an identified safety risk, such as:
  - ☐Outcomes of a safety risk management for new Hazards,
  - ☐ Current safety risk controls are not adequately effective,
  - ☐Elimination of safety risks for which the Regulation was designed;
- ☐ Petitions from any interested party or requests from industry stakeholders.
- ☐ Any other reason to be specified by the Directorate General of Civil Aviation Regulation.
  - ☐New technology or scientific data;
  - ☐Required reviews;
  - ☐Statutory mandates;
  - ☐Lawsuits

☐Recommendations from other external agencies/government bodies;
☐Other operational and environmental demands;
☐When it is no longer relevant, applicable or effective

1.3. Description of Changes

- **Key Changes in Edition 05:**
  - **Certification and an SMS at heliports**: establishes the need to certify heliports used for international operations in accordance with the applicability of the Annex. In addition, the lack of regulatory requirement for certification and SMS of public use heliports has resulted in a reduced protection of heliport passengers when compared to aerodrome passengers, and it is deemed beneficial for safety, regularity and efficiency to certify and require SMS also for these heliports. The proposal to introduce heliport certification and SMS with continuous oversight in Annex 14, Volume II will assist to reduce helicopter accidents and incidents at heliports.
  - **Obstacle limitation surfaces**: it has been observed that many heliports no longer have runway-type final approach and take-off areas (FATOs) and are not situated in large open areas; most are on small sites, located such that the versatility of the helicopter permits operations that would normally be inaccessible to fixed wing aircraft. The location of new heliports in congested areas has also necessitated the elevation of the facilities to the top of buildings to raise them above the obstacle environment. The objectives of existing Standards in Annex 14, Volume II have not been changed; mostly they have been modified or extended to allow for the flexibility required for the introduction of heliports in obstacle rich environments.
  - **Visual aids (lighting)**: the amendment is now more objective with some prescriptive text being converted to guidance, expanded and transferred to the *Heliport Manual* (Doc 9261). This has resulted in the detailed specifications of certain not commonly used lighting systems being migrated into Doc 9261 to allow operators some flexibility and discretion.
- **Enhancing various administrative and technical aspects.**

2. Notice of Proposed Amendment (NPA) – Public Consultation

In order to ensure broad engagement and gather relevant feedback, this **Notice of Proposed Amendment (NPA)** is hereby issued for consultation to Oman Airports Management Company, and Occidental Mukhaizna LLC.

- A **Comment Form** is included with the consultation details and must be completed and submitted to:
  - **Mail:** Safety Regulation Department (SRD)
  - **Attn:** Acting Director General for Civil Aviation Regulation
  - **Email:** ✉ Safety.Regulations@caa.gov.om

- **Consultation Timeline:**
  - **Consultation Period:** 14 calendar days
  - **Effective Start Date:** 09/30/2025
  - **Closing Date for Comments:** 10/14/2025
- ***Important:***
  - Comments must be submitted **using the prescribed Comment Form**.
  - Submissions received **after the closing date** or **not in the prescribed format** may not be considered.

3. Comment Response Document (CRD)

- All comments received during the consultation period will be formally reviewed by RWG and relevant Department.
- Responses to all comments will be compiled in a **Comment Response Document (CRD)**.
- The **CRD** will detail:
  - The comments received,
  - CAA responses and justifications,
  - Any revisions made to the proposed regulation text as a result of stakeholder input.
- The CRD may also include a list of all persons and/or organisations that provided comments, in line with transparency and consultation best practices.

Rawya Nasser Hamed Al-Adawi

Aviation Safety Regulations Department Director

- Attached Notice of Proposed Amendment
- Attached Comment Response Document

Attached Notice of Proposed Amendment

CAR-139 PART II
Heliports/Water Aerodrome

- *CAR-139 PART II **Heliports/Water Aerodrome** (Draft) attached:*

Notes on the presentation of the amendment to CAR-139 PART II.

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

~~**Text to be deleted is shown with a line through it.**~~	**text to be deleted**
New text to be inserted is highlighted in grey shading.	**new text to be inserted**
~~**Text to be deleted is shown with a line through it**~~ **followed by the replacement text which is highlighted in grey shading.**	**new text to replace existing text**

Note: *This presentation method may not be applied where amendments exceed **40% revision of the regulation**, in which case a fully reissued consolidated draft regulation is provided.*

TEXT OF AMENDMENT

TO THE CAR-139 PART II

Heliports/Water Aerodrome

ABBREVIATIONS AND SYMBOLS

Abbreviations

AIP	Aeronautical Information Publication
IDF	Initial departure fix
OCS	Obstacle clearance surface
PRP	Point-in-space reference point
RFF	Rescue and Firefighting
RFM	Rotorcraft flight manual (also known as HFM)

CHAPTER 1 –GENERAL

~~Introductory~~ Note 1: *CAR 139, Part II, contains provisions that prescribe the physical characteristics and obstacle limitation surfaces to be provided for at heliports, and certain facilities and technical services normally provided at a heliport. It is not intended that these specifications limit or regulate the operation of an aircraft.*

Note 2: *When designing a heliport, a ~~the critical~~ design helicopter, ~~having~~ which represents the largest ~~set of~~ dimensions ~~and~~; the greatest maximum take-off mass (MTOM) ;and the most critical obstacle avoidance criteria of the population of helicopters the heliport is intended to serve, ~~would need to be considered~~ is taken into account. For guidance on establishing a design helicopter see the Heliport Manual (Doc 9261).*

It is to be noted that provisions for helicopter flight operations are contained in Annex 6, Part III.

Note 3: *CAR139 Part II further prescribes the design criteria and operational specifications applicable to water aerodromes, addressing requirements that are specific to such facilities.*

1.1 Definitions

Ascent/Descent surface. An inclined plane or complex surface that slopes upward from the centre of the FATO to indicate the path helicopters are expected to follow when vertical procedures are utilized – it can consist of:

a) an inverted triangle when there is no lateral component; or
b) an inverted conical surface when there is a lateral component.

Declared distances — heliports.

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

Elevated helicopter clearway. A helicopter clearway that has been raised to a level that provides obstacle clearance.

Helicopter clearway. 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~~ specified set of helicopter flight conditions.

Initial departure fix (IDF). The terminal fix for the visual segment and the fix where the instrument phase of the PinS departure begins.

Point-in-space (PinS) approach. ~~The Point in space approach is based on GNSS and is~~ an approach procedure designed for helicopters only that includes both a visual and an instrument segment. ~~It is aligned with a reference point located to permit subsequent flight manoeuvring or approach and landing using visual manoeuvring in adequate visual conditions to see and avoid obstacles.~~

Point-in-space (PinS) departure. A departure procedure designed for helicopters only that includes both a visual and an instrument segment.

Point-in-space (PinS) reference point (PRP). Reference point for the point-in-space approach as identified by the latitude and longitude of the MAPt.

Point-in-space (PinS) visual segment. ~~This is~~ T~~t~~he segment of a helicopter PinS ~~approach~~ procedure ~~from the~~ between a point (MAPt or IDF) and the heliport ~~to the landing location~~

~~for a PinS "proceed visually" procedure. This visual segment connects the Point in space (PinS) to the landing location.~~

Note: *The ~~procedure~~ design criteria for ~~a PinS approach and the detailed design requirements for a visual segment~~ procedures are established in the Procedures for Air Navigation Services — Aircraft Operations, Volume II (PANS-OPS, Doc 8168 – Volume II).*

Vertical procedures. Take-off and landing procedures that include an initial vertical or steep climb and a final vertical or steep descent profile. The profile may or may not include a lateral component.

1.4 Certification of heliports *(Applicable as of 26 November 2026)*

Note: *The intent of these specifications is to ensure the establishment of a regulatory regime so that compliance with the specifications in this CAR can be effectively enforced. It is recognized that the methods of ownership, operation and surveillance of heliports differ among States. The most effective and transparent means of ensuring compliance with applicable specifications is the availability of a separate safety oversight entity and a well-defined safety oversight mechanism with support of appropriate legislation to be able to carry out the function of safety regulation of heliports. When a heliport is granted a certificate, it signifies to aircraft operators and other organizations operating on the heliport that, at the time of certification, the heliport meets the specifications regarding the facility and its operation, and that it has, according to the certifying authority, the capability to maintain these specifications for the period of validity of the certificate. The certification process also establishes the baseline for continued monitoring of compliance with the specifications. Information on the status of certification of heliports would need to be provided to the appropriate aeronautical information services for promulgation in the Aeronautical Information Publication (AIP). See 2.6.1 and the PANS-AIM (Doc 10066), Appendix 2, AD 1.5 (1).*

1.4.1 Heliports used for international operations shall be certified in accordance with the specifications contained in this CAR as well as other relevant CAA specifications through an appropriate regulatory framework.

1.4.2 For the safety, regularity and efficiency of operations, heliports that are open to public shall be certified in accordance with the specifications contained in this CAR as well as other relevant CAA specifications through an appropriate regulatory framework.

1.4.3 The regulatory framework shall include the establishment of criteria and procedures for the certification of heliports.

1.4.4 As part of the certification process, CAA must be satisfied that a heliport manual which will include all pertinent information on the heliport site, facilities, services, equipment, operating procedures, organization and management including a safety management system (SMS), is submitted by the applicant for approval prior to granting the heliport certificate.

Note. — *CAR 100 — Safety Management System contains SMS provisions applicable to certified heliports. Overarching guidance on SMS is contained in the Safety Management Manual (Doc 9859) with sector-specific guidance found in the Heliport Manual (Doc 9261).*

CHAPTER 2 – HELIPORT DATA

2.4 Heliport dimensions and related information

2.4.1 The following data shall be measured or described, as appropriate, for each facility provided on a heliport:

g) approach surface — when elevated, the height of the inner edge above the FATO;

Note: *When the take-off climb surface is elevated, its inner edge and height will be the outer edge of the elevated helicopter clearway as specified in 4.1.14.*

~~g~~h) Helicopter Clearway — length, ground profile, or, when elevated, height above the FATO, length and width; and

~~h~~i) visual aids for approach procedures, marking and lighting of FATO, TLOF, helicopter taxiways, helicopter taxi-routes and helicopter stands.

2.6 Coordination between aeronautical information services and heliport authorities

2.6.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and heliport authorities responsible for heliport services to report to the responsible aeronautical information services unit, with a minimum of delay:

a) information on the status of certification of heliports and information on heliport conditions;

CHAPTER 3. PHYSICAL CHARACTERISTICS

Helicopter clearways

Note: *The inclusion of detailed specifications for helicopter clearways in this section is not intended to imply that a clearway has to be provided.*

3.1.16 A helicopter clearway shall provide:

a) an area free of obstacles, except for essential objects which because of their function are located on it, and of sufficient size and shape to ensure containment of the design helicopter when it is accelerating in level flight, and close to the surface, to achieve its safe climbing speed; and

b) when solid, a surface which: is contiguous and flush with the FATO and safety area, is resistant to the effects of rotor downwash; and is free of hazards if a forced landing is required; or

c) when elevated, clearance above all obstacles.

3.1.17 When a helicopter clearway is provided, ~~it~~ the inner edge shall be located ~~beyond the end of the FATO.~~

a) at the outer edge of the safety area; or

b) when elevated, directly above, or directly below, the outer edge of the safety area.

Note: *Guidance on designing a clearway that is below the FATO of an elevated heliport/helideck is provided in Heliport Manual (Doc 9261).*

3.2 Helidecks

3.2.1 The specifications in paragraphs 3.~~3~~ 2.14 and 3.~~3~~ 2.15 shall be applicable for helidecks.

3.2.2 A helideck shall be provided with one FATO and one coincident or collocated TLOF.

3.2.3 A FATO may be any shape but shall be of sufficient size to contain an area within which can be accommodated a circle of diameter of not less than 1 D of the largest helicopter the helideck is intended to serve.

3.2.4 A TLOF may be any shape but, subject to an appropriate risk assessment, shall be of sufficient size to contain:

~~a) for helicopters with an MTOM of more than 3 175 kg, an area within which can be accommodated a circle of diameter not less than 1 D of the largest helicopter the helideck is intended to serve; and~~

b) ~~for helicopters with an MTOM of 3 175 kg or less,~~ an area within which can be accommodated a circle of diameter not less than 0.83 D of the largest helicopter the helideck is intended to serve.

Note: *Further guidance on factors to inform the risk assessment are given in the* Heliport Manual *(Doc 9261).*

3.2.5 ~~For helicopters with a MTOM of 3 175 kg or less,~~ T~~t~~he TLOF shall be of sufficient size to contain an area within which can be accommodated a circle of diameter of not less than 1 D of the largest helicopter the helideck is intended to serve.

3.2.10 No fixed object shall be permitted around the edge of the TLOF except for ~~frangible~~ objects, which, because of their function, must be located thereon.

3.3 Shipboard heliports

3.3.12 No fixed object shall be permitted around the edge of the TLOF except for ~~frangible~~ objects, which, because of their function, must be located thereon.

CHAPTER 4 – OBSTACLE ENVIRONMENT

4.1 Obstacle limitation surfaces and sectors

Note 1: *A full description, detailed explanation and visual depiction of the obstacle limitation surfaces and sectors is provided in the Heliport Manual (Doc 9261).*

Note 2: *For guidance on the provision of vertical procedures, see the Heliport Manual (Doc 9261).*

Note 3: *For guidance on the provision of elevated helicopter clearways and elevated surfaces, see the Heliport Manual (Doc 9261).*

Note 4: *See Table 4-1 for dimensions and slopes of surfaces.*

Approach surface

4.1.1 Description. An inclined plane or a combination of planes or, when a turn ~~is~~ or turns are involved, a complex surface sloping upwards from the inner edge ~~the end of the safety area~~ and centred on a line passing through the centre of the FATO.

~~***Note:*** *See Figures 4-1, 4-2, 4-3 and 4-4 for depiction of surfaces. See Table 4-1 for dimensions and slopes of surfaces.*~~

4.1.2 Characteristics. The limits of an approach surface shall comprise:

a) an inner edge horizontal and perpendicular to the centre line of the approach surface, with a minimum width 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:

1) the outer edge of the safety area; or

2) when vertical procedures are being utilized, directly above the outer edge of the safety area.

b) 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:

c) an outer edge horizontal and perpendicular to the centre line of the approach surface ~~and~~ at

1) a ~~specified~~ height of 152 m (500 ft) above the elevation of the FATO; or

2) when a PinS approach procedure with proceed visually instruction is defined, a specified height above the elevation of the FATO.

4.1.3 The elevation of the inner edge shall be:

a) The elevation of the FATO at the point on the inner edge that is intersected by the centre line of the approach surface; or ~~For heliports intended to be used by helicopters operated in performance class 1 and when approved by an appropriate authority, the origin of the inclined plane may be raised directly above the FATO.~~

b) when vertical procedures are being utilized; the level at which obstacle clearance is achieved.

4.1.5 In the case of an approach surface involving a turn or turns, the surface shall be a complex surface containing the horizontal normals to its centre line and the slope of the centre line shall be the same as that for a straight approach surface.

Note: *See Figure 4-~~5~~ 1. For guidance on construction of turns in approach or take-off climb surfaces see the* Heliport Manual *(Doc 9261).*

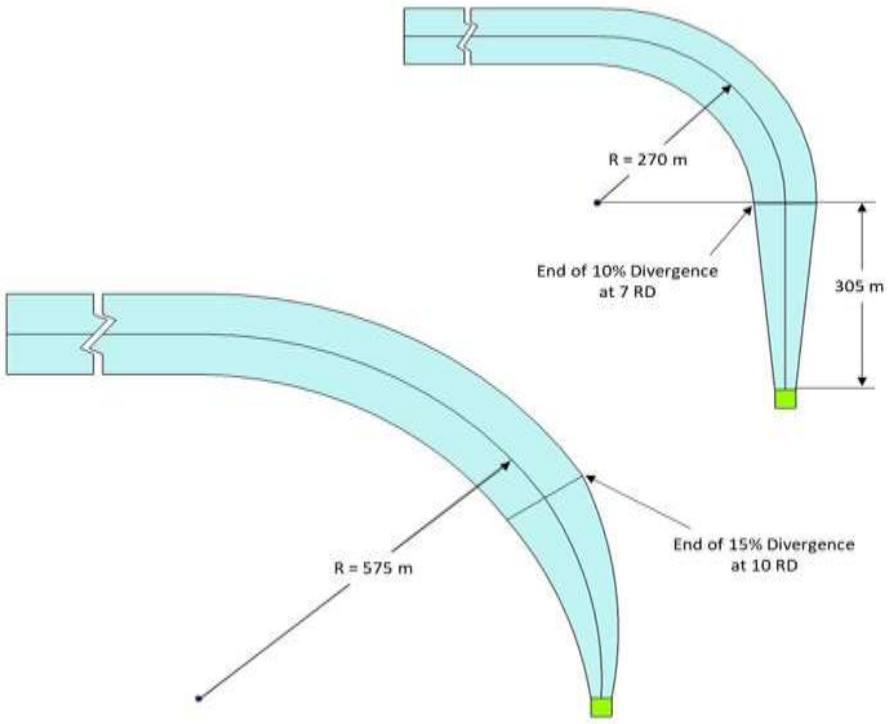


Figure 4-~~5~~.1. Curved approach and take-off climb surface for all FATOs

~~4.1.6~~ ~~In the case of an approach surface involving a turn, the surface shall not contain more than one curved portion.~~

4.1.6~~7~~ 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 shall not be less than 575 m.

4.1.7~~8~~ Any variation in the direction of the centre line of an approach surface shall be designed so as not to necessitate a turn radius less than 270 m.

Transitional surface

~~***Note:*** *For a FATO at a heliport without a PinS approach incorporating a visual segment surface (VSS) there is no requirement to provide transitional surfaces.*~~

4.1.8 Description. A complex surface along the side of the safety area and helicopter clearway, when provided, and part of the side of the approach/or take-off climb surface, that slopes upwards and outwards to a predetermined height ~~of 45 m (150 ft).~~

~~***Note:*** *See Figure 4-3. See Table 4-1 for dimensions and slopes of surfaces.*~~

4.1.9 Characteristics. The limits of a transitional surface shall comprise:

a) a lower edge beginning at a point on the side of the approach/or take-off climb surface at a specified height ~~above the lower edge~~ extending down the side of the approach/or take-off climb surface to the inner edge ~~of the approach/take off climb surface~~ and from there along the length of the side of the helicopter clearway, when provided, and safety area, parallel to the centre line of the FATO; and

b) an upper edge located at a ~~specified height above the lower edge as set out in Table 4-1.~~

1) 45 m (150 ft) above the FATO; or

2) when vertical procedures are being utilized; 15 m (50 ft) above the elevation of the upper edge of the ascent/descent surface.

4.1.10 The elevation of a point on the lower edge shall be:

a) along the side of the approach/or take-off climb surface — equal to the elevation of the approach/or take-off climb surface at that point; ~~and~~ then

b) if provided, along the helicopter clearway – equal to the elevation of the helicopter clearway; and

c) along the safety area — equal to the ~~elevation of the inner edge of the approach/take-off climb surface~~ FATO.

~~***Note 1:*** *If the origin of the inclined plane of the approach/take-off climb surface is raised as approved by an appropriate authority, the elevation of the origin of the transitional surface will be raised accordingly.*~~

~~***Note 2:*** *As a result of b) the transitional surface along the safety area will be curved if the profile of the FATO is curved, or a plane if the profile is a straight line.*~~

4.1.11~~2~~ The slope of the transitional surface shall be measured in a vertical plane at right angles to the centre line of the FATO.

Take-off climb surface

4.1.12 Description. An inclined plane, a combination of planes or, when a turn or turns ~~is~~ are involved, a complex surface sloping upwards from the end of the safety area, or of the helicopter clearway, when provided, and centred on a line passing through the centre of the FATO.

~~***Note:*** *See Figures 4-1, 4-2, 4-3 and 4-4 for depiction of surfaces. See Table 4-1 for dimensions and slopes of surfaces.*~~

4.1.13 Characteristics. The limits of a take-off climb surface shall comprise:

a) an inner edge, horizontal and perpendicular to the centre line of the take-off climb surface, with a ~~equal in length to the~~ minimum ~~specified~~ width of the 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;~~

1) when located at the outer edge of the safety area or helicopter clearway, the FATO plus the safety area; or
2) when located at the outer edge of the elevated helicopter clearway, the elevated helicopter clearway.

b) 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

c) 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.~~

1) a ~~specified~~ height of 152 m (500 ft) above the elevation of the FATO; or
2) when a PinS departure procedure with proceed visually instruction is defined, a specified height above the elevation of the FATO.

4.1.14 The elevation of the inner edge shall be:

a) 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; or ~~For heliports intended to be used by helicopters operated in performance class 1 and when approved by an appropriate authority, the origin of the inclined plane may be raised directly above the FATO.~~

b) when located at the outer edge of the helicopter clearway, the elevation of the helicopter clearway.

~~4.1.16Where a clearway is provided the elevation of the inner edge of the take-off climb surface shall be located at the outer edge of the clearway at the highest point on the ground based on the centre line of the clearway.~~

4.1.15 In the case of a straight take-off climb surface, the slope shall be measured in the vertical plane containing the centre line of the surface.

4.1.16 In the case of a take-off climb surface involving a turn or turns, the surface shall be a complex surface containing the horizontal normals to its centre line and the slope of the centre line shall be the same as that for a straight take-off climb surface.

Note: *See Figure 4-~~5~~ 1. For guidance on construction of turns in approach or take-off climb surfaces see the Heliport Manual (Doc 9261).*

~~**4.1.17** In the case of a take-off climb surface involving a turn, the surface shall not contain more than one curved portion.~~

4.1.17 Where a curved portion of a take-off climb surface, that does not have its inner edge at the outer edge of a clearway, 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 shall not be less than 575 m.

Note: Helicopter take-off performance is reduced in a turn and as such a straight portion along the take-off climb surface prior to the start of the curve allows for acceleration.

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

~~***Note 1:*** *Helicopter take-off performance is reduced in a curve and as such a straight portion along the take-off climb surface prior to the start of the curve allows for acceleration.*~~

Note ~~2~~: *For heliports intended to be used by helicopters operated in performance class 2 and 3 it is good practice for the departure paths to be selected so as to permit safe forced landings or one-engine-inoperative landings such that, as a minimum requirement, injury to persons on the ground or water 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.*

Obstacle-free sector/surface — helidecks

4.1.19~~22~~ Description. A complex surface originating at and extending from a reference point on the edge of the FATO of a helideck. In the case of a TLOF of less than 1 D, the reference point shall be located not less than 0.5 D from the centre of the TLOF.

4.1.20~~23~~ Characteristics. An obstacle-free sector/surface shall subtend an arc of specified angle.

4.1.21~~24~~ A helideck obstacle-free sector shall comprise of two components, one above and one below helideck level:

Note: *See Figure 4-~~7~~ 2.*

4.1.22~~5~~ Description. A complex surface originating at the reference point for the obstacle-free sector and extending over the arc not covered by the obstacle-free sector within which the height of obstacles above the level of the TLOF will be prescribed.

Limited obstacle sector/surface — helidecks

4.1.23 Characteristics. A limited obstacle sector shall not subtend an arc greater than 150 degrees. Its dimensions and location shall be as indicated in Figure 4-~~8~~ 3 for a 1 D FATO with coincidental TLOF and Figure 4- 4 ~~9~~ for a 0.83 D TLOF.

~~Surface-level heliports~~ Onshore heliports

4.2.1 The following obstacle limitation surfaces shall be established for a FATO at heliports with a PinS approach or departure procedure ~~utilizing a visual segment surface~~ with a proceed visually instruction:

a) Take-off climb surface ;

b) Approach surface ; and

c) Transitional surfaces.

~~Note 1:~~ *~~See Figure 4-3.~~*

Note ~~2~~: *The Procedures for Air Navigation Services — Aircraft Operations, (PANS-OPS, Doc 8168), Volume II, Part IV — Helicopters, details procedure design criteria.*

4.2.2 The following obstacle limitation surfaces shall be established for a FATO at heliports, other than specified in 4.2.1, including heliports with a PinS approach or departure procedure ~~where a visual segment surface is not provided~~ without a proceed visually instruction:

a) take-off climb surface; and

b) approach surface.

4.2.3 The slopes of the obstacle limitation surfaces shall not be greater than, and their other dimensions not less than, those specified in Table 4-1 ~~and shall be located as shown in Figures 4-1, 4-2 and 4-6.~~

4.2.4 Except for heliports facilitating performance class 1 operations, that have an approach/take-off climb surface with a 4.5 per cent slope design, objects shall be permitted to penetrate the obstacle limitation surface, if the results of an aeronautical study approved by an appropriate authority have reviewed the associated risks and mitigation measures.

Note: The identified objects may limit the heliport operation.

4.2.5 New objects or extensions of existing objects shall not be permitted above any of the surfaces in 4.2.1 and 4.2.2 except when shielded by an existing immovable object ~~or after an aeronautical study approved by PACA determines that the object will not adversely affect the safety or significantly affect the regularity of operations of helicopters.~~

4.2.6 Existing objects above any of the surfaces in 4.2.1 and 4.2.2 shall, as far as practicable, be removed except when the object is shielded by an existing immovable object ~~or after an aeronautical study approved by an appropriate authority determines that the object will not adversely affect the safety or significantly affect the regularity of operations of helicopters.~~

Note: *The application of curved approach or take-off climb surfaces and/or the utilization of vertical procedures ~~as specified in 4.1.5 or 4.1.18~~ may alleviate the problems created by objects infringing these surfaces.*

4.2.7 A ~~surface level~~ heliport shall have at least ~~one~~ two approach and take-off climb surfaces separated by not less than 135°. ~~An aeronautical study shall be undertaken by an appropriate authority when only a single approach and take-off climb surface is provided considering as a minimum, the following factors:~~

~~a) the area/terrain over which the flight is being conducted;~~
~~b) the obstacle environment surrounding the heliport and the availability of at least one protected side slope;~~
~~c) the performance and operating limitations of helicopters intending to use the heliport; and~~
~~d) the local meteorological conditions including the prevailing winds.~~

4.2.8 ~~*A surface level heliport should have at least two approach and take off climb surfaces to avoid downwind conditions, minimize crosswind conditions and permit for a balked landing.*~~

Table 4-1. ~~Dimensions and slopesof obstacle limitation surfaces for all visual FATOs~~ Approach and take-off climb slope design categories

Surface and dimensions	*Slope design categories*		
	A	*B*	*C*
Approach and take-off climb surface:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Helicopter ~~C~~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[c]	1 075 m[c]	1 220 m[c]
Transitional surface: ~~(FATOs with a PinS approach procedure with a VSS)~~			
Slope	50% (1:2)	50% (1:2)	50% (1:2)
Height	45 m[d]	45 m[d]	45 m[d]

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

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

c. This length may be reduced if vertical procedures are in place or extended/reduced if the approach or take-off climb surface is extended/reduced to meet the OCS of the PinS approach or departure procedure.

d. See 4.1.9 b).

Note.— Guidance on the application of slope categories is provided in the Heliport Manual *(Doc 9261).*

Note.— The slope design categories in Table 4-1 may not be restricted to a specific performance class of operation and may be applicable to more than one performance class of operation. The slope design categories depicted in Table 4-1 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. Consultation with helicopter operators will help to determine the appropriate slope category to apply according to the heliport environment and the most critical helicopter type for which the heliport is intended. Editorial Note.— Delete Figures 4-1 to 4-4 and Figure 4-6 and associated notes in toto. Figure 4-5 to be *renumbered* as Figure 4-1.

Editorial Note.— Delete Figures 4-1 to 4-4 and Figure 4-6 and associated notes in toto. Figure 4-5 to be *renumbered* as Figure 4-1.

~~Figure 4-1. Obstacle limitation surfaces — take-off climb and approach surface~~
~~Figure 4-2. Take-off climb/approach surface width~~
~~Figure 4-3. Transitional surface for a FATO with a PinS approach procedure with a VSS~~
~~Figure 4-4. Example of raised inclined plane during operations in performance class 1~~
~~*Note 1.— This example diagram 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 (HMF). Annex 6, Part 3, Attachment A provides back-up procedures that may be useful for operations in performance class 1.*~~
~~*Note 2.— The approach/landing profile may not be the reverse of the take-off profile.*~~
~~*Note 3.— Additional obstacle assessment might be required in the area that a back-up procedure is intended. Helicopter performance and the HFM limitations will determine the extent of the assessment required.*~~
~~Figure 4-5. Curved approach and take-off climb surface for all FATOs~~
~~Figure 4-6. Approach and take-off climb surfaces with different slope design categories~~

~~***Elevated heliports***~~

~~**4.2.9** The obstacle limitation surfaces for elevated heliports shall conform to the requirements for surface-level heliports specified in 4.2.1 to 4.2.6.~~

~~**4.2.10** An elevated heliport shall have at least one approach and take-off climb surface. An aeronautical study shall be undertaken by an appropriate authority when only a single approach and take-off climb surface is provided considering as a minimum, the following factors:~~

~~a) the area/terrain over which the flight is being conducted;~~

~~b) the obstacle environment surrounding the heliport and the availability of at least one protected side slope;~~

~~c) the performance and operating limitations of helicopters intending to use the heliport; and~~

~~d) the local meteorological conditions including the prevailing winds.~~

~~**4.2.11** An elevated heliport shall have at least two approach and take-off climb surfaces to avoid downwind conditions, minimize crosswind conditions and permit for a balked landing.~~

Helidecks

4.2.8 ~~12~~ A helideck shall have an obstacle-free sector.

Note: *A helideck may have a LOS (see 4.1.23 ~~6~~).*

4.2.9~~13~~ There shall be no fixed obstacles within the obstacle-free sector above the obstacle-free surface.

4.2.10 ~~14~~ In the immediate vicinity of the helideck, obstacle protection for helicopters shall be provided below the helideck level. This protection shall extend over an arc of at least 180 degrees with the origin at the centre of the FATO, with a descending gradient having a ratio of one unit horizontally to five units vertically from the edges of the FATO within the 180-degree sector. This descending gradient may be reduced to a ratio of one unit horizontally to three units vertically within the 180-degree sector for multi-engine helicopters operated in performance class 1 or 2. (See Figure 4-2 ~~7~~.)

4.2.11 ~~15~~ For a TLOF of 1 D and larger, within the 150-degree limited obstacle surface/sector out to a distance of 0.12 D measured from the point of origin of the limited obstacle sector, objects shall not exceed a height of 25 cm above the TLOF. Beyond that arc, out to an overall distance of a further 0.21 D measured from the end of the first sector, the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05 D above the level of the TLOF. (See Figure 4-3 ~~8~~.)

Note: *Where the area enclosed by the TLOF perimeter marking is a shape other than circular, the extent of the LOS segments are represented as lines parallel to the perimeter of the TLOF rather than arcs. Figure 4-3 ~~8~~ has been constructed on the assumption that an octagonal helideck arrangement is provided. Further guidance for square (quadrilateral) and circular FATO and TLOF arrangements is given in the Heliport Manual (Doc 9261).*

4.2.12 ~~16~~ For a TLOF less than 1 D within the 150-degree limited obstacle surface/sector out to a distance of 0.62 D and commencing from a distance 0.5 D, both measured from the centre of the TLOF, objects shall not exceed a height of 5 cm above the TLOF.

Beyond that arc, out to an overall distance of 0.83 D from the centre of the TLOF, the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05 D above the level of the TLOF. (See Figure 4-4 ~~9~~.)

Note.— Where the area enclosed by the TLOF perimeter marking is a shape other than circular, the extent of the LOS segments are represented as lines parallel to the perimeter of the TLOF rather than arcs. Figure 4-~~4~~9 has been constructed on the assumption that an octagonal helideck arrangement is provided. Further guidance for square (quadrilateral) and circular FATO and TLOF arrangements is given in the Heliport Manual *(Doc 9261).*

Shipboard heliports

4.2.13 The specifications in 4.2.16 ~~20~~ and 4.2.~~18~~ 22 shall be applicable for shipboard heliports completed on or after 1 January 2012.

4.2.17 To provide further protection from obstacles fore and aft of the TLOF, rising surfaces with gradients of one unit vertically to five units horizontally shall extend from the entire length of the edges of the two 150-degree sectors. These surfaces shall extend for a horizontal distance equal to at least 1 D of the largest helicopter the TLOF is intended to serve and shall not be penetrated by any obstacle. (See Figure 4-5 ~~10~~.)

4.2.19 From the fore and aft mid-points of the D circle in two segments outside the circle, limited obstacle areas shall extend to the ship's rail to a fore and aft distance of 1.5 times the fore-to-aft-dimension of the TLOF, located symmetrically about the athwartships bisector of the D circle. Within these areas there shall be no objects rising above a maximum height of 25 cm above the level of the TLOF. (See Figure 4-6 ~~11~~.) Such objects shall only be present if they do not represent a hazard to helicopters.

4.2.20~~24~~ A LOS horizontal surface shall be provided, at least 0.25 D beyond the diameter of the D circle, which shall surround the inboard sides of the TLOF to the fore and aft mid-points of the D circle. The LOS shall continue to the ship's rail to a fore and aft distance of 2.0 times the fore-to-aft dimension of the TLOF, located symmetrically about the athwartships bisector of the D circle. Within this sector there shall be no objects rising above a maximum height of 25 cm above the level of the TLOF.

Note: *Any objects located within the areas described in 4.2.19 ~~23~~ and 4.2.20 ~~24~~ that exceed the height of the TLOF are notified to the helicopter operator using a ship's helicopter landing*

area plan. For notification purposes it may be necessary to consider immoveable objects beyond the limit of the surface prescribed in 4.2.19 ~~24~~ particularly if objects are significantly higher than 25 cm and in close proximity to the boundary of the LOS. See the Heliport Manual Winching areas

4.2.21 An area designated for winching on-board ships shall be comprised of a circular clear zone of diameter 5 m and extending from the perimeter of the clear zone, a concentric manoeuvring zone of diameter 2 D. (See Figure 4-7 ~~12~~.)

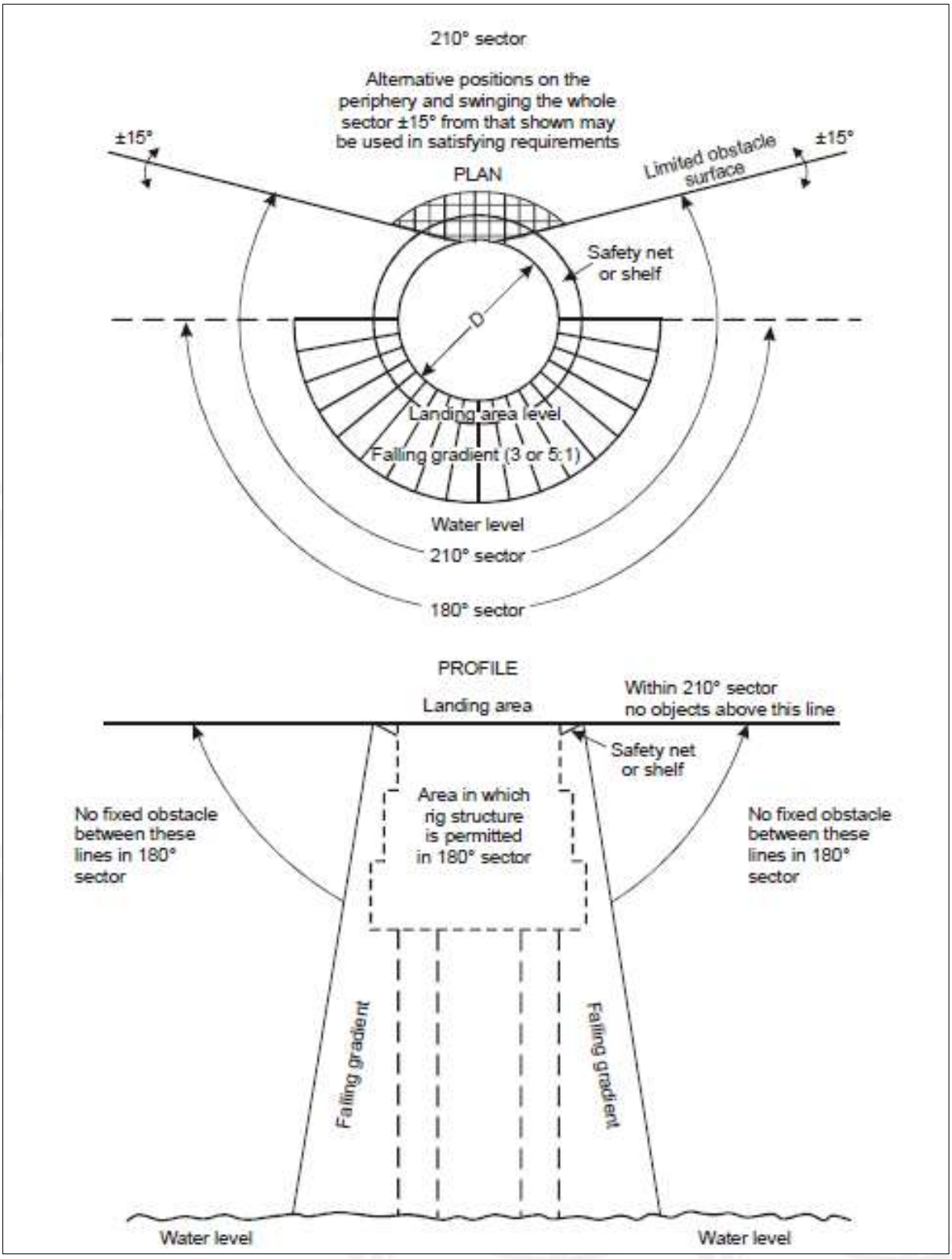


Figure 4-2 7. Helideck obstacle-free sector

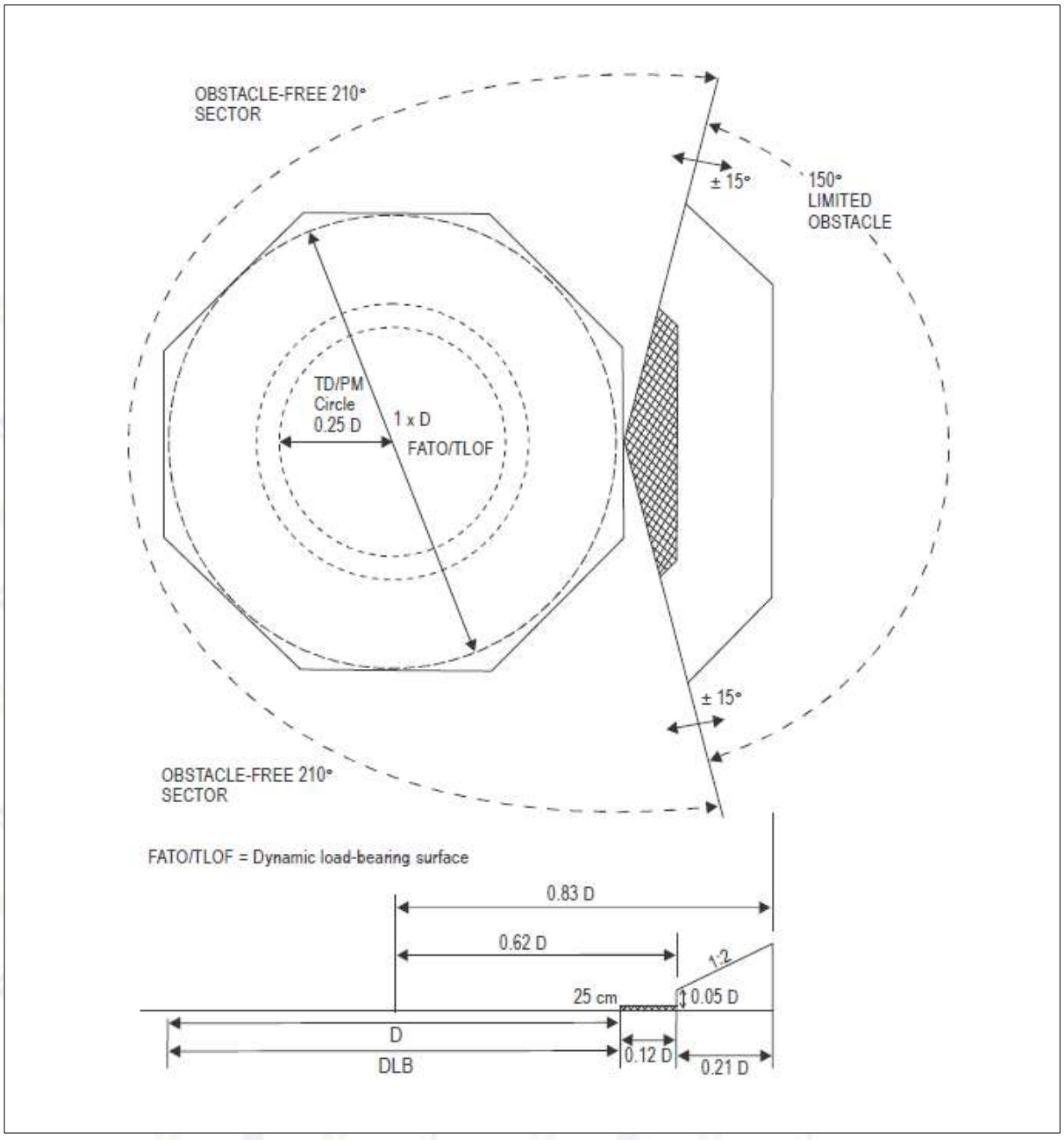


Figure 4-3 8. Helideck obstacle limitation sectors and surfaces for a FATO and coincidental TLOF of 1 D and larger

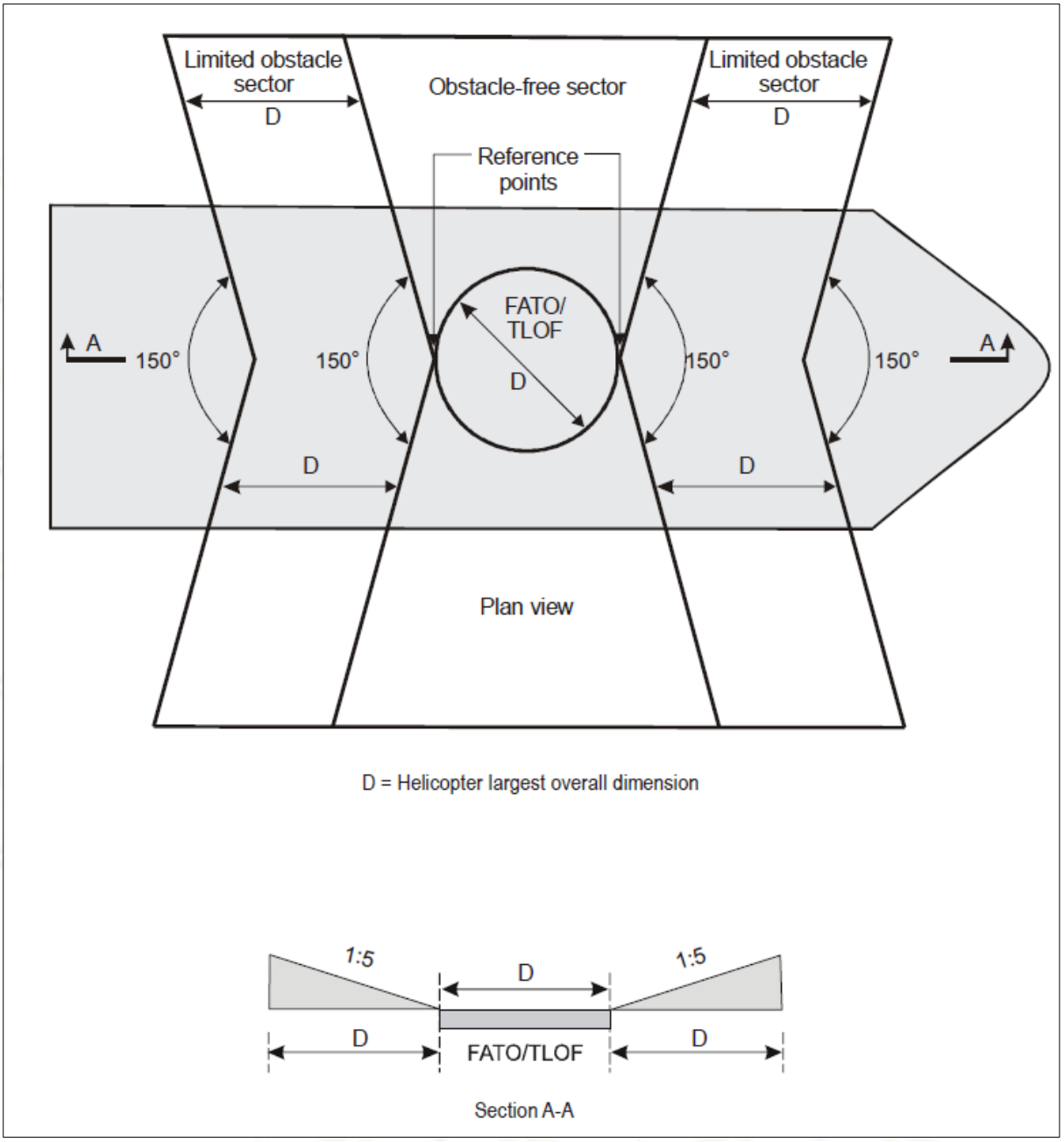
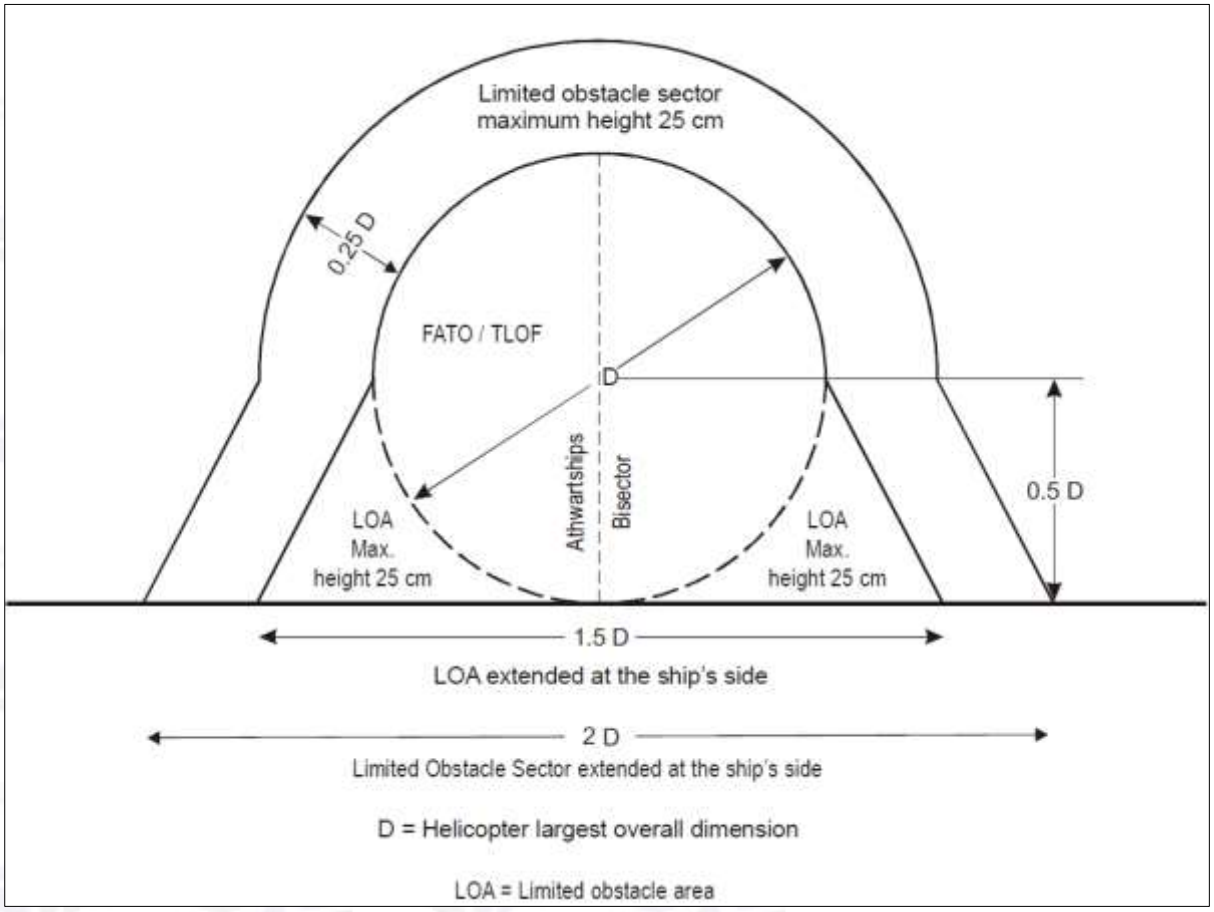


Figure 4-5 ~~10~~. Amidship's location — shipboard heliport obstacle limitation surfaces



(Doc 9261) for guidance.

Figure 4-6 ~~11~~. Ships-side non-purpose-built heliport obstacle limitation sectors and surfaces

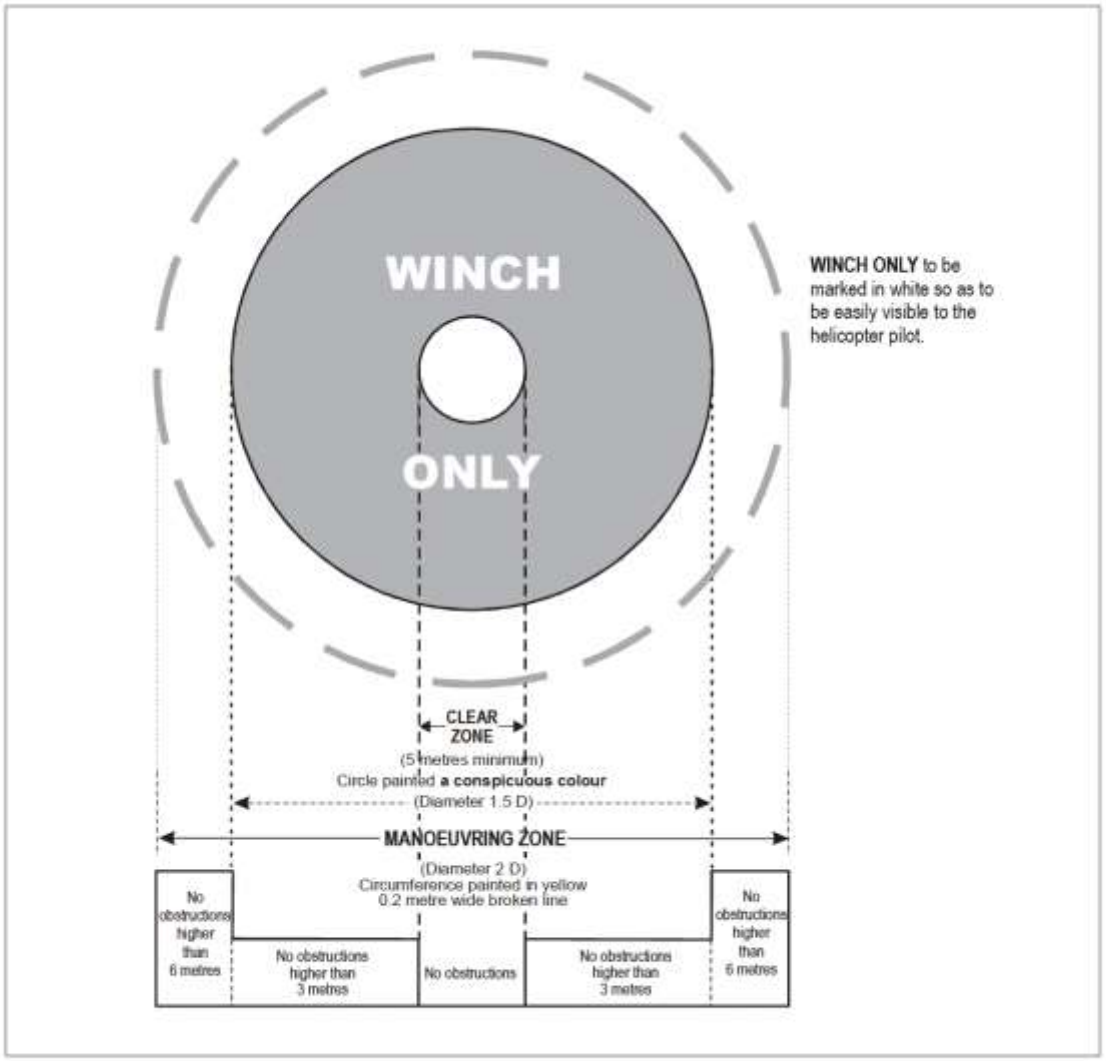


Figure 4-712. Winching area of a ship

CHAPTER 5 – VISUAL AIDS

5.2.14 Helicopter taxi-route markings and markers

Location

5.2.14.2 A helicopter taxi-route centre line marking or ~~flush in-ground centre line~~ markers shall be located along the centre line of the helicopter air taxiway.

5.2.14.4 A helicopter air taxi-route centre line, ~~when on an unpaved surface~~ that will not accommodate painted markings, shall 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.

5.3 Lights

Note 6: *In cases where operations into a heliport are to be conducted at night with Night Vision Imaging Systems (NVIS), it is important to ensure ~~establish the compatibility of the NVIS system with~~ all heliport lighting are compatible with the NVIS such as through the addition of infrared emitters to the heliport lighting. Where such additional measures are not practicable, helicopter operators using NVIS are to be made aware of it. ~~an assessment by the helicopter operator prior to use.~~*

5.3.2 Heliport beacon

Note.— The objective of a heliport beacon is to make a heliport more conspicuous to assist the pilot to locate and identify the heliport at night and/or by day in reduced visibility.

Characteristics

5.3.2.3 The heliport beacon shall emit repeated series of equispaced short duration white flashes in the format in Figure 5-11 ~~0~~.

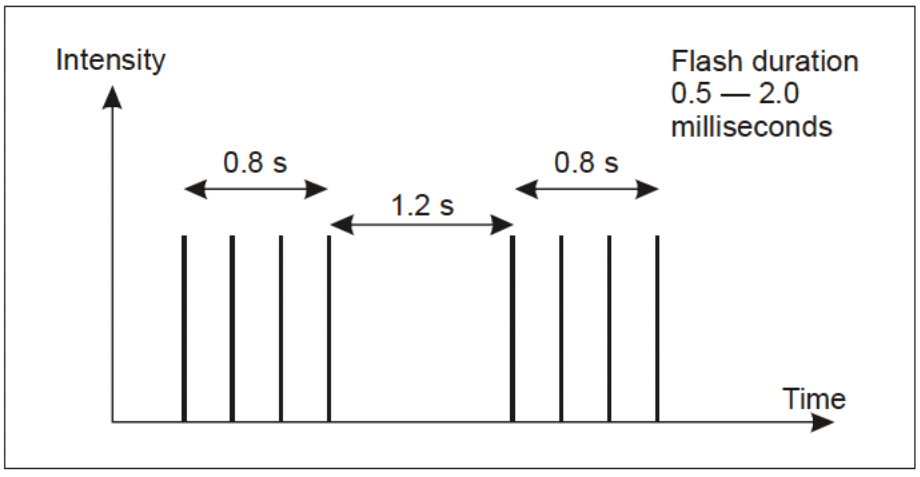


Figure 5-11. Heliport beacon flash characteristics

5.3.3 Approach lighting system

Note: *The objective of an approach lighting system is to allow the helicopter operator, by day and night, to visually identify the heliport and align the helicopter on the centreline of the FATO upon arriving at a prescribed point on the approach flight path.*

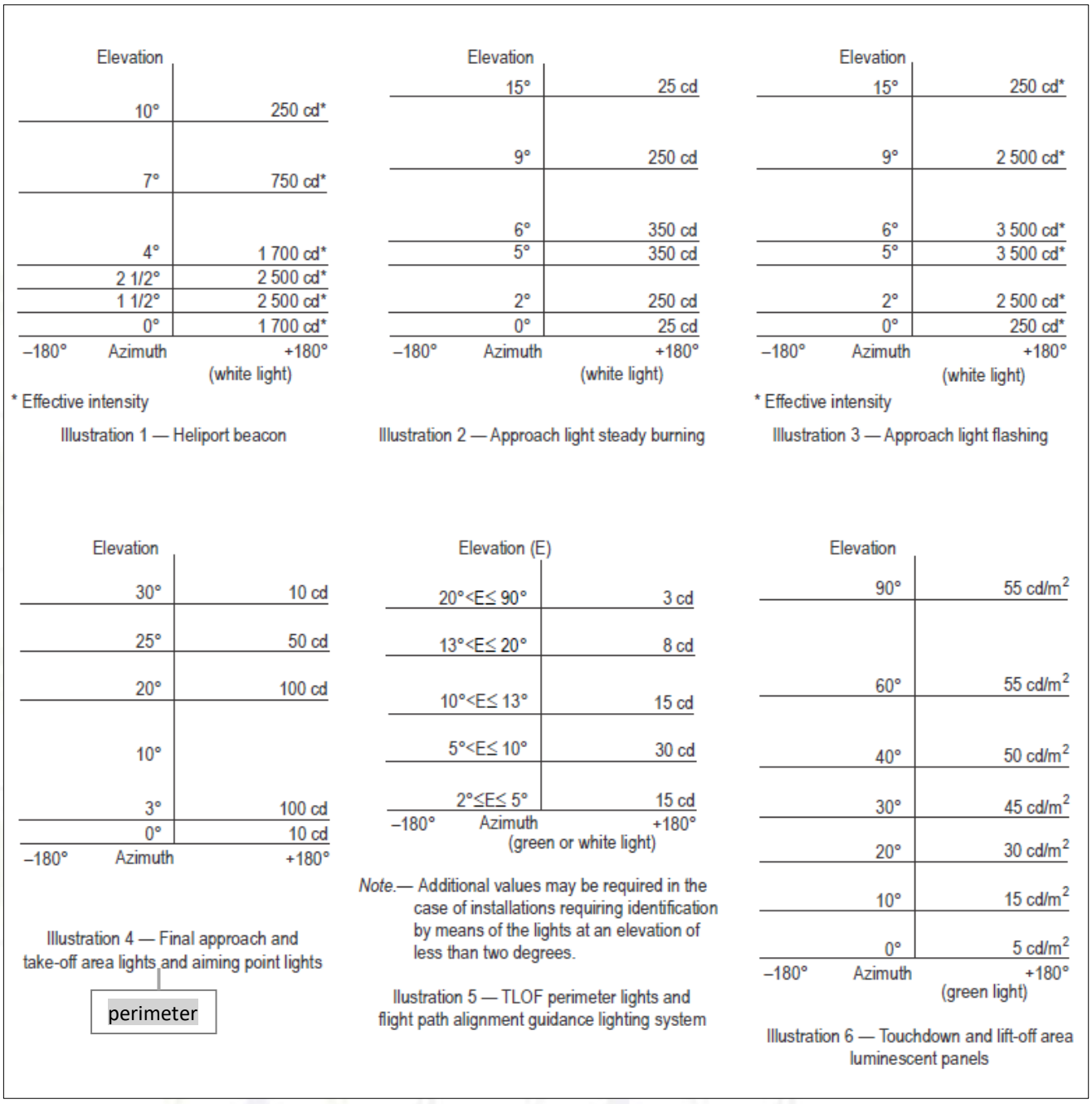


Figure 5-12. Isocandela diagrams

5.3.7 ~~Final approach and take-off area lighting systems~~ FATO perimeter lights for onshore surface-level heliports

Note: *The objective of ~~a final approach and take-off area lighting system~~ FATO perimeter lights for onshore surface-level heliports is to provide to the pilot operating at night an indication of the shape, location and extent of the FATO.*

Application

5.3.7.1 Where a FATO with a solid surface is established at a surface-level heliport intended for use at night, FATO perimeter lights shall be provided except that they may be omitted where the FATO and the TLOF are nearly coincidental or the extent of the FATO is self-evident.

Characteristics

5.3.7.3 FATO perimeter lights shall be fixed omnidirectional lights showing green or white with variable intensity. ~~Where the intensity of the lights is to be varied the lights shall show variable white.~~ Green perimeter lights shall be permitted only when the FATO is a dynamic load-bearing surface.

5.3.7.4 The light distribution of FATO perimeter lights shall be as shown in Figure 5-11, Illustration.

Characteristics

5.3.8.3 Aiming point lights shall form a pattern of at least six omnidirectional white lights as shown in Figure 5-7. The lights shall be arranged equidistantly with a light at the apex and at both corners. The lights shall be inset when a light extending above the surface could endanger helicopter operations.

5.3.9 Touchdown and lift-off area lighting system

Application

Note: *Where a TLOF is located in a stand, the objective may be met with the use of ambient lighting or stand floodlighting (see 5.3.10).*

5.3.9.2 For a surface-level heliport, Lighting for the TLOF in a FATO shall consist of either one or more of the following:

a) perimeter lights;

~~b) floodlighting;~~

c) arrays of segmented point source lighting (ASPSL) or luminescent panel (LP) lighting to identify the TLOF perimeter when a) is ~~and b)~~ are not practicable and FATO perimeter lights are available.

5.3.9.3 For an elevated heliport, shipboard heliport or helideck, lighting of the TLOF in a FATO shall consist of:

a) perimeter lights; and

b) ASPSL and/or LPs to identify the TDPC ~~M~~ and/or floodlighting to illuminate the TLOF.

~~Note:~~ *~~At elevated heliports and helidecks, shipboard heliports surface texture cues within the TLOF are essential for helicopter positioning during the final approach and landing. Such cues can be provided using various forms of lighting (ASPSL, LP, floodlights or a combination of these lights, etc.) in addition to perimeter lights. Best results have been demonstrated by the combination of perimeter lights and ASPSL in the form of encapsulated strips of light emitting diodes (LEDs) and inset lights to identify TDPM and heliport identification markings. Guidance on suitable systems is contained in the Heliport Manual (Doc 9261).~~*

5.3.9.4 When enhanced surface texture cues are required at a TLOF ASPSL and/or LPs to identify the TDPC ~~M~~ marking and/ or floodlighting shall be provided at a surface-level heliport intended for use at night ~~when enhanced surface texture cues are required.~~

Location

5.3.9.5 TLOF perimeter lights shall be placed along the edge of the area designated for use as the TLOF or within a distance of 1.5 m from the outer edge. TLOF perimeter lights shall be uniformly spaced at intervals of not more than 3 m for elevated heliports, helidecks and shipboard heliports and not more than 5 m for surface-level heliports. ~~Where the TLOF is a circle the lights shall be:~~

~~a) located on straight lines in a pattern which will provide information to pilots on drift displacement; and~~

~~b) where a) is not practicable, evenly spaced around the perimeter of the TLOF at the appropriate interval, except that over a sector of 45 degrees the lights shall be spaced at half spacing.~~

5.3.9.6 ~~TLOF perimeter lights shall be uniformly spaced at intervals of not more than 3 m for elevated heliports and helidecks and not more than 5 m for surface-level heliports. There shall be a minimum number of four lights on each side including a light at each corner. For a circular TLOF, where lights are installed in accordance with 5.3.9.5 b) there shall be a minimum of fourteen lights.~~

Note: *Where the TLOF is circular, drift of the helicopter may be difficult to discern by the pilot. Guidance on lighting patterns to counter drift displacement over the TLOF ~~this issue~~ is contained in the Heliport Manual (Doc 9261).*

~~**5.3.9.9** On surface-level heliports the minimum number of LPs on a TLOF shall be nine. The total length of LPs in a pattern shall not be less than 50 per cent of the length of the pattern. There shall be an odd number with a minimum number of three panels on each side of the TLOF including a panel at each corner. LPs shall be uniformly spaced with a distance between adjacent panel ends of not more than 5 m on each side of the TLOF.~~

~~**5.3.9.10** When LPs are used on an elevated heliport or helideck to enhance surface texture cues, the panels shall not be placed adjacent to the perimeter lights. They shall be placed around a touchdown marking or coincident with heliport identification marking.~~

5.3.9.9 TLOF floodlights where provided shall be arranged ~~located~~ so as to avoid glare to pilots in flight and ~~or~~ to personnel working on the area. ~~The arrangement and aiming of floodlights shall be such that shadows are kept to a minimum.~~

Note: ~~*ASPSL and LPs used to designate the TDPM and/or heliport identification marking have been shown to provide enhanced surface texture cues when compared to low-level floodlights. Due to the risk of misalignment, if floodlights are used, there will be a need for them to be checked periodically to ensure they remain within the specifications contained within 5.3.9.*~~ *Detailed specifications on the number of lights to be provided, based on the shape and size of the TLOF are contained in the Heliport Manual (Doc 9261).*

5.3.9.18 The ASPSL and LPs shall not extend above the surface by more than 2.5 cm.

Note: *Guidance on panel profiles and loading limitations is contained in the* Heliport Manual *(Doc 9261).*

~~**5.3.20**~~ ***Note:*** *The light distribution of the ASPSL and/or LPs used to illuminate the TDPC and heliport identification marking, or cross (chevron) markings at a hospital, are detailed in the Heliport Manual (Doc 9261).* ~~*shall be as shown in Figure 5-11, Illustration 6.*~~

~~**5.3.21** The average horizontal illuminance of the floodlighting shall 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.~~

~~**5.3.22** Lighting used to identify the TDPC marking shall comprise a segmented circle of omnidirectional ASPSL strips showing yellow. The segments shall consist of ASPSL strips, and the total length of the ASPSL strips shall not be less than 50 per cent of the circumference of the circle.~~

5.3.9.21 If utilized, the heliport identification marking lighting, or cross marking lighting at a hospital, shall be omnidirectional showing green.

5.3.14 Floodlighting of obstacles

Note: *The objective of obstacle floodlighting is to highlight the shape and location of obstacles in the vicinity of the heliport, to assist a pilot flying at night to avoid all obstacles by a safe margin.*

END

Attached Comment Response Document

CAR-139 PART II

Aerodrome Certifications, Design and Operation

Stakeholder: Click or tap here to enter text

# ID	CARs Reference	Subject/ Comment (s)	CAA Response
1			☐Not Accepted ☐ Accepted ☐ Partially accepted ☐Noted Justification (if any):
2			☐Not Accepted ☐ Accepted ☐ Partially accepted ☐Noted Justification (if any):