International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Tel.: +1 514-954-8219 ext. 6717

Ref.: AN 4/1.1.58-23/32 27 April 2023

Subject: Proposal for the amendment of Annex 14, Volume II concerning heliport specifications

Action required: Comments to reach Montréal by 27 October 2023

Sir/Madam,

1. I have the honour to inform you that the Air Navigation Commission (ANC), at the seventh meeting of its 222nd Session held on 23 March 2023, considered proposals developed by the fourth meeting of the Aerodrome Design and Operations Panel (ADOP/4) to amend Annex 14 — *Aerodromes*, Volume II — *Heliports*.

2. The proposal introduced amendments related to certification and a safety management system (SMS) at heliports, obstacle limitation surfaces and visual aids (lighting) associated with heliports. The Commission authorized the transmission of the proposal to Contracting States and appropriate international organizations for comments.

3. The proposals for amendment to Annex 14, Volume II are contained in Attachment A. To facilitate your review of the proposed amendments, a rationale box providing more information has been included immediately following each proposal.

4. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the ANC during its final review of the draft amendment.

5. May I request that any comments you wish to make on the amendment proposals be dispatched to reach me not later than 27 October 2023. To facilitate the processing of replies with substantive comments, I invite you to submit an electronic version in Word format to icaohq@icao.int. The ANC has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council. In this connection, should you anticipate a delay in the receipt of your reply, please let me know in advance of the due date.

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6. In addition, proposed amendments to Annex 14, Volume II are envisaged for applicability on 27 November 2025; except for proposed amendments related to certification and an SMS for heliports which should be indicated as 26 November 2026. Any comments you may have thereon would be appreciated.

7. The subsequent work of the ANC and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the amendment proposals.

8. Please note that for the review of your comments by the ANC and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments” or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment B which may be completed and returned together with your comments, if any, on the proposals in Attachment A.

Accept, Sir/Madam, the assurances of my highest consideration.

Juan Carlos Salazar
Secretary General

Enclosures:

A — Proposed amendment to Annex 14, Volume II
B — Response form

ATTACHMENT A to State letter AN 4/1.1.58-23/32

PROPOSED AMENDMENT TO ANNEX 14, VOLUME II

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

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:

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

PROPOSED AMENDMENT TO

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AERODROMES

ANNEX 14

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME II (HELIPORTS)

INITIAL PROPOSAL 1
Table of Contents, Definitions and Abbreviations

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ABBREVIATIONS AND SYMBOLS
(used in Annex 14, Volume II)

Abbreviations

AIP	Aeronautical Information Publication
. . .	
HAPI	Helicopter approach path indicator
HFM	Helicopter flight manual (also known as RFM)
Hz	Hertz
IDF	Initial departure fix
kg	Kilogram
. . .	
NVIS	Night vision imaging systems
OCS	Obstacle clearance surface
OFS	Obstacle-free sector
. . .	
PinS	Point-in-space
PRP	Point-in-space reference point
RFF	Rescue and firefighting
RFFS	Rescue and firefighting service
RFM	Rotorcraft flight manual (also known as HFM)
R/T	Radiotelephony or radio communications

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CHAPTER 1. GENERAL

~~*Introductory*~~ *Note 1.— Annex 14, Volume II, contains Standards and Recommended Practices (specifications) 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: the largest set of dimensions* ~~*and*~~*; the greatest maximum take-off mass (MTOM); and the most critical obstacle avoidance criteria the heliport is intended to serve,* ~~*would need to be considered*~~ *is used. For guidance on establishing a design helicopter see the* Heliport Manual *(Doc 9261).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	The note has been expanded to take account of the importance of assessing the critical obstacle avoidance criteria for the design helicopter in the process of designing a heliport.

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

1.1 Definitions

Annex 14, Volume I, contains definitions for the terms which are used in both volumes. Those definitions are not reproduced in this volume, with the exception of the following two, which are included for ease of reference:

Heliport. 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.

. . .

The following list contains definitions of terms that are used only in Volume II, with the meanings given below.

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.

Origin:	*Rationale:*
HDWG/14 ADOP/4	This is a new surface for vertical procedures; it defines the path that a helicopter is expected to follow from the FATO to the take-off decision point (TDP) and vice versa.

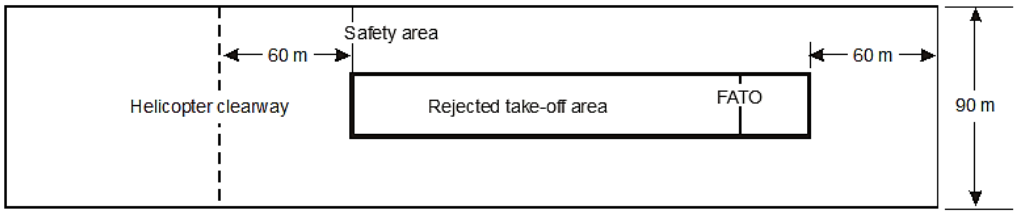
D. The largest overall dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane or helicopter structure.

Design D. The D of the design helicopter.

D-value. A limiting dimension, in terms of "D", for a heliport, helideck or shipboard heliport, or for a defined area within.

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	To provide a definitive vertical boundary for elevated obstacle limitation surfaces, the inner edge of the elevated obstacle limitation surface (OLS), or clearway, is required to be positioned directly above the outer edge of the safety area. The proposed amendment provides a flexible objective that allows this but also permits the implementation of the current configuration for instrument heliports as depicted in Figure A-1. Safety area for instrument FATO which shows a (partially) coincidental clearway and safety area.  **Figure A-1. Safety area for instrument FATO** The proposed amendment would also provide an opportunity for a symmetrical safety area for both the take-off and landing when the backup surface requires a larger displacement than is currently provided by the minimum safety area described in Chapter 3. *Note.— Guidance material on backup surfaces are provided in Heliport Manual (Doc 9261).*

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.

Dynamic load-bearing surface. A surface capable of supporting the loads generated by a helicopter in motion.

Elevated heliport. A heliport located on a raised structure on land.

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

Elongated. When used with TLOF or FATO, elongated means an area which has a length more than twice its width.

Final approach and take-off area (FATO). 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 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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	With the advent of other than runway-type Category A procedures, the attributes required of a clearway are no longer the same as those for aeroplanes. For this reason, a simpler base definition is proposed leaving the attributes to be captured in further definitions (elevated helicopter clearway) or in the body of the Annex. In addition, achievement of "a specific height" is no longer the sole target; it may be one, or more, of a number of flight conditions.

Helicopter stand. A defined area intended to accommodate a helicopter for purposes of: loading or unloading passengers, mail or cargo; fuelling, parking or maintenance; and, where air taxiing operations are contemplated, the TLOF.

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Heliport reference point (HRP). The designated location of a heliport.

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 a~~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~~The 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 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).*

Protection area. A defined area surrounding a stand intended to reduce the risk of damage from helicopters accidentally diverging from the stand.

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

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Touchdown/positioning marking (TDPM). A marking or set of markings providing visual cues for the positioning of helicopters.

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

Origin:	*Rationale*:
HDWG/14 ADOP/4	These definitions are intended to encapsulate those Category A procedures that are for other than runway-types departures/arrivals.

Winching area. An area provided for the transfer by helicopter of personnel or stores to or from a ship.

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INITIAL PROPOSAL 2
Heliport Certification and SMS

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 Annex 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 States shall certify heliports used for international operations in accordance with the specifications contained in this Annex as well as other relevant ICAO specifications through an appropriate regulatory framework.

Note 1.— In addition to certifying heliports intended to be used by helicopters in international civil aviation, certifying heliports that are open to public use is deemed also to be beneficial for the safety, regularity and efficiency of these operations.

Note 2.— Guidance on heliport certification, including the interrelations between the aerodrome and heliport certification processes in case of co-location on an aerodrome, can be found in the Heliport Manual *(Doc 9261).*

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

Note.— Guidance on a regulatory framework is given in the Heliport Manual *(Doc 9261*).

1.4.3 As part of the certification process, States shall ensure 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/acceptance prior to granting the heliport certificate.

Note 1.— Guidance on the contents of a heliport manual, including procedures for its submission and approval/acceptance, verification of compliance and granting of a heliport certificate, can be found in the Heliport Manual *(Doc 9261).*

Note 2.— Annex 19 — Safety Management *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).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	In seeking to discharge actions placed on the Heliport Design Working Group (HDWG) by the ANC as reflected in Job Card ADOP010.04 (WPE Nos. 9481 and 9482), certification of heliports is being introduced to Annex 14, Volume II. According to paragraph 1.4.4, it will be a condition of the certification process that heliport operators are able to demonstrate effective organization and management of the heliport by implementing an SMS. Without an effective SMS, it is not possible for an operator to demonstrate a proactive approach to managing safety performance and continuous safety improvements. The requirement to implement an SMS is underpinned by proposed provisions for Amendment 2 to Annex 19 — *Safety Management*.

INITIAL PROPOSAL 3
Obstacle limitation surfaces at heliports and related provisions

CHAPTER 2. HELIPORT DATA

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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:

a) heliport type — surface-level, elevated, shipboard or helideck;

. . .

f) apron — surface type, helicopter stands;

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The text has been amended to facilitate promulgation of the elevation of the helicopter clearway, approach and take-off climb surface.

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CHAPTER 3. PHYSICAL CHARACTERISTICS

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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 should a forced landing be 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).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	The text has been amended to allow vertical procedures (conversion of height to speed) and facilitate the elevation of the helicopter clearway.

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3.2 Helidecks

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3.2.1 The specifications in paragraphs 3.~~3~~2.14 and 3.~~3~~2.15 shall be applicable for helidecks completed on or after 1 January 2012.

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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).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Standard 3.2.4 already gives acceptance for a TLOF to be no smaller than 0.83D but, in the absence of any formal risk assessment process, was limited to those helicopters certificated under CS-27 i.e., with a maximum certificated take-off mass of <3175kg. However, now with the introduction of a formal risk assessment process into the 2021, fifth edition of the *Heliport Manual* (Doc 9261), which permits the TLOF to be less than 1.0D, but not less than 0.83D, there is no logical reason why the risk assessment process should be tied to a specific helicopter mass discriminant. The principle has been established to allow the TLOF to be less than 1D for any helicopter, providing the FATO (for helicopter containment) is not less than 1.0D. Notwithstanding this, it is still a recommendation of 3.2.5 that the TLOF should be no less than 1.0D.

3.2.5 **Recommendation.**— ~~*For helicopters with a MTOM of 3 175 kg or less, t*~~*The TLOF should 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.*

3.2.6 A helideck shall be arranged to ensure that a sufficient and unobstructed air-gap is provided which encompasses the full dimensions of the FATO.

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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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The frangibility requirement for objects installed around a helideck TLOF are to be removed as this is considered to be an unrealistic aspiration for helicopter operations. This was incorporated based on the outcomes of a study conducted in 1998 by the Frangible Aids Study Group, which concluded that looking into the fragility of the tail rotor, it was suggested to reduce the height of the objects rather than to seek them to be frangible. For helicopters, the issue of frangibility is complicated by the necessity to relate it to zero speed and tail rotor vulnerability/fragility; for these reasons it has been argued that it is difficult, if not impossible, to establish a standard for object frangibility that can be practically applied to helideck operations. Instead, the permitted height of essential objects around the TLOF has been reduced down to mitigate incidences of helicopters striking objects around the helideck.

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3.3 Shipboard heliports

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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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The frangibility requirement for objects installed around a shipboard heliport TLOF are to be removed as this is considered to be an unrealistic aspiration for helicopter operations. For helicopters, the issue of frangibility is complicated by the necessity to relate it to zero speed and tail rotor vulnerability/fragility; for these reasons it has been argued that it is difficult, if not impossible, to establish a standard for object frangibility that can be practically applied to shipboard heliport operations. Instead, the permitted height of essential objects around the TLOF has been reduced to mitigate incidences of helicopters striking objects around a shipboard heliport.

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CHAPTER 4. OBSTACLE ENVIRONMENT

Origin:	*Rationale*:
HDWG/14 ADOP/4	**General** The introduction of the fifth edition of the *Heliport Manual* (Doc 9261) in 2021 in addition to providing a detailed description of the process and elements of heliport design, offered an opportunity to separate SARPs from guidance and suggested means of compliance. The result of this separation provided an opportunity to allow more imaginative solutions for heliport surfaces in circumstances where many heliports no longer have runway-type FATOs and are not situated in large open areas; most are on small sites located where the versatility of the helicopter permits operations inaccessible to fixed wing aircraft. The location of new heliports in congested areas has also necessitated the elevation of the facilities to the tops of buildings to raise them above the obstacle environment. The lack of surface area in these elevated sites, has required a reassessment of the attributes of some defined areas resulting in the necessity for a solid surface being removed from some or transferred to others. These concepts are already reflected in the Doc 9261 but have resulted in the necessity to re-balance and harmonize the SARPs with guidance provided in the manual. In addition to amendments to the SARPs, there has been a necessity to reposition of some of the explanatory notes, guidance and illustrating figures from Annex 14, Volume II to Doc 9261. The objective of existing standards in the SARPs have not been changed, mostly they have been modified or extended to allow the flexibility required for the introduction of heliports in rich obstacle environments. **Significant Amendments** The most important change is the introduction of "vertical procedures"; this has permitted the integration of heliport design and helicopter procedures in the provision of heliport surfaces. Existing SARPs for the approach and take-off climb surfaces, which already permit the elevation of the origin, have been extended to include modification of the location and dimensions of the inner edge to suit the type of arrival or departure. These SARPs also now allow an extension of the outer edge so that it connects with the PinS arrival or departure procedure (when a proceed visual instruction is defined). Existing SARPs for the transitional surface have been extended to allow for its re-use with vertical procedures both for arrival and departure. Because the upper limit of the vertical procedure is not fixed, the upper edge of the transitional surface may now be raised to match the upper limit of the ascent/descent surface. There has been a modification of the SARPs to restore the practice of allowing more than one turn in the arrival and departure surfaces. This was removed, in error, in an earlier amendment to the SARPs. Table 4-1 has been amended to accord with the amendments made to the SARPs. The rationale and justification for all these changes, and others, may be found embedded in the text at the appropriate location.

Note.— The objectives of the specifications in this chapter are to describe the airspace around heliports so as to permit intended helicopter operations to be conducted safely and to prevent, where appropriate State controls exist, heliports from becoming unusable by the growth of obstacles around them. This is achieved by establishing a series of obstacle limitation surfaces that define the limits to which objects may project into the airspace.

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	Figures 4-1 to 4-4 and Figure 4-6 currently in Doc 9261 have been removed from Annex 14, Volume II to avoid duplication and redundancy. Notes which are general to the SARPs have been placed at the head of the section. (No Further comment is provided where notes in the text, or figures, have been, deleted).

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 ~~end of the safety area~~ and centred on a line passing through the centre of the FATO.

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

Origin:	*Rationale*:
HDWG/14 ADOP/4	The text has been simplified and allow placement of the inner edge at, or directly above, the outer edge of the safety area. It also permits an increase in the width when vertical procedures with a lateral extend are used, in accordance with Appendix A of Chapter 4 of the *Heliport Manual* (onshore).

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The standard elevation of the approach surface outer edge will be 152 m (500 ft) - except when a PinS procedure is in place. In order to provide continuity between the OLS and the OCS when a PinS procedure is provided, the outer edge of the approach surface should be extended/reduced to the point where the approach surface meets the PinS OCS. This will provide continuity.

4.1.3 The elevation of the inner edge shall be:

a) ~~t~~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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The amendment is to facilitate the use of vertical procedures. The elevation of the origin of the OLS will be sufficient to clear all obstacles in the approach surface with the designated slope (most multi-engine helicopters can comfortably achieve a type C slope (12.5%)). The flight path to the FATO and location and height of the LDP should consider: the level and slope of the OLS; the balked landing requirement; and the ascent/descent surface.

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

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).*

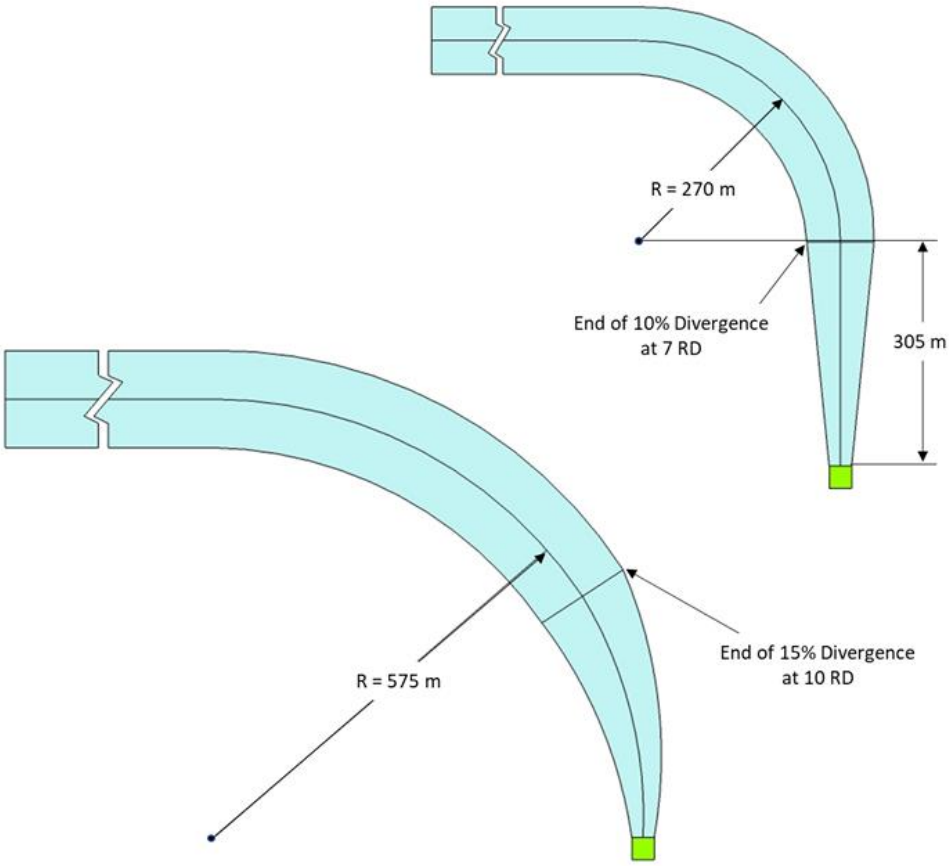


Figure 4-~~5.~~1. Curved approach and take-off climb surface for all FATOs

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

Origin:	*Rationale*:
HDWG/14 ADOP/4	The provision for more than one turn was removed from the Annex because it was assumed that all approach surfaces would be of *Type C*. This may not be the case; for that reason, the limiting Standard is removed, and the subject addressed in section 4.1.1.7 of the *Heliport Manual* (Doc 9261).

4.1.6~~7~~ Where a curved portion of ~~an~~ a design category B or C 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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	See Rationale for 4.1.17.

4.1.78 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.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The transitional surface is normally provided for the protection of a helicopter when conducting a PinS approach procedure with a proceed visually instruction. However, when a *vertical procedure* with a lateral component is facilitated, the helicopter requires protection from buildings and other obstacles in the close vicinity or proximity of the heliport. To avoid defining an additional protected surface, the *transitional surface* has been designated to provide this protection; its geometry can also be used in a more limited way to protect the helicopter when a backup procedure without a lateral component is defined. The slope 1:1.5 (34°) of the *ascent/descent surface* has been shown to match the vertical paths (both ascending and descending) of the vertical procedures of modern helicopter types. The utilization of a *transitional surface* when vertical procedures are in use provides a safety margin of 12.5% (plus the width of the safety area) between the ascent/descent surface and the 1:2 (27°) slope of the *transitional surface.*

4.1.89 *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.*~~

4.1.910 *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

Origin:	*Rationale*:
HDWG/14 ADOP/4	The single term *approach* and *take-off climb* surface has been separated into its two separate elements to ensure they are addressed as separate entities. In earlier editions of the Annex, the transitional surface was applied only to the instrument approach surface. When the text was amended, there was an implicit assumption that the approach and departure surfaces would always be the same – i.e. a Type C 12.5% slope. Whilst it is correct that PANS-OPS shows only a Type C approach surface, it is noted that other slopes are available.

	A transitional surface may also provide protection when a vertical procedure with a lateral component has been provided. This allows a flexible arrangement where the approach and departure procedures are not of the same type.

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	When a transition surface is used in conjunction with vertical procedures, the upper edge of the *transitional surface* should be at least 15 m (50 ft) above the upper edge of the *ascent/descent* surface - as shown in Appendix A to Chapter 4 of the *Heliport Manual* (Doc 9261). Note: because of the necessity for drop-down, the TDP/LDP will not be less than 30 m (100 ft) above the FATO; as the TDP/LDP is raised to provide clearance from obstacles in the flight path, the upper level of the transitional surface will have to be extended upwards to continue to provide protection.

4.1.10~~1~~ 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; then ~~and~~

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

~~b~~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.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	Because use of the *vertical procedure* requires the inner edge of the approach or take-off climb surface to be elevated, the level of the *helicopter clearway* and *inner edge* will be at a different level to the *safety area*. As shown in Figure II-4-A-8 and Figure II-4-A-14 of Appendix A to Chapter 4 of the *Heliport Manual* (Doc 9261), the lower edge of the transitional surface will descent from inner edge of the helicopter clearway, or approach surface, directly to the outer edge of the safety area.

4.1.112 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

4.1.123 *Description.* An inclined plane, a combination of planes or, when a turn is or turns 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 Table 4-1 for dimensions and slopes of surfaces. See Figures 4-1, 4-2, 4-3 and 4-4 for depiction of surfaces.

4.1.134 *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:

1) when located at the outer edge of the safety area or helicopter clearway, 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; or

2) when located at the outer edge of the elevated helicopter clearway, the elevated helicopter clearway.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The take-off climb surface section has been amended to facilitate the use of vertical procedures. The Standard allows the width of the inner edge to conform to the width of the surface to which it is attached: The normal case is the width of the safety area or helicopter clearway at, or close to, the elevation of the FATO. When vertical procedures are being utilized the width of the inner edge will be the width of the elevated helicopter clearway which, for a pure backup procedure will be as above, but, with a lateral component, should be wider – as shown in Appendix A to Chapter 4, 2.1.3 (d of Doc 9261, *Heliport Manual*.

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:

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The standard elevation of the outer edge will be 152 m (500 ft) - except when a PinS procedure is in place. To provide continuity between the OLS and the OCS when a PinS procedure is provided, the outer edge of the take-off climb surface may be extended/reduced to the point where the approach surface meets the PinS OCS.

4.1.145 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.

~~4.1.16 Where 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.~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The take-off climb surface section has been amended to facilitate the use of vertical procedures. The Standard now allows the elevation of the inner edge to align with the elevation of the surface to which it is attached: The normal case is the elevation of the safety area or helicopter clearway at, or close to, the elevation of the FATO. *When vertical procedures are being utilized the elevation of the inner edge will be:* that of the helicopter clearway at the level of the FATO (this is the standard back-up procedure without an elevated helicopter clearway); or that of the elevated helicopter clearway (this is the case with an elevated helicopter clearway).

4.1.157 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.

4.1.168 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 4-51. For guidance on construction of turns in approach or take-off climb surfaces see the Heliport Manual *(Doc 9261).*

~~4.1.19 In the case of a take-off climb surface involving a turn, the surface shall not contain more than one curved portion.~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The removal of this Standard restores the original intent of ICAO to permit more than one turn in the take-off climb surface. The removal of this allowance was based upon a misunderstanding that all surfaces would be of type C.

4.1.1720 Where a curved portion of a design category B or C 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 shall not be less than 575 m.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The presence of a straight section or reduced radius of turn has been limited to the type B or type C surfaces. At a performance class (PC) 1 heliport with a type A slope, the helicopter should be in a stable OEI climb before the end of the TODAH prior to reaching the OLS. At a PC 1 heliport with a type A slope, without an elevated OLS origin, operations in PC 2 and 3 can make use of the length of the TODAH to achieve a stable climb attitude and speed prior to reaching the OLS.

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.

4.1.1821 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 or 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

4.1.1922 *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.

4.1.2023 *Characteristics.* An obstacle-free sector/surface shall subtend an arc of specified angle.

4.1.2124 A helideck obstacle-free sector shall comprise of two components, one above and one below helideck level:

Note.— See Figure 4-2~~7~~.

. . .

4.1.225 *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.

4.1.236 *Characteristics.* A limited obstacle sector shall not subtend an arc greater than 150 degrees. Its dimensions and location shall be as indicated in Figure 4-38 for a 1 D FATO with coincidental TLOF and Figure 4-49 for a 0.83 D TLOF.

4.2 Obstacle limitation requirements

Note 1.— The requirements for obstacle limitation surfaces are specified on the basis of the intended use of a FATO, i.e. approach manoeuvre to hover or landing, or take-off manoeuvre and type of approach, and are intended to be applied when such use is made of the FATO. In cases where operations are conducted to or from both directions of a FATO, then the function of certain surfaces may be nullified because of more stringent requirements of another lower surface.

Note 2.— Guidance on obstacle protection surfaces, for when a visual approach slope indicator (VASI) is installed, is given in the onshore section of the Heliport Manual *(Doc 9261).*

Note 3.— Guidance on obstacle protection surfaces, or operational limitations, when temporary obstacles are present, is given in the Heliport Manual *(Doc 9261).*

~~Surface-level heliports~~ Onshore heliports

Origin:	*Rationale*:
HDWG/14 ADOP/4	As has already been established in Annex 14, Volume II, Chapter 3, the Standards for onshore surface level and elevated heliports are the same. This also applies to Chapter 4 and the standards are provided in a single text.

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 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 For heliports 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 1.— The identified objects may limit the heliport operation.*~~

~~*Note 2.— Annex 6, Part 3, provides procedures that may be useful in determining the extent of obstacle penetration.*~~

4.2.4~~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 an appropriate authority determines that the object will not adversely affect the safety or significantly affect the regularity of operations of helicopters~~.

Note.— Circumstances in which the shielding principle may reasonably be applied are described in the Airport Services Manual *(Doc 9137), Part 6.*

4.2.5~~6~~ **Recommendation.—** *Existing objects above any of the surfaces in 4.2.1 and 4.2.2 should, 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~~.*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Early SARPs for Heliports contained a number of surfaces that included conical and inner horizontal. Previous alleviations for penetration of surfaces may therefore have been considering objects in the conical and inner horizontal surfaces, as well those shielded in the approach and take-off climb surfaces. When the main body of Annex 14, Volume II was restricted to *visual heliports*, the standards for surfaces other than *approach*, *take-off climb*, and *transitional* were removed. This left the three surfaces for which penetrating obstacles would result in a hazard that could only be avoided by raising the slope of the surface (thus removing the hazard from penetration of the surface). Methods have now been provided for elevating surfaces above the obstacle environment and alleviation for the penetration of the type A OLS is no longer necessary. Therefore, aeronautical studies are no longer necessary. Further, future amendments to the airspace requirements such as the introduction of Obstacle Free Surfaces (OFS) and Obstacle Evaluation Surfaces (OES) could render the practice of allowing penetration of the *transitional, approach, and take-off climb* surfaces (without increasing the slope to eliminate them from consideration) unacceptable. It is therefore proposed to remove the alleviations.

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.

4.2.6~~7~~ **Recommendation.** *A* ~~surface-level~~ *heliport* ~~shall~~ *should 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 **Recommendation.** *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.*~~

Note.— See the Heliport Manual *(Doc 9261) for guidance.*

Origin:	*Rationale*:
HDWG/14 ADOP/4	This SARP, as currently provided, appears to imply that a single approach and take-off climb surface is the norm – it is not. It is understood that there are important heliports that are so situated that only a single approach/take-off climb surface can be employed. Mostly, these are at heliports situated at hospitals where the heliport has been assessed by the State as necessary for socioeconomic reasons. However, this imposes operational restrictions on aircraft such as to take off/land under tail wind or downwind conditions, which is not a safe practice. Hence, two approach and take off surfaces are proposed. For these reasons, the original text of the second edition of Annex 14, Volume II, is proposed – but as a Recommendation – along with the original text for separation of the two surfaces by a minimal angle which reflects a standard accepted by major States These two subjects are addressed in the *Heliport Manual* (Doc 9216), Section 4.1.1.9. The deleted text will be put into Appendix B to Chapter 4 of the manual – which will be expanded to provide more guidance on the factors that have to be considered in an aeronautical study.

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 increased if the approach surface is extended to meet the OCS of the PinS arrival 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).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Table 4-1 has been amended to account for the changes in 4.1.2 and 4.1.9.

~~*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.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The subject of this note is now comprehensively addressed in the *Heliport Manual* (Doc 9261). Figures 4-1 to 4-4 and Figure 4-6 and associated notes, have been removed. The figures, together with a comprehensive explanatory text, are now contained in the *Heliport Manual* (Doc 9261).

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 **Recommendation.** — *An elevated 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.*~~

~~*Note. — See the* Heliport Manual *(Doc 9261) for guidance.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	As in Chapter 3, the Standards for onshore surface level and elevated heliports, with a few specific exceptions, are identical. The SARPs have therefore been coalesced to a single text.

Helidecks

4.2.7~~12~~ A helideck shall have an obstacle-free sector.

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

4.2.8~~13~~ There shall be no fixed obstacles within the obstacle-free sector above the obstacle-free surface.

4.2.9~~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~~.)

Note.— Where there is a requirement to position, at sea surface level, one or more offshore support vessel(s) (e.g. a Standby Vessel) essential to the operation of a fixed or floating offshore facility, but located within the proximity of the fixed or floating offshore facility, any offshore support vessel(s) would need to be positioned so as not to compromise the safety of helicopter operations during take-off departure and/or approach to landing.

4.2.105 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 LOS, 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 4-38.)

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 4-38 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).*

4.2.116 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 4-49.)

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 4-49 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

4.2.127 The specifications in 4.2.1520 and 4.2.1722 shall be applicable for shipboard heliports completed on or after 1 January 2012.

Purpose-built heliports located forward or aft

4.2.138 When helicopter operating areas are provided in the bow or stern of a ship they shall apply the obstacle criteria for helidecks.

Amidships location — Purpose-built and non-purpose-built

4.2.149 Forward and aft of a TLOF of 1 D and larger shall be two symmetrically located sectors, each covering an arc of 150 degrees, with their apexes on the periphery of the TLOF. Within the area enclosed by these two sectors, there shall be no objects rising above the level of the TLOF, except those aids essential for the safe operation of a helicopter and then only up to a maximum height of 25 cm.

4.2.2015 Objects whose function requires them to be located within the TLOF (such as lighting or nets) shall not exceed a height of 2.5 cm. Such objects shall only be present if they do not represent a hazard to helicopters.

Note.— Examples of potential hazards include nets or raised fittings on the deck that might induce dynamic rollover for helicopters equipped with skids.

4.2.216 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 4-510.)

Non-purpose-built heliports — Ship's side location

4.2.1722 No objects shall be located within the TLOF except those aids essential for the safe operation of a helicopter (such as nets or lighting) and then only up to a maximum height of 2.5 cm. Such objects shall only be present if they do not represent a hazard to helicopters.

4.2.1823 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 4-611.) Such objects shall only be present if they do not represent a hazard to helicopters.

4.2.1924 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 4.2.1823 and 4.2.1924 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 4.2.1924, particularly if objects are significantly higher than 25 cm and in close proximity to the boundary of the LOS. See the Heliport Manual *(Doc 9261) for guidance.*

Winching areas

4.2.205 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 4-712.)

4.2.216 The manoeuvring zone shall be comprised of two areas:

a) the inner manoeuvring zone extending from the perimeter of the clear zone and of a circle of diameter not less than 1.5 D; and

b) the outer manoeuvring zone extending from the perimeter of the inner manoeuvring zone and of a circle of diameter not less than 2 D.S

4.2.227 Within the clear zone of a designated winching area, no objects shall be located above the level of its surface.

4.2.238 Objects located within the inner manoeuvring zone of a designated winching area shall not exceed a height of 3 m.

4.2.249 Objects located within the outer manoeuvring zone of a designated winching area shall not exceed a height of 6 m.

Note.— See the Heliport Manual *(Doc 9261) for guidance.*

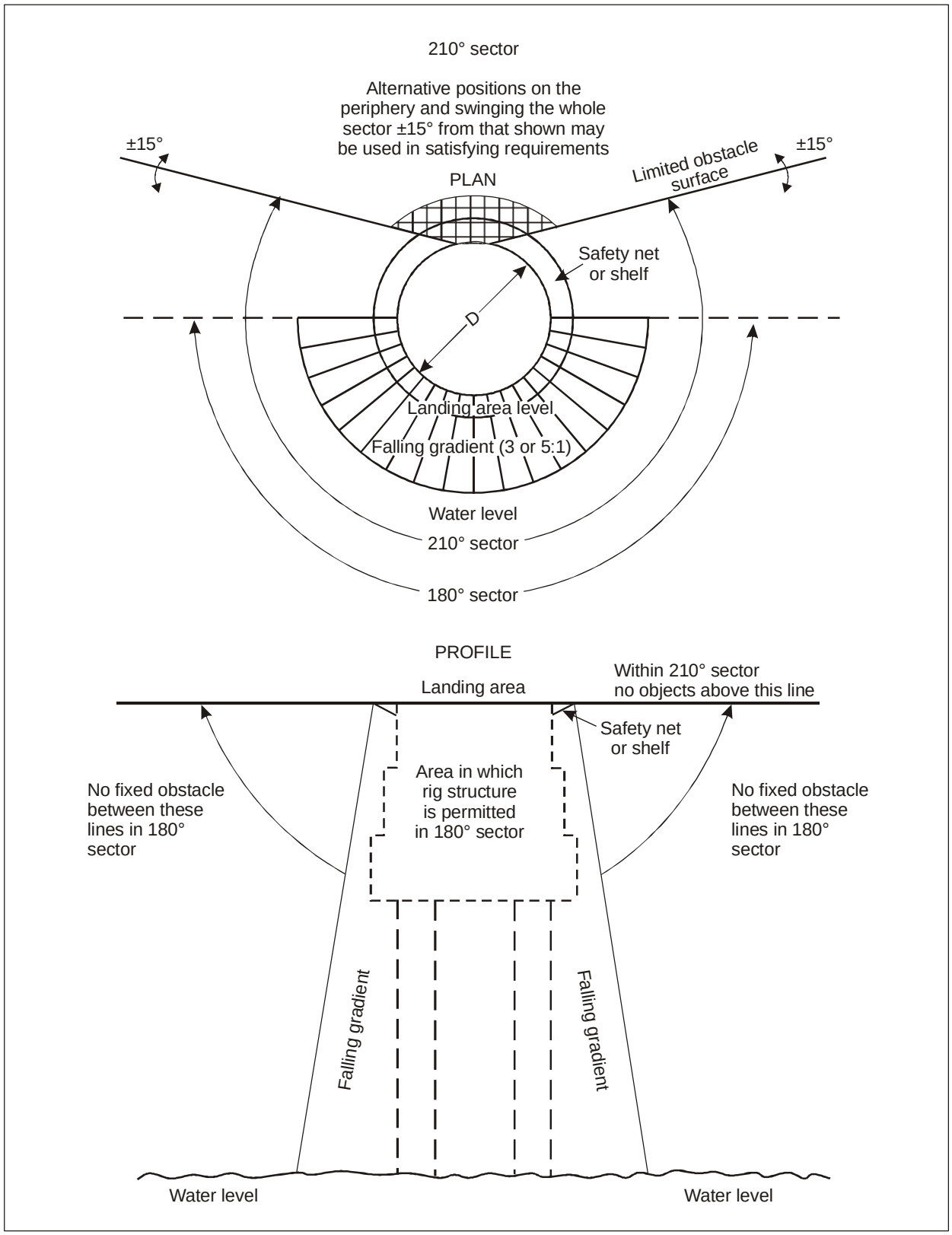


Figure 4-27. Helideck obstacle-free sector

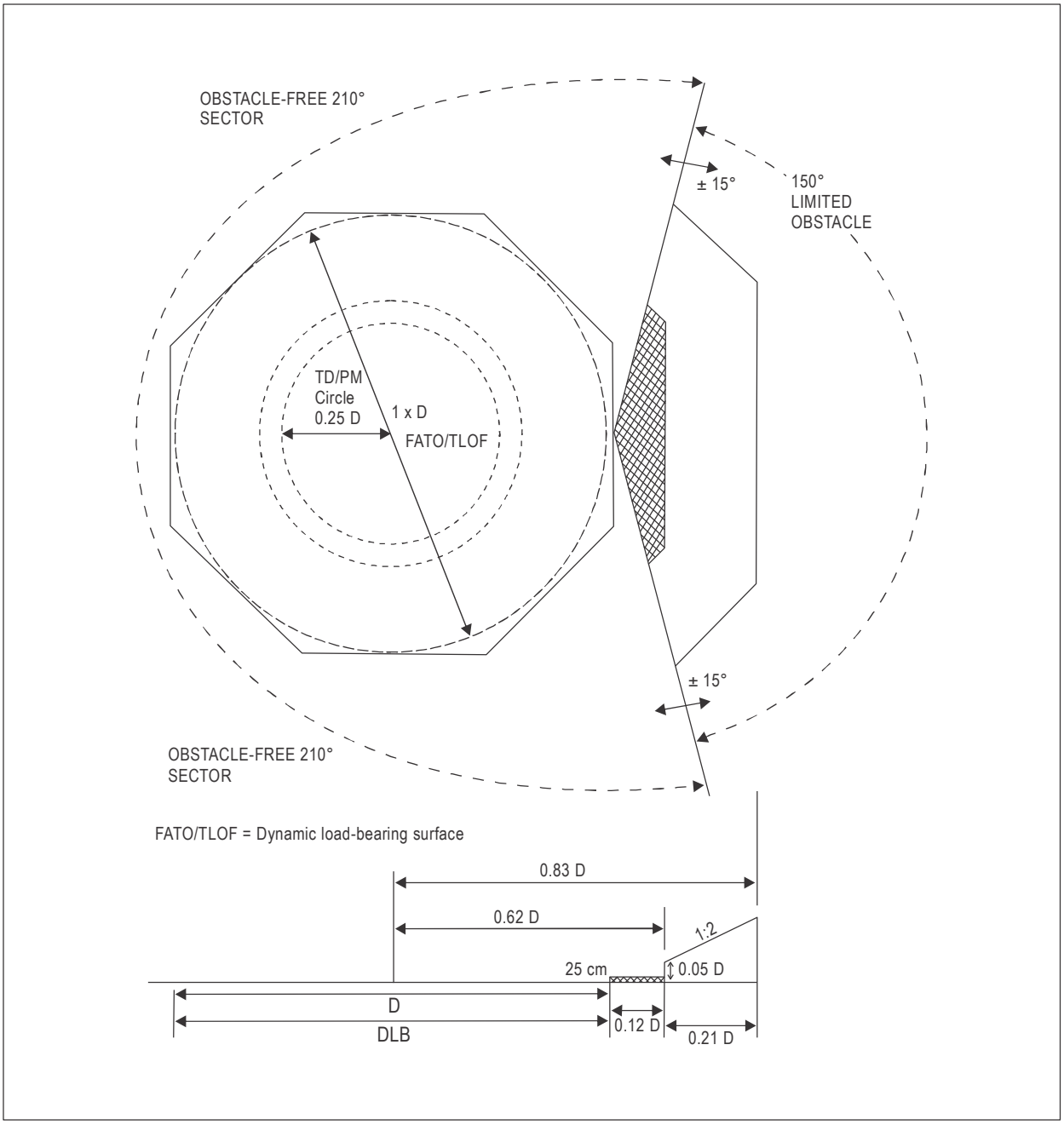
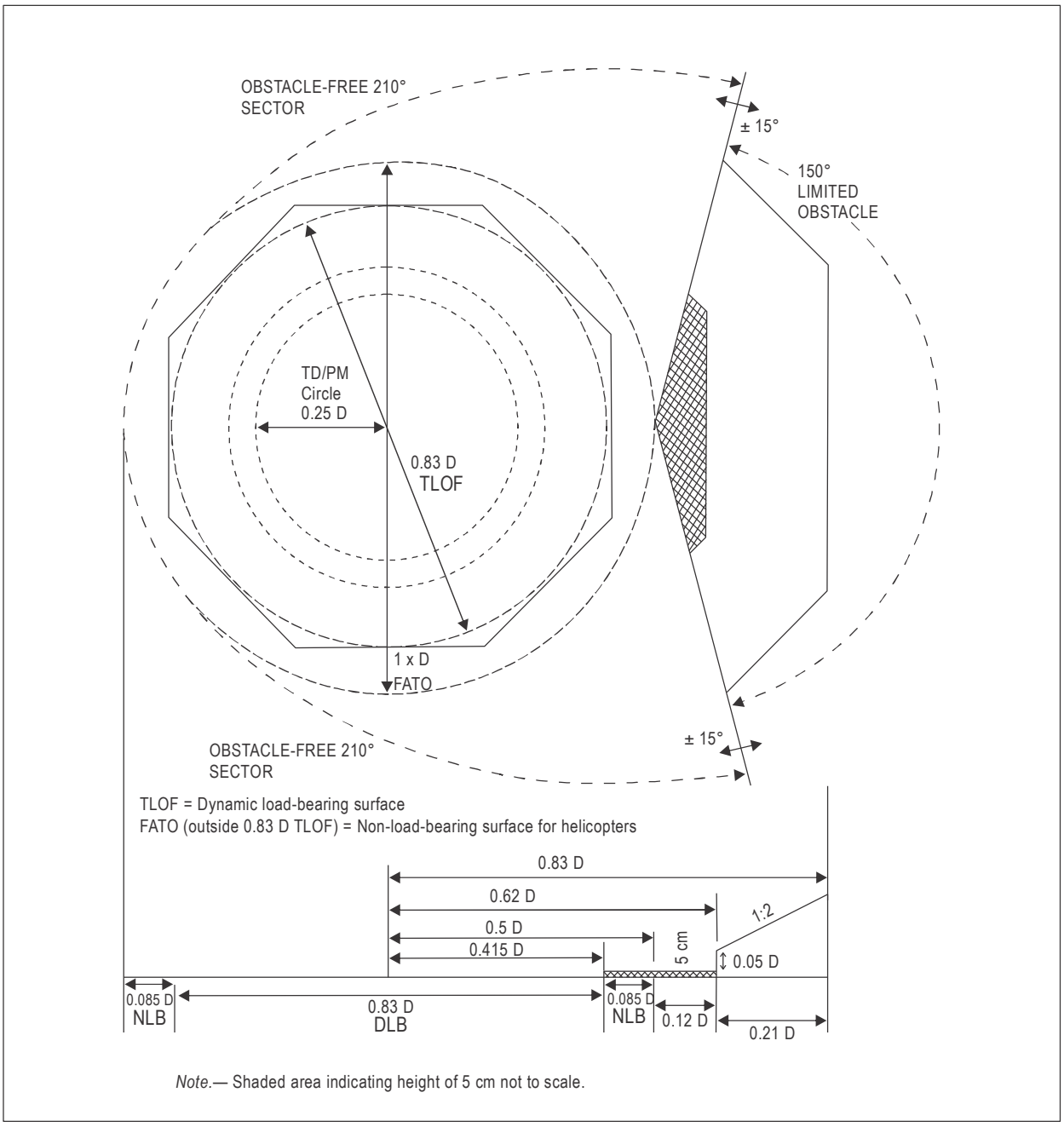


Figure 4-38. Helideck obstacle limitation sectors and surfaces for a FATO and coincidental TLOF of 1 D and larger



Note.— Shaded area indicating height of 5 cm not to scale.

Figure 4-49. Helideck obstacle limitation sectors and surfaces for a TLOF of 0.83 D and larger

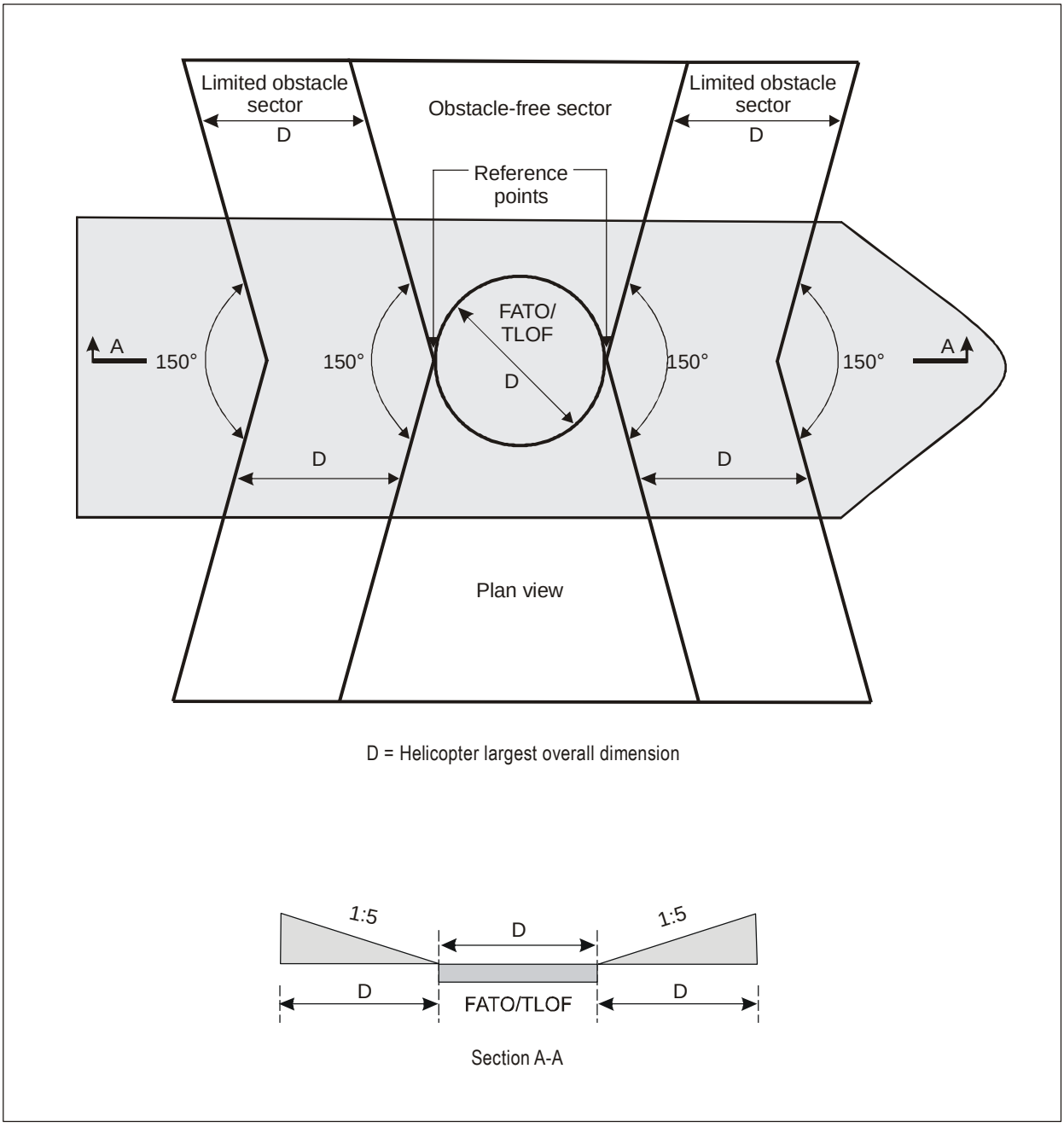


Figure 4-5~~10~~. Amidship's location — shipboard heliport obstacle limitation surfaces

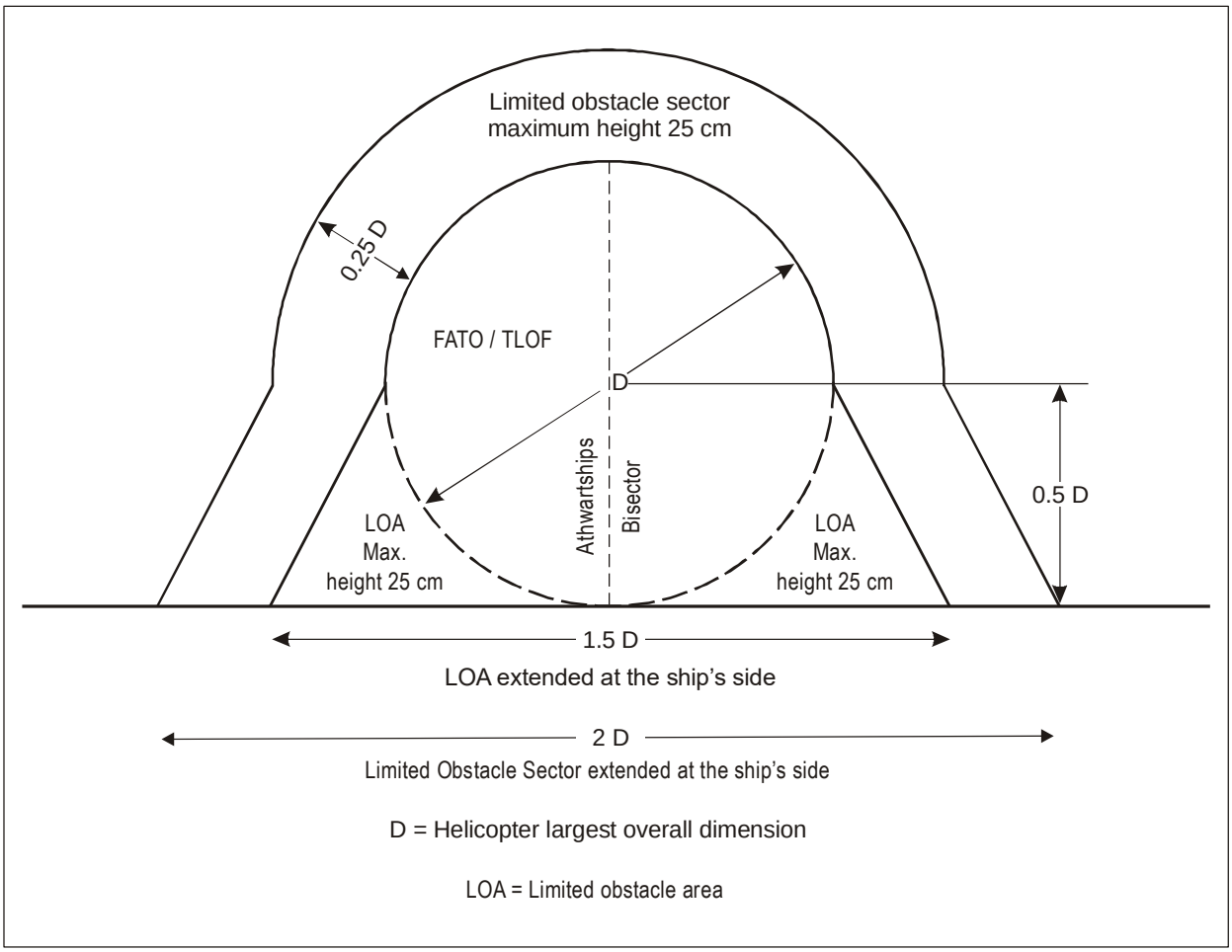


Figure 4-~~611~~. Ships-side non-purpose-built heliport obstacle limitation sectors and surfaces

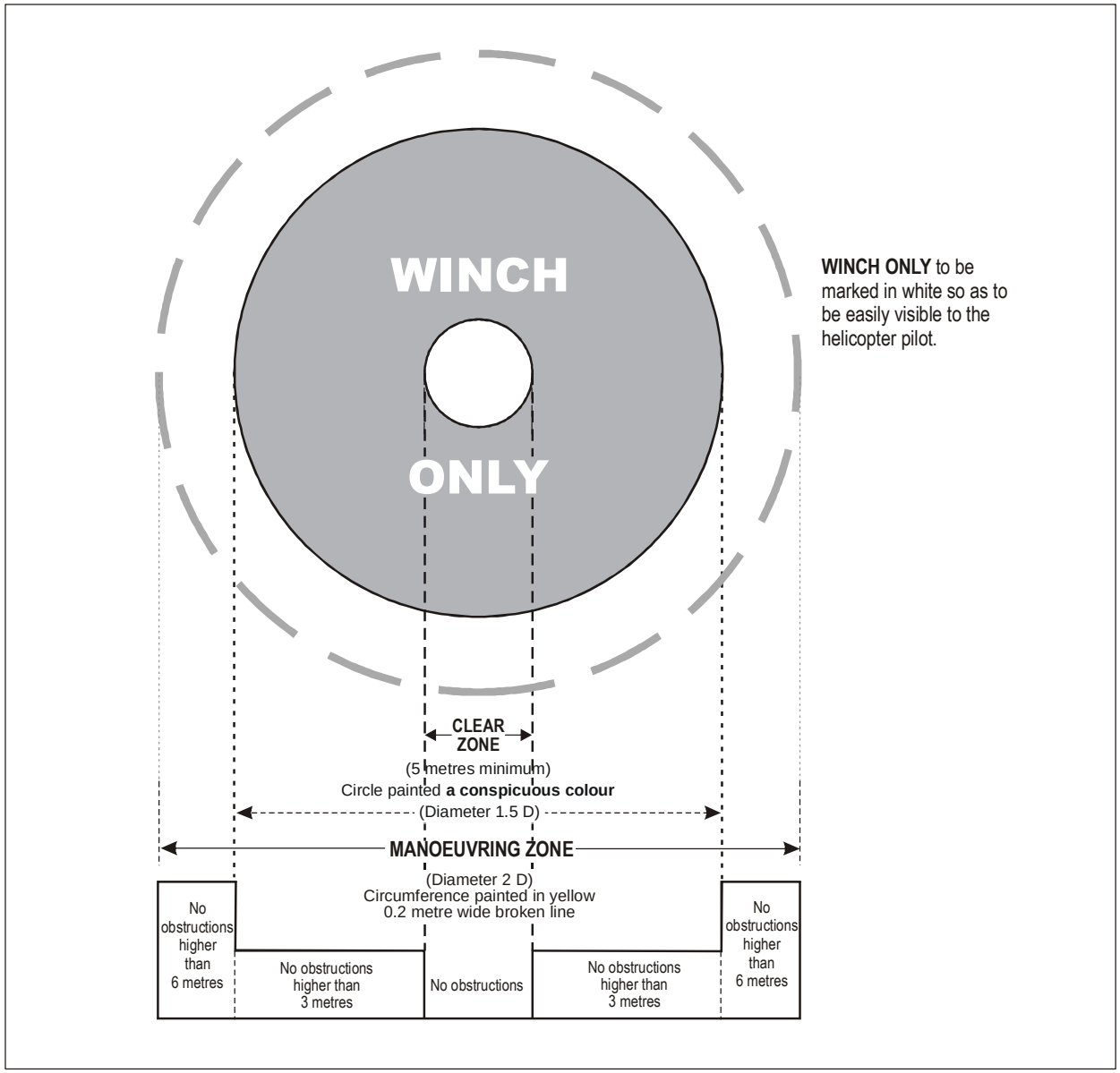


Figure 4-7~~12~~. Winching area of a ship

INITIAL PROPOSAL 4
Visual aids for heliports

CHAPTER 5. VISUAL AIDS

. . .

5.2 Markings and markers

Note.— See Annex 14, Volume I, 5.2.1.4, Note 1, concerning improving conspicuity of markings.

. . .

5.2.14 Helicopter air taxi-route markings and markers

. . .

Location

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

Characteristics

5.2.14.3 A helicopter air taxi-route centre line, when on a paved surface, shall be marked with a continuous yellow line 15 cm in width.

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.

Note.— Further guidance on the characteristics of markers is provided in the Heliport Manual *(Doc 9261).*

5.2.14.5 If the helicopter air taxi-route is to be used at night, markers shall be either internally illuminated or retro-reflective.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The proposed amendment to Annex 14, Section 5.2.14 and consequential amendment to Doc 9261, Section 5.2.11, removes a discontinuity that resulted from the revision of the fourth edition of the Annex. This discontinuity resulted from the requirement to link air taxi-routes with taxiways and the subsequent replacement of three-dimensional markers by flush in-ground markers on unpaved surfaces. The fifth edition of the Annex for taxiways introduced flexibility by allowing both implementations (i.e. an air taxi-route with, or without, collocation with a taxiway). The amended text of the Annex provides an objective which can be met by either two or three-dimensional markers and points to Doc 9261 for guidance on methods of compliance. The subsequent revision of Doc 9261 will provide the guidance for both implementations.

. . .

5.3 Lights

5.3.1 General

. . .

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 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.~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note highlights that not all lighting technologies are visible when using Night Vision Imaging Systems (NVIS). The note has been expanded to provide a means to ensure the compatibility of NVIS with heliport lighting.

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. Guidance on a suitable heliport beacon is given in the Heliport Manual *(Doc 9261).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note sets the objective for a heliport beacon which is required to help a pilot locate and identify the heliport during reduced visibility conditions.

Application

5.3.2.1 **Recommendation.—** *A heliport beacon should be provided at a heliport where:*

a) long-range visual guidance is considered necessary and is not provided by other visual means; or

b) identification of the heliport is difficult due to surrounding lights.

~~***Location***~~

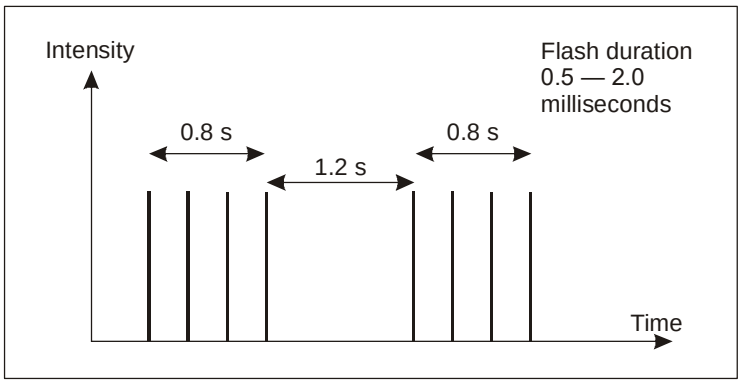
~~5.3.2.2 The heliport beacon shall be located on or adjacent to the heliport preferably at an elevated position and so that it does not dazzle a pilot at short range.~~

~~*Note.— Where a heliport beacon is likely to dazzle pilots at short range, it may be switched off during the final stages of the approach and landing.*~~

~~***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.~~

~~5.3.2.4 The light from the beacon shall show at all angles of azimuth.~~



~~Figure 5-11. Heliport beacon flash characteristics~~

~~5.3.2.5 **Recommendation.—** *The effective light intensity distribution of each flash should be as shown in Figure 5-12, Illustration 1.*~~

~~*Note.— Where brilliancy control is desired, settings of 10 per cent and 3 per cent have been found to be satisfactory. In addition, shielding may be necessary to ensure that pilots are not dazzled during the final stages of the approach and landing.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The detailed specification for heliport beacons is transferred to the *Heliport Manual* (Doc 9261) to allow operators some flexibility on the systems that they may (optionally) provide.

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. Guidance on suitable approach lighting systems is given in the Heliport Manual *(Doc 9261).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note sets the objective for approach light systems which are required to help a pilot locate and align the helicopter on the centreline of the FATO while on the approach flight path.

Application

5.3.3.1 **Recommendation.—** *An approach lighting system should be provided at a heliport where it is desirable and practicable to indicate a preferred approach direction.*

~~Location~~

~~5.3.3.2 The approach lighting system shall be located in a straight line along the preferred direction of approach.~~

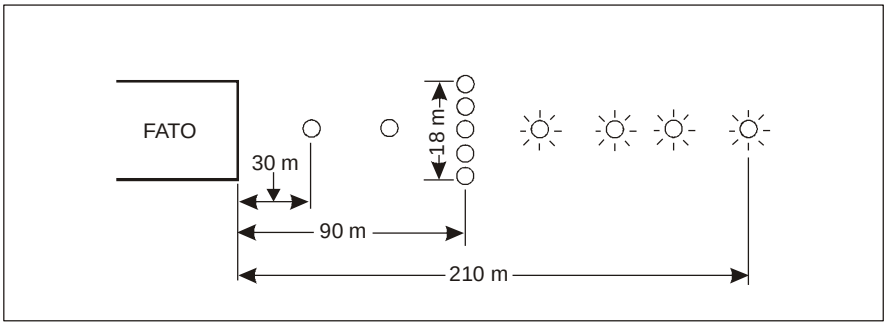
~~Characteristics~~

~~5.3.3.3 **Recommendation.** *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 as shown in Figure 5-13. 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. Where there is the 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.*~~

~~*Note. — Sequenced flashing lights may be useful where identification of the approach lighting system is difficult due to surrounding lights.*~~

~~5.3.3.4 The steady lights shall be omnidirectional white lights.~~

~~5.3.3.5 Sequenced flashing lights shall be omnidirectional white lights.~~



~~**Figure 5-13. Approach lighting system**~~

~~5.3.3.6 **Recommendation.** *The flashing lights should have a flash frequency of one per second and their light distribution should be as shown in Figure 5-12, Illustration 3. The flash sequence should commence from the outermost light and progress towards the crossbar.*~~

~~5.3.3.7 **Recommendation.** *A suitable brilliancy control should be incorporated to allow for adjustment of light intensity to meet the prevailing conditions.*~~

~~*Note. — The following intensity settings have been found suitable:*~~

~~*a) steady lights — 100 per cent, 30 per cent and 10 per cent; and*~~

~~*b) flashing lights — 100 per cent, 10 per cent and 3 per cent.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	The detailed specification for approach lighting systems is transferred to the *Heliport Manual* (Doc 9261) to allow operators some flexibility on the systems that they may (optionally) provide.

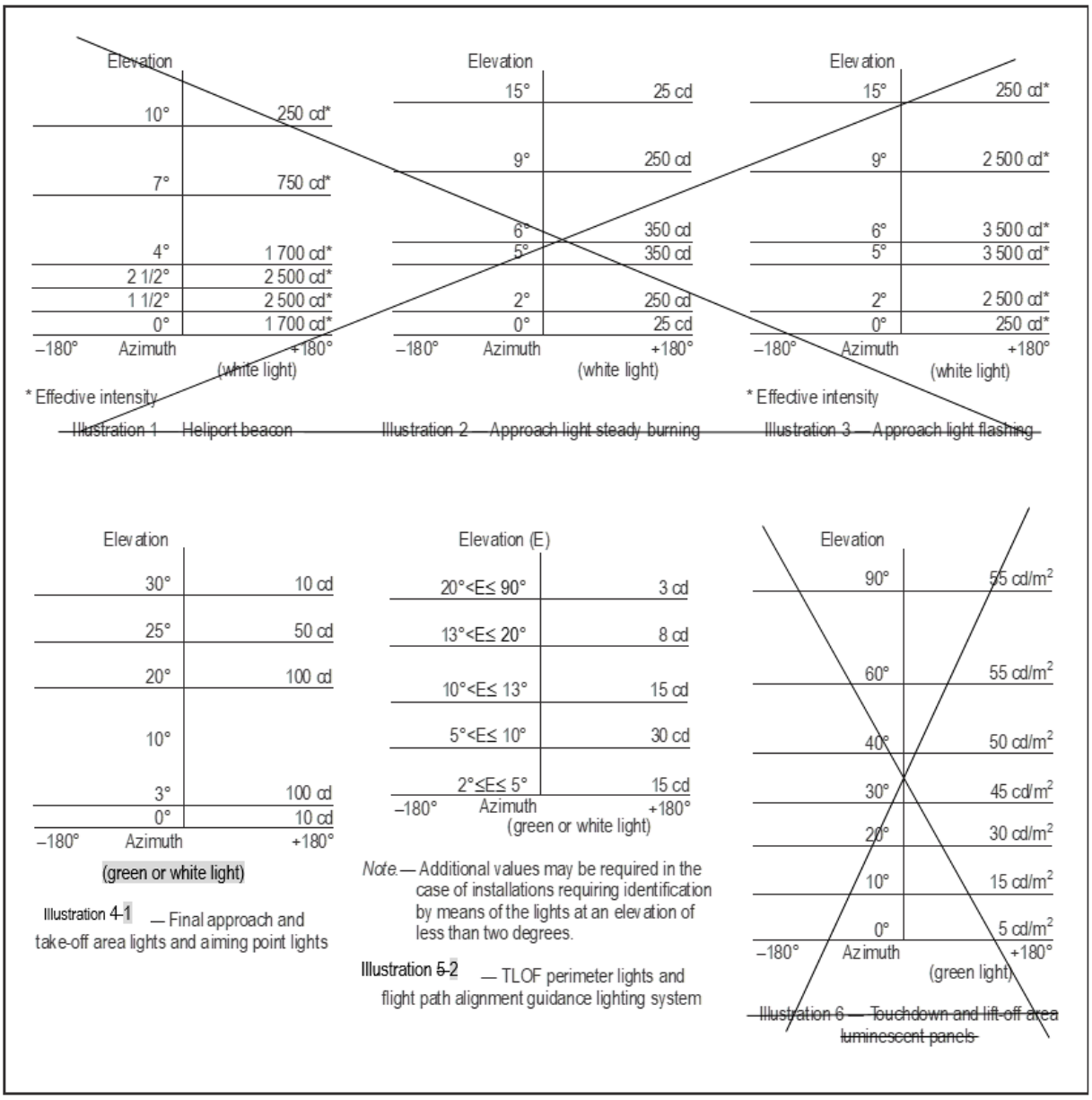


Figure 5-~~12~~11. Isocandela diagrams

"(green or white light)"

Origin: HDWG/14 ADOP/4	*Rationale*: Update to provide both green or white colour options for FATO lights. The detailed specifications for Heliport Beacon, approach lighting systems and related illustrations one to three and six, are transferred to the *Heliport Manual* (Doc 9261).

5.3.4 Flight path alignment guidance lighting system

Note.— The objective of a flight path alignment guidance lighting system is to indicate, by day, night, and in reduced visibility, available approach and/or departure flight path direction(s).

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note sets the objective for a flight path guidance lighting system which is required to indicate available approach and/or departure path directions.

Application

5.3.4.1 **Recommendation.—** *Flight path alignment guidance lighting system(s) should be provided at a heliport where it is desirable and practicable to indicate available approach and/or departure path direction(s).*

. . .

Characteristics

5.3.4.4 **Recommendation.—** *A flight path alignment guidance lighting system should consist of a row of three or more lights spaced uniformly with a total minimum distance of 6 m. Intervals between lights should not be less than 1.5 m and should not exceed 3 m. Where space permits, there should be 5 lights. (See Figure 5-10.)*

Note.— The number of lights and spacing between these lights may be adjusted to reflect the space available. If more than one flight path alignment system is used to indicate available approach and/or departure path direction(s), the characteristics for each system are typically kept the same. (See Figure 5-10.)

5.3.4.5 The lights shall be steady omnidirectional inset white lights.

5.3.4.6 **Recommendation.—** *The distribution of the lights should be as indicated in Figure 5-1~~2~~1, Illustration ~~5~~2.*

5.3.4.7 **Recommendation.—** *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.*

5.3.5 Visual alignment guidance system

. . .

5.3.7 FATO ~~lighting systems~~ perimeter lights for onshore surface-level heliports

Note.— The objective of ~~a~~ FATO ~~lighting system~~ 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.

Location

5.3.7.2 FATO perimeter lights shall be placed along the edges of the FATO. The lights shall be uniformly spaced as follows:

a) 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

b) for any other shaped area, including a circular area, at intervals of not more than 5 m with a minimum of ten lights.

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.~~

Note.— Further guidance on colour selection of FATO perimeter lights is provided in the Heliport Manual *(Doc 9261).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Specification was updated to provide options for green or white colour FATO lights. Further guidance and context on applicability is being provided in the *Heliport Manual* (Doc 9261).

5.3.7.4 **Recommendation.—** *The light distribution of FATO perimeter lights should be as shown in Figure 5-1~~2~~-1 Illustration 1-~~4~~.*

. . .

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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	The specification was updated to display the lights arranged in a standard pattern which pilots can easily recognize.

5.3.8.4 **Recommendation.—** *The light distribution of aiming point lights should be as shown in Figure 5-1~~2~~1, Illustration 1-~~4~~.*

5.3.9 TLOF lighting system

Note.— The objective of a TLOF lighting system is to provide illumination of the TLOF and required elements within. For a TLOF located in a FATO, the objective is to provide discernibility to the pilot, on a final approach, of the TLOF and required elements within; while for a TLOF located on an elevated heliport, shipboard heliport or helideck, the objective is visual acquisition from a defined range and to provide sufficient shape cues to permit an appropriate approach angle to be established.

Application

5.3.9.1 A TLOF lighting system shall be provided at a heliport intended for use at night.

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 ~~one or more~~ either of the following:

a) perimeter lights; or

~~b) floodlighting;~~

~~c~~b) 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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	Floodlighting has been shown to not be a viable option for lighting the TLOF perimeter of a surface level heliport.

5.3.9.3 For an elevated heliport, shipboard heliport or helideck, lighting for 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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	Updated to Touchdown/positioning circle. See Abbreviations section and Figure 5-8 (left).

Note.— ~~At elevated heliports, shipboard heliports and helidecks, 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 n (LEDs) and inset lights to identify the TDPM and heliport identification markings~~ Guidance on suitable systems is contained in the Heliport Manual *(Doc 9261).*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Note is deleted as guidance on practicable systems is now provided in the *Heliport Manual* (Doc 9261).

5.3.9.4 **Recommendation.—** *When enhanced surface texture cues are required at a TLOF ASPSL and/or LPs to identify the TDPCM ~~and/or floodlighting should 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.~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	Guidance on this issue is now contained in the *Heliport Manual* (Doc 9261). As related subject matter the first sentence of 5.3.9.6 is relocated to 5.3.9.5. Shipboard heliports are added.

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).*

5.3.9.6~~7~~ The TLOF perimeter lights shall be installed at an elevated heliport or fixed helideck such that the pattern cannot be seen by the pilot from below the elevation of the TLOF.

5.3.9.7~~8~~ The TLOF perimeter lights shall be installed on a moving helideck or shipboard heliport such that the pattern cannot be seen by the pilot from below the elevation of the TLOF when the helideck or shipboard heliport is level.

~~5.3.9.9 On surface-level heliports, ASPSL or LPs, if provided to identify the TLOF, shall be placed along the marking designating the edge of the TLOF. Where the TLOF is a circle, they shall be located on straight lines circumscribing the area.~~

~~5.3.9.10 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.~~

~~5.3.9.11 **Recommendation.** *When LPs are used on an elevated heliport or helideck to enhance surface texture cues, the panels should not be placed adjacent to the perimeter lights. They should be placed around a TDPM or coincident with heliport identification marking.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	Guidance on these issues is now contained in the *Heliport Manual* (Doc 9261).

5.3.9.8~~12~~ TLOF floodlights 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.*~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note is deleted as guidance on practicable systems is now provided in the *Heliport Manual* (Doc 9261).

Characteristics

5.3.9.9~~13~~ The TLOF perimeter lights shall be fixed omnidirectional lights showing green.

5.3.9.10~~4~~ At a surface-level heliport, ASPSL or LPs shall emit green light when used to define the perimeter of the TLOF.

~~5.3.9.15 **Recommendation.** *The chromaticity and luminance of colours of LPs should conform to Annex 14, Volume I, Appendix 1, 3.4.*~~

~~5.3.9.16 An LP shall have a minimum width of 6 cm. The panel housing shall be the same colour as the marking it defines.~~

Origin:	*Rationale*:
HDWG/14 ADOP/4	Guidance on this issue is contained in the *Heliport Manual* (Doc 9261).

5.3.9.11~~7~~ For a surface-level or elevated heliport, the TLOF perimeter lights located in a FATO shall not exceed a height of 5 cm and shall be inset when a light extending above the surface could endanger helicopter operations.

5.3.9.12~~8~~ For a helideck or shipboard heliport, the TLOF perimeter lights shall not exceed a height of 5 cm, or for a FATO/TLOF, 15 cm.

5.3.9.13~~9~~ **Recommendation.—** *When located within the safety area of a surface-level or elevated heliport, the TLOF floodlights should not exceed a height of 25 cm.*

5.3.9.1420 For a helideck or shipboard heliport, the TLOF floodlights shall not exceed a height of 5 cm, or for a FATO/TLOF, 15 cm.

5.3.9.1521 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).*

5.3.9.1622 **Recommendation —** *The light distribution of the perimeter lights should be as shown in Figure 5-121, Illustration 25.*

5.3.9.23.**Recommendation** *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). should be as shown in Figure 5-12, Illustration 6.*

Origin:	*Rationale*:
HDWG/14 ADOP/4	Illustration was migrated to the *Heliport Manual* (Doc 9261).

5.3.9.1724 The spectral distribution of TLOF floodlights shall be such that the surface and obstacle markings can be correctly identified.

5.3.9.25 **Recommendation.** *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.*

5.3.9.26 **Recommendation.** — Lighting used to identify the TDPC 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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	Recommendation 5.3.9.25 is deleted given that the required average horizontal illuminance has been shown to be very difficult to measure and verify. Recommendation 5.3.9.26 is deleted given that there is now detailed guidance in the *Heliport Manual* (Doc 9261) on precisely where these are located within the circle.

5.3.9.1827 **Recommendation.—** *If utilized, the heliport identification marking lighting, or cross marking lighting at a hospital, should be omnidirectional showing green.*

Origin:	*Rationale*:
HDWG/14 ADOP/4	This recommendation has been expanded to include a specification for the use of cross marking lighting at a hospital, as detailed in the *Heliport Manual* (Doc 9261).

5.3.10 Helicopter stand floodlighting

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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.

Origin:	*Rationale*:
HDWG/14 ADOP/4	This note sets the objective for obstacle floodlighting which is required to help a pilot safely identify and avoid obstacles in the vicinity of the heliport during operations at night.

Application

5.3.14.1 At a heliport intended for use at night, obstacles shall be floodlighted if it is not possible to display obstacle lights on them.

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ATTACHMENT B to State letter AN 4/1.1.58-23/32

RESPONSE FORM TO BE COMPLETED AND RETURNED TO ICAO TOGETHER WITH ANY COMMENTS YOU MAY HAVE ON THE PROPOSED AMENDMENTS

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Quebec
Canada, H3C 5H7

(State) _____

Please make a checkmark (✓) against one option for each amendment. If you choose options "agreement with comments" or "disagreement with comments", **please provide your comments on separate sheets**.

	Agreement without comments	*Agreement with comments**	*Disagreement without comments*	*Disagreement with comments*	*No position*
Amendment to Annex 14 — *Aerodromes*, Volume II — *Heliports* (Attachment A refers)					

*"Agreement with comments" indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature: _____ Date: _____

— END —