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) 954-6717

Ref.: AN 4/16.6-09/31

9 April 2009

Subject: Adoption of Amendment 4 to Annex 14 Volume II

Action Required: a) Notify any disapproval before 20 July 2009; b) Notify any differences and compliance before 19 October 2009.

Sir/Madam,

1. I have the honour to inform you that Amendment 4 to *Aerodromes — Heliports* (Annex 14, Volume II to the Convention on International Civil Aviation) was adopted by the Council at the sixth meeting of its 186th Session on 4 March 2009. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (www.icao.int/icaonet).

2. When adopting the amendment, the Council prescribed 20 July 2009 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 4, to the extent it becomes effective, will become applicable on 19 November 2009.

3. Amendment 4 arises from recommendations of the first meeting of the Aerodromes Panel (AP/1).

4. The proposed amendment is aimed at enhancing heliport safety and efficiency. It covers definitions, applicability, physical characteristics for surface level heliports, elevated heliports, helidecks and shipboard heliports, obstacle limitation surfaces and sectors and requirements for helidecks and shipboard heliports and visual aids for heliports.

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5. In accordance with the decision of the 26th Session of the Assembly, I would like to bring to your attention the Organization's long-standing practice of providing documentation to States upon request. In this regard, I wish to refer you to the ICAO-NET website (www.icao.int/icaonet) where you can access all relevant documentation. The practice of dispatching printed copies of such documentation has now been discontinued.

6. In conformity with the Resolution of Adoption, may I request:

a) that before 20 July 2009 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 4, concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment;

b) that before 19 October 2009 you inform me of the following, using the form in Attachment C for this purpose:

1) any differences that will exist on 19 November 2009 between the national regulations or practices of your Government and the provisions of the whole of Annex 14, Volume II, as amended by all amendments up to and including Amendment 4, and thereafter of any further differences that may arise;

2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 14, Volume II, as amended by all amendments up to and including Amendment 4.

7. With reference to the request in paragraph 6 a) above, it should be noted that a registration of disapproval of Amendment 4 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 6 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

8. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D.

9. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

10. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 6b) above, to the ICAO Regional Director accredited to your Government.

11. As soon as practicable after the amendment becomes effective, on 20 July 2009, replacement pages incorporating Amendment 4 will be forwarded to you.

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

Taïeb Chérif
Secretary General

Enclosures:

A — Amendment to the Foreword of Annex 14 Volume II
B — Form on notification of disapproval of all or part of Amendment 4 to Annex 14 Volume II
C — Form on notification of compliance with or differences from Annex 14 Volume II
D — Note on the Notification of Differences

ATTACHMENT A to State letter AN 4/16.6-09/31

AMENDMENT TO THE FOREWORD OF ANNEX 14, VOLUME II, SECOND EDITION

Add the following at the end of Table A:

Amendment	***Source(s)***	***Subject***	***Adopted/Approved Effective Applicable***
4	First meeting of the Aerodromes Panel	Introductory note; definitions of air transit route, declared distances, dynamic load bearing surface, final approach and take-off area, helicopter air taxiway, helicopter clearway, helicopter ground taxiway, helicopter stand, helideck, obstacle, protection area, rejected take-off area, shipboard heliport, static load-bearing surface, taxi-route, touchdown and lift-off area, winching area; applicability; physical characteristics for surface-level heliports, elevated heliports, helidecks, and shipboard heliports; obstacle limitation surfaces and sectors and requirements for helidecks and shipboard heliports; winching area marking; heliport identification marking; maximum allowable mass marking; maximum allowable D-value marking; touchdown and lift-off area marking; touchdown/positioning marking; helideck obstacle-free sector marking; helideck surface marking; and helideck prohibited landing sector marking.	4 March 2009 20 July 2009 19 November 2009

— — — — — — — — —

ATTACHMENT B to State letter AN 4/16.6-09/31

NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF AMENDMENT 4 TO ANNEX 14, VOLUME II

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

(State) ———————————————— hereby wishes to disapprove the following parts of Amendment 4 to Annex 14, Volume II:

Signature ————————————————

Date ————————————

NOTES

1) If you wish to disapprove all or part of Amendment 4 to Annex 14, Volume II, please dispatch this notification of disapproval to reach ICAO Headquarters by 20 July 2009. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 4, it is not necessary to return this notification of disapproval.**

2) This notification should not be considered a notification of compliance with or differences from Annex 14, Volume II. Separate notifications on this are necessary. (See Attachment C.)

3) Please use extra sheets as required.

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ATTACHMENT C to State letter AN 4/16.6-09/31

NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM ANNEX 14, VOLUME II (including all amendments up to and including Amendment 4)

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

1. No differences will exist on ———— between the national regulations and/or practices of **(State)** ———— and the provisions of Annex 14, Volume II, including all amendments up to and including Amendment 4.

2. The following differences will exist on ———— between the regulations and/or practices of **(State)** ———— and the provisions of Annex 14, Volume II, including Amendment 4 (Please see Note 3) below.)

a) **Annex Provision** (Please give exact paragraph reference)	b) **Difference Category** (Please indicate A, B, or C)	c) **Details of Difference** (Please describe the difference clearly and concisely)	d) **Remarks** (Please indicate reasons for the difference)

(Please use extra sheets as required)

3. By the dates indicated below, **(State)** ———————————————— will have complied with the provisions of Annex 14, Volume II, including all amendments up to and including Amendment 4 for which differences have been notified in 2 above.

a) **Annex Provision** (Please give exact paragraph reference)	**b)** **Date**	**c)** **Comments**

(Please use extra sheets as required)

Signature ————————————————

Date ————————————

NOTES

1) If paragraph 1 above is applicable to you, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.

2) Please dispatch the form to reach ICAO Headquarters by 19 October 2009.

3) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

4) Guidance on the notification of differences from Annex 14, Volume II is provided in the Note on the Notification of Differences at Attachment D.

5) Please send a copy of this notification to the ICAO Regional Director accredited to your Government.

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ATTACHMENT D to State letter AN 4/16.6-09/31

NOTE ON THE NOTIFICATION OF DIFFERENCES TO ANNEX 14, VOLUME II AND FORM OF NOTIFICATION

(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 The Assembly and the Council, when reviewing the notification of differences by States in compliance with Article 38 of the Convention, have repeatedly noted that the state of such reporting is not entirely satisfactory.

1.2 With a view to achieving a more comprehensive coverage, this note is issued to facilitate the determination and reporting of such differences and to state the primary purpose of such reporting.

1.3 The primary purpose of reporting of differences is to promote safety and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the ICAO Standards.

1.4 Contracting States are, therefore, requested to give particular attention to the notification before 19 October 2009 of differences with respect to Standards in Annex 14, Volume II. The Council has also urged Contracting States to extend the above considerations to Recommended Practices.

1.5 Contracting States are asked to note further that it is necessary to make an explicit statement of intent to comply where such intent exists, or where such is not the intent, of the difference or differences that will exist. This statement should be made not only to the latest amendment but to the whole Annex, including the amendment.

1.6 If previous notifications have been made in respect of this Annex, detailed repetition may be avoided, if appropriate, by stating the current validity of the earlier notification. States are requested to provide updates of the differences previously notified after each amendment, as appropriate, until the difference no longer exists.

2. *Notification of differences to Annex 14, Volume II including Amendment 4*

2.1 Past experience has indicated that the reporting of differences to Annex 14, Volume II has in some instances been too extensive since some appear merely to be a different manner of expressing the same intent.

2.2 Guidance to Contracting States in the reporting of differences to Annex 14, Volume II can only be given in very general terms. Where the national regulations of States call for compliance with procedures that are not identical but essentially similar to those contained in the Annex, no difference should be reported since the details of the procedures existing are the subject of notification through the medium of aeronautical information publications. Although differences to Recommended Practices are not notifiable under Article 38 of the Convention, Contracting States are urged to notify the Organization of the differences between their national regulations and practices and any corresponding Recommended Practices contained in an Annex. States should categorize each difference notified on the basis of whether the corresponding national regulation is:

a) ***More exacting or exceeds the ICAO Standard or Recommended Practice (SARP) (Category A)***. This category applies when the national regulation is more demanding than the corresponding SARP, or imposes an obligation within the scope of the Annex which is not covered by a SARP. This is of particular importance where a State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

b) ***Different in character or other means of compliance (Category B)****. This category applies when the national regulation is different in character from the corresponding ICAO SARP, or when the national regulation differs in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and

c) ***Less protective or partially implemented/not implemented (Category C)***. This category applies when the national regulation is less protective than the corresponding SARP; or when no national regulation has been promulgated to address the corresponding SARP, in whole or in part.

2.3 When a Contracting State deems an ICAO Standard concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences to Annex 8 provisions related to the design and construction of an aircraft.

2.4 For States that have already fully reported differences from Annex 14, Volume II or have reported that no differences exist, the reporting of any further differences occasioned by the amendment should be relatively straightforward; however, attention is called to paragraph 1.5 wherein it is indicated that this statement should be not only to the latest amendment but to the whole Annex, including the amendment.

3. *Form of notification of differences*

3.1 Differences should be notified in the following form:

a) *Reference*: The number of the paragraph or subparagraph in Annex 14, Volume II as amended which contains the Standard or Recommended Practice to which the difference relates;

b) *Category*: Indicate the category of the difference as A, B or C in accordance with paragraph 2.2 above.

c) *Description of the difference*: Clearly and concisely describe the difference and its effect;

d) *Remarks*: Under “Remarks” indicate reasons for the difference and intentions including any planned date for implementation.

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*The expression “different in character or other means of compliance” in b) would be applied to a national regulation which achieves, by other means, the same objective as that of the corresponding ICAO SARPs and so cannot be classified under a) or c).

3.2 The differences notified will be recorded in a Supplement to the Annex, normally in the terms used by the Contracting State when making the notification. In the interest of making the supplement as useful as possible, please make statements as clear and concise as possible and confine remarks to essential points. Comments on implementation, in accordance with paragraph 4 b) 2) of the Resolution of Adoption, should not be combined with those concerning differences. The provision of extracts from national regulations cannot be considered as sufficient to satisfy the obligation to notify differences. General comments that do not relate to specific differences will not be published in Supplements.

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AMENDMENT No. 4

TO THE

INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES

AERODROMES

ANNEX 14

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME II
HELIPORTS

The amendment to Annex 14, Volume II, contained in this document was adopted by the Council of ICAO on **4 March 2009**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **20 July 2009** will become effective on that date and will become applicable on **19 November 2009** as specified in the Resolution of Adoption. (State letter AN 4/16.6-09/31 refers.)

MARCH 2009

INTERNATIONAL CIVIL AVIATION ORGANIZATION

AMENDMENT 4 TO THE INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

ANNEX 14, VOLUME II

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 4 March 2009 Amendment 4 to Annex 14, Volume II to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Heliports* which for convenience is designated Annex 14 to the Convention;

2. *Prescribes* 20 July 2009 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;

3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 19 November 2009;

4. *Requests the Secretary General*:

a) to notify each Contracting State immediately of the above action and immediately after 20 July 2009 of those parts of the amendment which have become effective;

b) to request each Contracting State:

1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 19 November 2009 between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 19 October 2009, and thereafter to notify the Organization of any further differences that arise;

2) to notify the Organization before 19 October 2009 of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended.

c) to request each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, when the notification of such differences is important for the safety of air navigation, following the procedure specified in subparagraph b) above with respect to differences from Standards.

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT TO ANNEX 14, VOLUME II

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

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

TEXT OF AMENDMENT 4 TO THE

INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES

HELIPORTS

ANNEX 14, VOLUME II
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

CHAPTER 1. GENERAL

Introductory Note.— Annex 14, Volume II ~~of this Annex~~ 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.

When designing a heliport, the critical design helicopter, having the largest set of dimensions and the greatest maximum take-off mass (MTOM) the heliport is intended to serve, would need to be considered.

~~The specifications in this volume modify or complement those in Volume I which, where appropriate, are also applicable to heliports. In other words, where a particular issue is a subject of a specification in this volume that specification will supersede any other specification on that particular issue in Volume I. Throughout this volume the term "heliport" is used; however, it is intended that these specifications also apply to areas for the exclusive use of helicopters at an aerodrome primarily meant for the use of aeroplanes.~~

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

1.1 Definitions

When the following terms are used in this volume, they have the meanings given below. Annex 14, Volume I, contains definitions for those terms which are used in both volumes.

Accuracy. A degree of conformance between the estimated or measured value and the true value.

Note.— For measured positional data, the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

~~Air taxiway.~~ ~~A defined path on the surface established for the air taxiing of helicopters.~~

Air transit route. A defined ~~path on the surface established~~ route for the air transiting of helicopters.

. . .

Declared distances — heliports.

a) *Take-off distance available (TODAH).* The length of the final approach and take-off area plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

b) *Rejected take-off distance available (RTODAH).* The length of the final approach and take-off area declared available and suitable for helicopters operated in performance class 1 ~~helicopters~~ to complete a rejected take-off.

c) *Landing distance available (LDAH).* The length of the final approach and take-off area 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 conducting an emergency touch down on it.

. . .

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 ~~performance class 1~~ helicopters operated in performance class 1, the defined area includes the rejected take-off area available.

. . .

Helicopter air taxiway. A defined path on the surface established for the air taxiing of helicopters.

Helicopter clearway. A defined area on the ground or water ~~under the control of the appropriate authority~~, selected and/or prepared as a suitable area over which a ~~performance class 1~~ helicopter operated in performance class 1 may accelerate and achieve a specific height.

Helicopter ground taxiway. A ground taxiway intended for the ground movement of wheeled undercarriage helicopters.~~for use by helicopters only.~~

Helicopter stand. An aircraft stand which provides for parking a helicopter and, where ~~air taxiing~~ ground taxi operations are completed~~contemplated~~, or where the helicopter ~~touchdown~~ touches down and lifts-off for air taxi operations.

Helideck. A heliport located on ~~a floating or fixed~~ an off-shore structure such as an exploration or production platform used for the exploitation of oil or gas.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

a) are located on an area intended for the surface movement of aircraft; or ~~that~~

b) extend above a defined surface intended to protect aircraft in flight; or

c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation**.**

. . .

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

. . .

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

. . .

Shipboard heliport. A heliport located on a ship that may be purpose or non-purpose built. A purpose built shipboard heliport is one designed specifically for helicopter operations. A non-purpose built shipboard heliport is one that utilizes an area of the ship that is capable of supporting a helicopter but not designed specifically for that task.

Static load-bearing surface A surface capable of supporting the mass of a helicopter situated upon it.

. . .

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

Touchdown and lift-off area (TLOF). An ~~load bearing~~ area on which a helicopter may touch down or lift off.

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

1.2 Applicability

Note. — The dimensions discussed in this Annex are based on consideration of single main rotor helicopters. For tandem rotor helicopters the heliport design will be based on a case-by-case review of the specific models using the basic requirement for a safety area and protection areas specified in this Annex.

1.2.1 The interpretation of some of the specifications in the Annex expressly requires the exercising of discretion, the taking of a decision or the performance of a function by the appropriate authority. In other specifications, the expression appropriate authority does not actually appear although its inclusion is implied. In both cases, the responsibility for whatever determination or action is necessary shall rest with the State having jurisdiction over the heliport.

1.2.2 The specifications in Annex 14, Volume II, shall apply to all heliports intended to be used by helicopters in international civil aviation. They shall apply equally to areas for the exclusive use of helicopters at an aerodrome primarily meant for the use of aeroplanes. Where relevant, the provisions of Annex 14, Volume I shall apply to the helicopter operations being conducted at such an aerodrome. ~~The specifications of Annex 14, Volume I, shall apply, where appropriate, to these heliports as well.~~

1.2.3 ~~Wherever a colour is referred to in this volume, the specifications for that colour given in Appendix 1 to Annex 14, Volume I, shall apply.~~ Unless otherwise specified, the specification for a colour referred to within this volume shall be that contained in Appendix 1 to Annex 14, Volume I.

CHAPTER 3. PHYSICAL CHARACTERISTICS

3.1 Surface-level heliports

Note 1.— The following specifications are for ~~surface-level~~ land based heliports only. ~~(except where specified)~~ Where a water heliport is being considered, the appropriate authority may establish suitable criteria.

Note 2. — The dimensions of the taxi-routes and helicopter stands include a protection area.

Final approach and take-off areas

. . .

3.1.2 A FATO shall be obstacle free.

3.1.2~~2~~3 The dimensions of a FATO shall be:

a) ~~for a heliport intended to be used by performance class1 helicopters, as prescribed in the helicopter flight manual except that, in the absence of width specifications, the widthshall be not less than 1.5 times the over-all length/width, whichever is greater, of the longest/widest helicopter the heliport is intended to serve~~ where intended to be used by helicopters operated in performance class 1, as prescribed in the helicopter flight manual (HFM) except that, in the absence of width specifications, the width shall be not less than the greatest overall dimension (D) of the largest helicopter the FATO is intended to serve;

b) where intended to be used by helicopters operated in performance class 2 or 3, of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than:

i) 1D of the largest helicopter when the maximum take-off mass (MTOM) of helicopters the FATO is intended to serve is more than 3175 kg,

ii) 0.83 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3175 kg or less.

~~b) for a water heliport intended to be used by performance class 1 helicopters, as prescribed in a) above, plus 10 per cent;~~

~~c) for a heliport intended to be used by performance class2 and 3 helicopters, of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than 1.5 times the over-all length/width, whichever is greater, of the longest/widest helicopter the heliport is intended to serve; and~~

~~d) for a water heliport intended to be used by performance class 2 and 3 helicopters, of sufficient size to contain an area within which can be drawn a circle of diameter not less than two times the over-all length/width, whichever is greater, of the longest/widest helicopter the heliport is intended to serve.~~

Note.— Where the term FATO is not used in the helicopter flight manual (HFM), the minimum landing/takeoff area specified in the HFM for the appropriate flight profile is used.

3.1.4 **Recommendation.—** *Where intended to be used by helicopters operated in performance class 2 or 3 with MTOM of 3175 kg or less, the FATO should be of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than 1 D.*

Note.— Local conditions, such as elevation and temperature, may need to be considered when determining the size of a FATO. Guidance is given in the Heliport Manual.

3.1.~~3~~5 The ~~over-all~~ mean slope in any direction on the FATO shall not exceed 3 per cent. No portion of a FATO shall have a local slope exceeding:

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

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

3.1.~~4~~6 The surface of the FATO shall:

a) be resistant to the effects of rotor downwash;

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

c) have bearing strength sufficient to accommodate a rejected take-off by ~~performance class 1~~ helicopters operated in performance class 1.

3.1.7 The surface of a FATO surrounding a TLOF intended for use by helicopters operated in performance classes 2 and 3, shall be static load bearing.

3.1.~~5~~8 **Recommendation.—** *The FATO should provide ground effect.*

Helicopter clearways

3.1.~~6~~9 When ~~it is necessary to provide~~ a helicopter clearway is provided, it shall be located beyond the ~~upwind~~ end of the rejected take-off area available.

3.1.~~7~~10 **Recommendation.—** *The width of a helicopter clearway should not be less than that of the associated safety area.*

3.1.~~8~~11 **Recommendation.—** *The ground in a helicopter clearway should not project above a plane having an upward slope of 3 per cent, the lower limit of this plane being a horizontal line which is located on the periphery of the FATO.*

3.1.~~9~~12 **Recommendation.—** *An object situated on a helicopter clearway which may endanger helicopters in the air should be regarded as an obstacle and should be removed.*

Touchdown and lift-off areas

3.1.~~10~~13 At least one touchdown and lift-off area (TLOF) shall be provided at a heliport.

Note 1.— The ~~touchdown and lift-off area~~ TLOF may or may not be located within the FATO.

Note 2.— Additional TLOFs may be collocated with helicopter stands.

3.1.~~11~~14 The ~~touchdown and lift-off area (~~TLOF~~)~~ shall be of sufficient size to contain a circle of diameter of at least 0.83D~~1.5 times the length or width of the undercarriage, whichever is the greater,~~ of the largest helicopter the area is intended to serve.

Note.— A ~~touchdown and lift-off area~~ TLOF may be any shape.

3.1.~~12~~15 Slopes on a ~~touchdown and lift-off area~~ TLOF shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.

3.1.16 Where the TLOF is within the FATO, the TLOF shall be dynamic load bearing.

3.1.~~13~~17 Where a ~~A touchdown and lift-off area~~ TLOF is collocated with a helicopter stand, the TLOF shall be static load bearing and be capable of withstanding the traffic of helicopters that the area is intended to serve.

3.1.18 Where the TLOF is within the FATO, the centre of the TLOF shall be located not less than 0.5 D from the edge of the FATO.

Safety areas

3.1.~~14~~19 A FATO shall be surrounded by a safety area which need not be solid.

3.1.~~15~~20 A safety area surrounding a FATO intended to be used by helicopters operated in performance class 1, in visual meteorological conditions (VMC) shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 D~~times the over-all length/width~~, whichever is greater, of the ~~longest/widest~~ largest helicopter the FATO is intended to serve~~.~~ and:

a) each external side of the safety area shall be at least 2 D where the FATO is quadrilateral; or

b) the outer diameter of the safety area shall be at least 2 D where the FATO is circular.

3.1.21 A safety area surrounding a FATO intended to be used by helicopters operated in performance class 2 or 3 in visual meteorological conditions (VMC) shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.5 D, whichever is the greater, of the largest helicopter the FATO is intended to serve, and:

a) each external side of the safety area shall be at least 2 D where the FATO is quadrilateral; or

b) the outer diameter of the safety area shall be at least 2 D where the FATO is circular.

3.1.22 There shall be a protected side slope rising at 45° from the edge of the safety area to a distance of 10 meters, whose surface shall not be penetrated by obstacles; except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface.

3.1.~~16~~23 A safety area surrounding a FATO intended to be used by helicopter operations in instrument meteorological conditions (IMC) shall extend:

a) laterally to a distance of at least 45 m on each side of the centre line; and

b) longitudinally to a distance of at least 60 m beyond the ends of the FATO.

Note.— See Figure 3-1.

3.1.~~17~~24 No fixed object shall be permitted on a safety area, except for frangible objects, which, because of their function, must be located on the area. No mobile object shall be permitted on a safety area during helicopter operations.

3.1.~~18~~25 Objects whose functions require them to be located on the safety area shall not exceed a height of 25 cm when located along the edge of the FATO nor penetrate a plane originating at a height of 25 cm above the edge of the FATO and sloping upwards and outwards from the edge of the FATO at a gradient of 5 per cent.

3.1.26 **Recommendation**.— *In the case of a FATO of diameter less than 1D, the maximum height of the objects whose functions require them to be located on the safety area should not exceed a height of 5 cm.*

3.1.~~19~~27 The surface of the safety area, when solid, shall not exceed an upward slope of 4 per cent outwards from the edge of the FATO.

3.1.~~20~~28 Where applicable, t~~T~~he surface of the safety area shall be treated to prevent flying debris caused by rotor downwash.

3.1.~~21~~29 The surface of the safety area abutting the FATO shall be continuous with the FATO ~~and be capable of supporting, without structural damage, the helicopters that the heliport is intended to serve~~.

Helicopter ground taxiways~~ ***and ground taxi-routes***

Note 1.— A helicopter ground taxiway is intended to permit the surface movement of a wheeled helicopter under its own power. ~~The specifications for taxiways, taxiway shoulders and taxiway strips included in Annex 14, Volume I are equally applicable to heliports as modified below. When a taxiway is intended for use by aeroplanes and helicopters, the provisions for taxiways and helicopter ground taxiways will be examined and the more stringent requirements will be applied.~~

Note 2.— The following specifications are intended for the safety of simultaneous operations during the manoeuvring of helicopters. However, the wind velocity induced by the rotor downwash might have to be considered.

Note 3.— When a taxiway is intended for use by aeroplanes and helicopters, the provisions for taxiways for aeroplanes and helicopter ground taxiways will be taken into consideration and the more stringent requirements will be applied.

3.1.~~22~~30 The width of a helicopter ground taxiway shall not be less than~~:~~ 1.5 times the largest width of the undercarriage (UCW) of helicopters the ground taxiway is intended to serve.

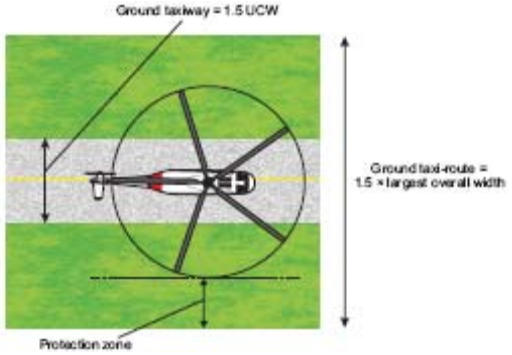

Figure 3-2. Ground taxi-route.

~~Helicopter main gear span~~	~~Helicopter ground taxiway width~~
~~Up to but not including 4.5 m~~	~~7.5 m~~
~~4.5 m up to but not including 6 m~~	~~10.5 m~~
~~6 m up to but not including 10 m~~	~~15 m~~
~~10 m and over~~	~~20 m~~

~~3.1.23 The separation distance between a helicopter ground taxiway and another helicopter ground taxiway, an air taxiway, an object or helicopter stand shall not be less than the appropriate dimension specified in Table 3-1.~~

3.1.~~24~~31 The longitudinal slope of a helicopter ground taxiway shall not exceed 3 per cent.

3.1.~~25~~32 **~~Recommendation.—~~** A helicopter ground taxiway ~~should~~ shall be static load bearing and be capable of withstanding the traffic of helicopters that the helicopter ground taxiway is intended to serve.

3.1.33 A helicopter ground taxiway shall be centred in a ground taxi-route.

3.1.34 A helicopter ground taxi-route shall extend symmetrically on each side of the centreline for at least 0.75 times the largest overall width of the helicopters that it is intended to serve.

3.1.35 No objects shall be permitted on a helicopter ground taxi-route, except for frangible objects, which, because of their function, must be located there.

~~3.1.26 **Recommendation.** — *A helicopter ground taxiway should be provided with shoulders which extend symmetrically on each side of the helicopter ground taxiway for at least one- half the greatest over-all width of the helicopters that the helicopter ground taxiway is intended to serve.*~~

3.1.~~27~~36 The helicopter ground taxiway and the ground taxi-route ~~its shoulder~~ shall provide rapid drainage but the helicopter ground taxiway transverse slope shall not exceed 2 per cent.

3.1.~~28~~37 **Recommendation.** — The surface of a helicopter ground ~~taxiway shoulder should~~ taxi-route shall be resistant to the effect of rotor downwash.

Helicopter A**air taxiways **and air taxi-routes

Note.— An air taxiway is intended to permit the movement of a helicopter above the surface at a height normally associated with ground effect and at groundspeed less than 37km/h (20 kt).

3.1.~~29~~38 The width of ~~an~~ a helicopter air taxiway shall be at least two times the ~~greatest over-all width~~ largest width of the undercarriage (UCW) of the helicopters that the air taxiway is intended to serve.

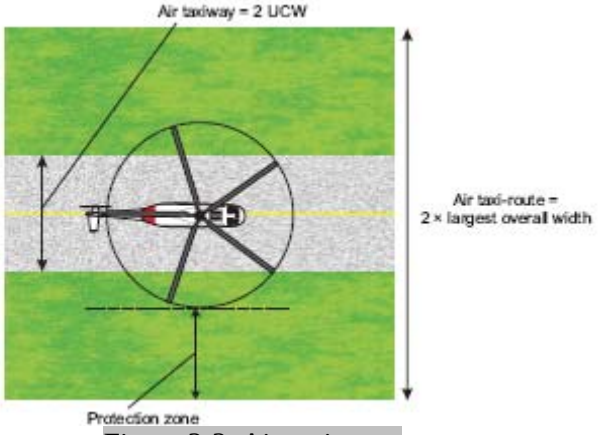

Figure 3-3. Air taxi-route

3.1.~~30~~39 The surface of ~~an~~ a helicopter air taxiway shall be suitable for an emergency landing. ~~:~~

a) ~~be resistant to the effects of rotor downwash; and~~

~~b) be suitable for emergency landings.~~

3.1.40 **Recommendation.**— *The surface of a helicopter air taxiway should be static load bearing.*

~~3.1.31 **Recommendation.—** *The surface of an air taxiway should provide ground effect.*~~

3.1.~~32~~41 **Recommendation.—** *The transverse slope of the surface of a helicopter ~~an~~ air taxiway should not exceed 10 per cent and the longitudinal slope should not exceed 7 per cent. In any event, the slopes should not exceed the slope landing limitations of the helicopters the air taxiway is intended to serve.*

3.1.42 A helicopter air taxiway shall be centred in an air taxi-route.

3.1.43 A helicopter air taxi-route shall extend symmetrically on each side of the centreline for a distance at least equal to the largest overall width of the helicopters that it is intended to serve.

3.1.44 No objects shall be permitted on an air taxi-route, except for frangible objects, which, because of their function, must be located thereon.

3.1.45 The surface of an air taxi-route shall be resistant to the effect of rotor downwash.

3.1.46 The surface of an air taxi-route shall provide ground effect.

~~3.1.33 The separation distance between an air taxiway and another air taxiway, a helicopter ground taxiway, an object or a helicopter stand shall not be less than the appropriate dimension in Table 3-1.~~

~~Table 3-1. Helicopter ground taxiway and air taxiway separation distances (expressed in multiples of greatest over-all width of helicopter with rotor turning)~~

~~Facility~~	~~Helicopter ground taxiway~~	~~Air taxiway~~	~~Object~~	~~Helicopter stand~~
~~Helicopter ground taxiway~~	~~2 (between edges)~~	~~4 (between centre lines)~~	~~1 (edge to object)~~	~~2 (between edges)~~
~~Air taxiway~~	~~4 (between centre lines)~~	~~4 (between centre lines)~~	~~1l/2 (centre line to object)~~	~~4 (centre line to edge)~~

Air transit route

Note.— An air transit route is intended to permit the movement of a helicopter above the surface, normally at heights not above 30 m (100 ft) above ground level and at ground speeds exceeding 37 km/h (20 kt).

3.1.~~34~~47 The width of an air transit route shall not be less than:

a) 7.0 times the largest overall width of the helicopters the air transit route is intended to serve ~~RD~~ when the air transit route is intended for use by day only; and

b) 10.0 times the largest overall width of the helicopters the air transit route is intended to serve ~~RD~~ when the air transit route is intended for use at night~~;~~.

~~when RD is the diameter of the largest rotor of the helicopters that the air transit route is intended to serve.~~

3.1.~~35~~48 Any variation in the direction of the centre line of an air transit route shall not exceed 120° and be designed so as not to necessitate a turn of radius less than 270 m.

Note.— It is intended that air transit routes be selected so as to permit autorotative 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.

Aprons

~~*Note.— The specifications for aprons included in Chapter3 of Annex 14, Volume I are equally applicable to heliports as modified below.*~~

3.1.~~36~~49 The slope in any direction on a helicopter stand shall not exceed 2 per cent.

~~3.1.37 The minimum clearance between a helicopter using a helicopter stand and an object or any aircraft on another stand shall not be less than half the greatest over-all width of the helicopters that the stand is intended to serve.~~

~~*Note. — Where simultaneous hover operations are to be provided for, the separation distances specified in Table 3-1 between two air taxiways are to be applied.*~~

3.1.~~38~~50 A helicopter stand shall be of sufficient size to contain a circle of diameter of at least 1.2 D ~~the largest over-all dimension~~ of the largest helicopter the stand is ~~expected~~ intended to serve.

3.1.51 If a helicopter stand is used for taxi through, the minimum width of the stand and associated protection area shall be that of the taxi-route.

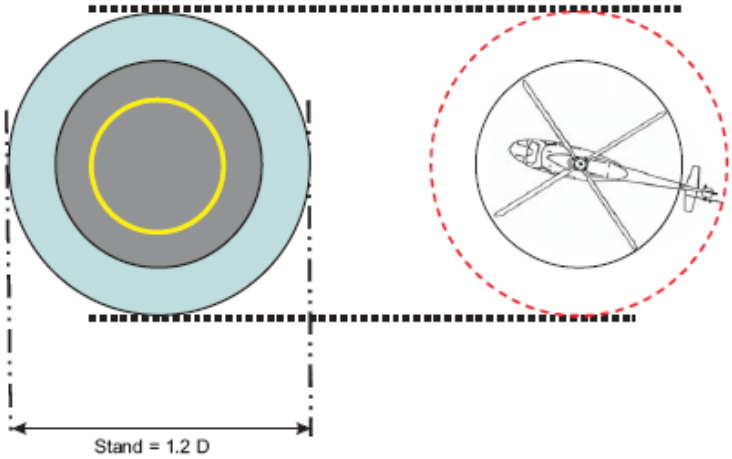

Figure 3-4. Helicopter stand

3.1.52 When a helicopter stand is used for turning, the minimum dimension of the stand and protection area shall be not less than 2 D.

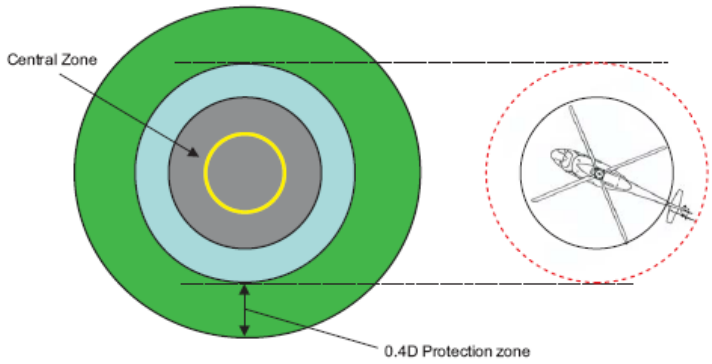

Figure 3-5. Helicopter stand protection area.

3.1.53 When a helicopter stand is used for turning, it shall be surrounded by a protection area which extends for a distance of 0.4 D from the edge of the helicopter stand.

3.1.54 For simultaneous operations, the protection area of helicopter stands and their associated taxi-routes shall not overlap.

Note.— Where non-simultaneous operations are envisaged, the protection area of helicopter stands and their associated taxi-routes may overlap.

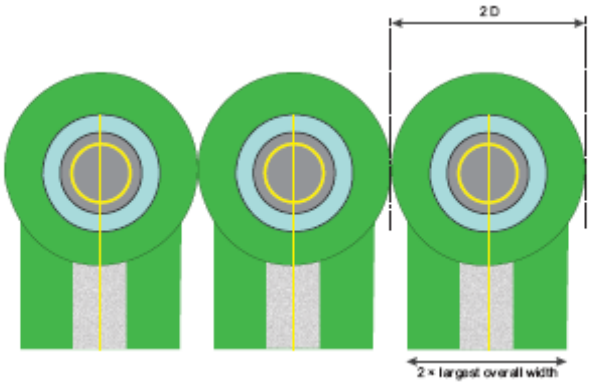

Figure 3-6. Helicopter stands designed for hover turns with air taxi-routes/taxiways – simultaneous operations

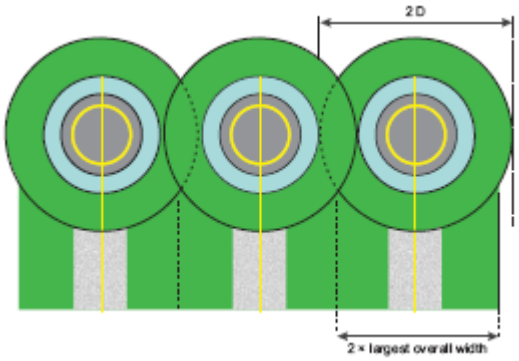

Figure 3-7. Helicopter stands designed for hover turns with air taxi-routes/taxiways – non-simultaneous operations

3.1.55 When intended to be used for ground taxi operations by wheeled helicopters, the dimensions of a helicopter stand shall take into account the minimum turn radius of wheeled helicopters the stand is intended to serve.

3.1.56 A helicopter stand and associated protection area intended to be used for air taxiing shall provide ground effect.

3.1.57 No fixed objects shall be permitted on a helicopter stand and the associated protection area.

3.1.58 The central zone of the stand shall be capable of withstanding the traffic of helicopters that it is intended to serve and have a static load-bearing area:

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

b) for a helicopter stand intended to be used for ground taxi-through, the same width as the ground taxiway.

Note.— For a helicopter stand intended to be used for turning on the ground, the dimension of the central zone may need to be increased.

Location of a final approach and take-off area in relation to a runway or taxiway

3.1.~~39~~59 Where a FATO is located near a runway or taxiway, and simultaneous VMC operations are planned, the separation distance between the edge of a runway or taxiway and the edge of a FATO shall not be less than the appropriate dimension in Table 3-2.

3.1.~~40~~60 **Recommendation.—** *A FATO should not be located:*

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

b) near areas where aeroplane vortex wake generation is likely to exist.

Table 3-2. FATO minimum separation distance

If aeroplane mass and/or helicopter mass are	Distance between FATO edge and runway edge or taxiway edge
up to but not including ~~2 720~~ 3175 kg	60 m
~~2 720~~ 3175 kg up to but not including 5 760 kg	120 m
5 760 kg up to but not including 100 000 kg	180 m
100 000 kg and over	250 m

3.2 Elevated heliports

Note 1. — The dimensions of the taxi-routes and helicopter stands include a protection area.

Note 2. — Guidance on structural design for elevated heliports is given in the Heliport Manual.

3.2.1 In the case of elevated heliports, design considerations of the different elements of the heliport shall take into account additional loading resulting from the presence of personnel, snow, freight, refuelling, fire fighting equipment, etc.

Final approach and take-off area and touchdown and lift-off area

Note.— On elevated heliports it is presumed that the FATO and ~~the~~ one touchdown and lift-off area will be coincidental.

3.2.~~1~~2 An elevated heliport shall be provided with at least one FATO.

3.2.3 A FATO shall be obstacle free.

3.2.~~2~~4 The dimensions of the FATO shall be:

a) ~~for a heliport intended to be used by performance class1 helicopters, as prescribed in the helicopter flight manual except that, in the absence of width specifications, the width shall be not less than 1.5 times the over-all length/width, whichever is greater, of the longest/widest helicopter the heliport is intended to serve; and~~ where intended to be used by helicopters operated in performance class 1, as prescribed in the helicopter flight manual (HFM) except that, in the absence of width specifications, the width shall be not less than 1 D of the largest helicopter the FATO is intended to serve;

b) ~~for a heliport intended to be used by performance class2 helicopters, of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than 1.5 times the over-all length/ width, whichever is greater, of the longest/widest helicopter the heliport is intended to serve.~~ where intended to be used by helicopters operated in performance class 2 or 3, of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than:

i) 1 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is more than 3175 kg,

ii) 0.83 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3175 kg or less.

3.2.5 **Recommendation**.— *Where intended to be used by helicopters operated in performance class 2 or 3 with MTOM of 3175 kg or less, the FATO should be of sufficient size and shape to contain an area within which can be drawn a circle of diameter not less than 1 D.*

Note.— Local conditions, such as elevation and temperature, may need to be considered when determining the size of a FATO. Guidance is given in the Heliport Manual.

~~3.2.3 **Recommendation.** — *The slope requirements for elevated heliports should conform to the requirements for surface level heliports specified in 3.1.3.*~~

3.2.6 Slopes on a FATO at an elevated heliport shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.

3.2.7 The FATO shall be dynamic load bearing.

3.2.8 The surface of the FATO shall:

a) be resistant to the effects of rotor downwash; and

b) be free of irregularities that would adversely affect the take-off or landing of helicopters.

~~3.2.4 The FATO shall be capable of withstanding the traffic of helicopters the heliport is intended to serve. Design considerations shall take into account additional loading resulting from the presence of personnel, snow, freight, refuelling, fire fighting equipment, etc.~~

~~*Note.— Guidance on structural design for elevated heliports is given in the* Heliport Manual.~~

3.2.9 **Recommendation**.— *The FATO should provide ground effect.*

Helicopter clearways

3.2.10 When a helicopter clearway is provided, it shall be located beyond the end of the rejected take-off area available.

3.2.11 **Recommendation**.— *The width of a helicopter clearway should not be less than that of the associated safety area.*

3.2.12 **Recommendation**.— *When solid, the surface of the helicopter clearway should not project above a plane having an upward slope of 3 per cent, the lower limit of this plane being a horizontal line which is located on the periphery of the FATO.*

3.2.13 **Recommendation**.— *An object situated on a helicopter clearway which may endanger helicopters in the air should be regarded as an obstacle and should be removed.*

Touchdown and lift-off areas

3.2.14 One TLOF shall be coincidental with the FATO.

Note.— Additional TLOFs may be collocated with helicopter stands.

3.2.15 For a TLOF coincidental with the FATO, the dimensions and the characteristics of the TLOF shall be the same as those of the FATO.

3.2.16 When the TLOF is collocated with a helicopter stand, the TLOF shall be of sufficient size to contain a circle of diameter 0.83 D of the largest helicopter the area is intended to serve.

3.2.17 Slopes on a TLOF collated with a helicopter stand shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.

3.2.18 When the TLOF is collocated with a helicopter stand and intended to be used by ground taxiing helicopters only, the TLOF shall at least be static load bearing and be capable of withstanding the traffic of helicopters that the area is intended to serve.

3.2.19 When the TLOF is collocated with a helicopter stand and intended to be used by air taxiing helicopters, the TLOF shall have a dynamic load-bearing area.

Safety area

3.2.~~5~~20 The FATO shall be surrounded by a safety area which need not be solid.

3.2.21 A safety area surrounding a FATO intended to be used by helicopters operated in performance class 1, in visual meteorological conditions (VMC) shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 D, whichever is greater, of the largest helicopter the FATO is intended to serve and:

a) each external side of the safety area shall be at least 2 D where the FATO is quadrilateral; or

b) the outer diameter of the safety area shall be at least 2 D where the FATO is circular.

3.2.22 A safety area surrounding a FATO intended to be used by helicopters operated in performance class 2 or 3 in visual meteorological conditions (VMC), shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.5 D, whichever is the greater, of the largest helicopter the FATO is intended to serve:

a) each external side of the safety area shall be at least 2 D where the FATO is quadrilateral; or

b) the outer diameter of the safety area shall be at least 2 D where the FATO is circular.

3.2.23 There shall be a protected side slope rising at 45° from the edge of the safety area to a distance of 10 meters, whose surface shall not be penetrated by obstacles; except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface.

~~3.2.6 The safety area shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25times the over-all length/width, whichever is greater, of the longest/widest helicopter intended to use the elevated heliport.~~

3.2.~~7~~24 No fixed object shall be permitted on a safety area, except for frangible objects, which, because of their function, must be located on the area. No mobile object shall be permitted on a safety area during helicopter operations.

3.2.~~8~~25 Objects whose function require them to be located on the safety area shall not exceed a height of 25 cm when located along the edge of the FATO nor penetrate a plane originating at a height of 25 cm above the edge of the FATO and sloping upwards and outwards from the edge of the FATO at a gradient of 5 per cent.

3.2.26 **Recommendation**.— *In the case of a FATO of diameter less than 1D, the maximum height of the objects whose functions require them to be located on the safety area should not exceed a height of 5 cm.*

3.2.~~9~~27 The surface of the safety area, when solid, shall not exceed an upward slope of 4 per cent outwards from the edge of the FATO.

3.2.28 Where applicable, the surface of the safety area shall be prepared in a manner to prevent flying debris caused by rotor downwash.

3.2.~~10~~29 The surface of the safety area abutting the FATO shall be continuous with the FATO. ~~and be capable of supporting, without structural damage, the helicopters that the heliport is intended to serve.~~

Helicopter ground taxiways and ground taxi-routes

Note. — The following specifications are intended for the safety of simultaneous operations during the manoeuvring of the helicopters. However, the wind velocity induced by the rotor downwash might have to be considered.

3.2.30 The width of a helicopter ground taxiway shall not be less than 2 times the largest width of the undercarriage (UCW) of helicopters the ground taxiway is intended to serve.

3.2.31 The longitudinal slope of a helicopter ground taxiway shall not exceed 3 per cent.

3.2.32 A helicopter ground taxiway shall be static load bearing and be capable of withstanding the traffic of helicopters that the helicopter ground taxiway is intended to serve.

3.2.33 A helicopter ground taxiway shall be centred in a ground taxi-route.

3.2.34 A helicopter ground taxi-route shall extend symmetrically on each side of the centreline to a distance not less than the largest overall width of the helicopters that it is intended to serve.

3.2.35 No objects shall be permitted on a helicopter ground taxi-route, except for frangible objects, which, because of their function, must be located there.

3.2.36 The helicopter ground taxiway and the ground taxi-route shall provide rapid drainage but the helicopter ground taxiway transverse slope shall not exceed 2 per cent.

3.2.37 The surface of a helicopter ground taxi-route shall be resistant to the effect of rotor downwash.

Helicopter air taxiways and taxi-routes

Note. — An air taxiway is intended to permit the movement of a helicopter above the surface at a height normally associated with ground effect and at groundspeed less than 37 km/h (20 kt).

3.2.38 The width of a helicopter air taxiway shall be at least three times the largest undercarriage (UCW) of the helicopters that the air taxiway is intended to serve.

3.2.39 The surface of a helicopter air taxiway shall be dynamic load bearing.

3.2.40 The transverse slope of the surface of a helicopter air taxiway shall not exceed 2 per cent and the longitudinal slope shall not exceed 7 per cent. In any event, the slopes shall not exceed the slope landing limitations of the helicopters the air taxiway is intended to serve.

3.2.41 A helicopter air taxiway shall be centred in an air taxi-route.

3.2.42 A helicopter air taxi-route shall extend symmetrically on each side of the centreline to a distance not less than the largest overall width of the helicopters that it is intended to serve.

3.2.43 No objects shall be permitted on an air taxi-route, except for frangible objects, which, because of their function, must be located thereon.

3.2.44 The surface of an air taxi-route shall be resistant to the effect of rotor downwash.

3.2.45 The surface of an air taxi-route shall provide ground effect.

Aprons

3.2.46 The slope in any direction on a helicopter stand shall not exceed 2 per cent.

3.2.47 A helicopter stand shall be of sufficient size to contain a circle of diameter of at least 1.2 D of the largest helicopters the stand is intended to serve.

3.2.48 If a helicopter stand is used for taxi-through, the minimum width of the stand and associated protection area shall be that of the taxi-route.

3.2.49 When a helicopter stand is used for turning, the minimum dimension of the stand and protection area shall be not less than 2 D.

3.2.50 When a helicopter stand is used for turning, it shall be surrounded by a protection area which extends for a distance of 0.4 D from the edge of the helicopter stand.

3.2.51 For simultaneous operations, the protection area of helicopter stands and their associated taxi-routes shall not overlap.

Note.— Where non-simultaneous operations are envisaged, the protection area of helicopter stands and their associated taxi-routes may overlap.

3.2.52 When intended to be used for ground taxi operations by wheeled helicopters, the dimensions of a helicopter stand shall take into account the minimum turn radius of wheeled helicopters the stand is intended to serve.

3.2.53 A helicopter stand and associated protection area intended to be used for air taxiing shall provide ground effect.

3.2.54 No fixed objects shall be permitted on a helicopter stand and the associated protection area.

3.2.55 The central zone of the helicopter stand shall be capable of withstanding the traffic of helicopters that it is intended to serve and have a load bearing area:

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

b) for a helicopter stand intended to be used for ground taxi through the same width as ground taxiway.

3.2.56 The central zone of a helicopter stand intended to be used for ground taxiing only shall be static load-bearing.

3.2.57 The central zone of a helicopter stand intended to be used for air taxiing shall be dynamic load-bearing.

Note.— For a helicopter stand intended to be used for turning on the ground, the dimension of the central zone might have to be increased.

3.3 Helidecks

Note.— The following specifications are for helidecks located on structures engaged in such activities as mineral exploitation, research or construction. See 3.4 for shipboard heliport provisions.

Final approach and take-off area and touchdown and lift-off area TLOF

Note.— On helidecks it is presumed that the FATO and the touchdown and lift-off area will be coincidental. Reference to FATO within the helideck section of this Annex is assumed to include the TLOF. Guidance on the effects of airflow direction and turbulence, prevailing wind velocity and high temperatures from gas turbine exhausts or flare radiated heat on the location of the FATO is given in the Heliport Manual.

3.3.1 The specifications in paragraphs 3.3.9 and 3.3.10 shall be applicable for helidecks completed on or after 1 January 2012.

3.3.2~~1~~ A helideck shall be provided with at least one FATO.

3.3.2~~3~~ A FATO may be any shape but shall~~, for a single main rotor helicopter or side by side twin main rotor helicopter,~~ be of sufficient size to contain: ~~contain an area within which can be drawn a circle of diameter not less than 1.0 times D of the largest helicopter the helideck is intended to serve, where D is the largest dimension of the helicopter when the rotors are turning.~~

a) for helicopters with a MTOM of more than 3175 kg, an area within which can be accommodated a circle of diameter of not less than 1.0 D of the largest helicopter the helideck is intended to serve.

b) for helicopters with a MTOM of 3175 kg or less, an area within which can be accommodated a circle of diameter of not less than 0.83 D of the largest helicopter the helideck is intended to serve.

~~3.3.3 Where omnidirectional landings by helicopters having tandem main rotors are intended, the FATO shall be of sufficient size to contain an area within which can be drawn a circle of diameter not less than 0.9 times the distance across the rotors in a fore and aft line. Where these provisions cannot be met, the FATO may be in the form of a rectangle with a small side not less than 0.75 D and a long side not less than 0.9 D but within this rectangle, bi-directional landings only will be permitted in the direction of the 0.9 D dimension.~~

3.3.4 **Recommendation.—** *For helicopters with a MTOM of 3175 kg or less, the FATO should be of sufficient size to contain an area within which can be accommodated a circle of diameter of not less than 1.0 D of the largest helicopter the helideck is intended to serve.*

3.3.5 A FATO shall be dynamic load bearing.

3.3.6 A FATO shall provide ground effect.

3.3.~~4~~7 No fixed object shall be permitted around the edge of the FATO except for frangible objects, which, because of their function, must be located thereon.

3.3.~~5~~8 Objects whose function require them to be located on the edge of the FATO shall not exceed a height of 25 cm~~.~~ , except that in the case of a FATO of diameter less than 1D the maximum height of such objects shall not exceed a height of 5 cm.

3.3.9 Objects whose function requires them to be located within the FATO (such as lighting or nets) shall not exceed a height of 2.5 cm.. Such objects may 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.

3.3.10 Safety net or safety shelves shall be located around the edge of a helideck but shall not exceed the helideck height.

3.3.~~6~~11 The surface of the FATO shall be skid-resistant to both helicopters and persons and be sloped to prevent pooling of ~~liquids~~ water. ~~Where the helideck is constructed in the form of a grating, the underdeck design shall be such that ground effect is not reduced.~~

Note.— Guidance on rendering the surface of the FATO skid-resistant is contained in the Heliport Manual.

3.4 Shipboard heliports

3.4.1 The specifications in paragraph~~s, 3.4.3, 3.4.5, 3.4.6 and 3.4.8 to~~ 3.4.11 shall be applicable to shipboard heliports completed on or after 1 January 2012.

3.4.1~~3~~2 When helicopter operating areas are provided in the bow or stern of a ship or are purpose-built above the ship's structure, they shall be regarded as ~~helidecks~~ purpose-built shipboard heliports. ~~and the criteria given in 3.3 shall apply.~~

Final approach and take-off area and touchdown and lift-off area

Note.— On shipboard heliports, ~~located in other areas of ships~~ it is presumed that the FATO and the ~~touchdown and lift-off area~~ TLOF will be coincidental. Reference to FATO within the shipboard heliport section of this Annex is assumed to include the TLOF. Guidance on the effects of airflow direction and turbulence, prevailing wind velocity and high temperature from gas turbine exhausts or flare radiated heat on the location of the FATO is given in the Heliport Manual.

3.4.2~~2~~43 Shipboard heliports shall be provided with at least one FATO.

3.4.5~~4~~4 The FATO of a shipboard heliport shall be dynamic load bearing.

3.4.6~~5~~5 The FATO of a shipboard heliport shall provide ground effect.

3.4.3~~86~~ ~~A FATO on a shipboard heliport shall be circular and shall be of sufficient size to contain a diameter not less than 1.0 times D of the largest helicopter the heliport is intended to serve where D is the largest dimension of the helicopter when the rotors are turning.~~ For purpose-built shipboard heliports provided in a location other than the bow or stern the FATO shall be of sufficient size to contain a circle with a diameter not less than 1.0 D of the largest helicopter the heliport is intended to serve.

3.4.7 For purpose-built shipboard heliports provided in the bow or stern of a ship, the FATO shall be of sufficient size to:

a) contain a circle with a diameter not less than 1 D of the largest helicopter the heliport is intended to serve; or

b) for operations with limited touchdown directions, contain an area within which can be accommodated two opposing arcs of a circle with a diameter of not less than 1 D in the helicopters longtitudinal direction. The minimum width of the heliport shall be not less than 0.83 D.(See Figure 3.7).

Note 1.— The ship will need to be manoeuvred to ensure that the relative wind is appropriate to the direction of the helicopter touchdown heading.

Note 2.— The touchdown heading of the helicopter is limited to the angular distance subtended by the 1 D arcs headings, minus the angular distance which corresponds to 15 degrees at each end of the arc.

3.4.8 For non-purpose built shipboard heliports, the FATO shall be of sufficient size to contain a circle with a diameter not less than 1 D of the largest helicopter the helideck is intended to serve.

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

3.4.10 Objects whose function require them to be located on the edge of the FATO shall not exceed a height of 25 cm.

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

3.4.4~~12~~ The surface of the FATO shall be skid-resistant to both helicopters and persons.

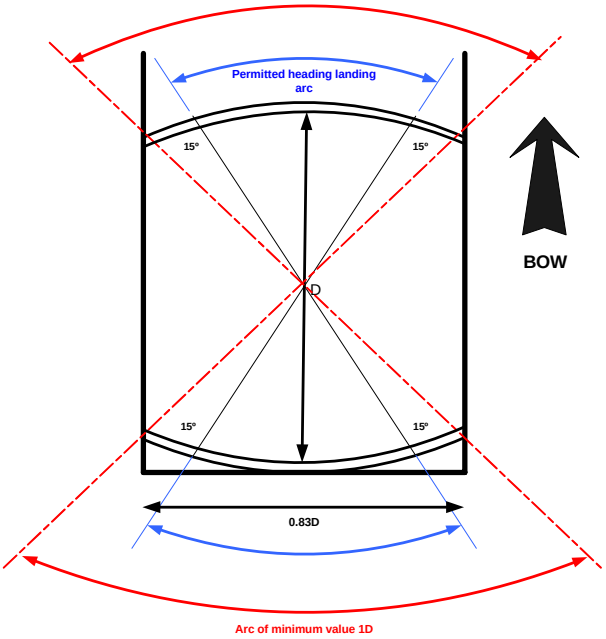

Figure 3-8. Shipboard permitted landing headings for limited heading operations

CHAPTER 4. OBSTACLE RESTRICTION AND REMOVAL

4.1 Obstacle limitation surfaces and sectors

…

Obstacle-free sector/surface — helidecks

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

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

~~4.1.2325 For helidecks the obstacle-free sector shall subtend an arc of 210° and extend outwards to a distance compatible with the one-engine inoperative capability of the most critical helicopter the helideck is intended to serve. The surface shall be a horizontal plane level with the elevation of the helideck except that, over an arc of 180° passing through the centre of the FATO, the surface shall be at water level, extending outwards for a distance compatible with the take-off space required for the most critical helicopter the helideck is intended to serve (see Figure 4-2A).~~

4.1.23 A helideck obstacle-free sector shall comprise of two components, one above and one below helideck level (see Figure 4-2):

a) Above helideck level: The surface shall be a horizontal plane level with the elevation of the helideck surface that subtends an arc of at least 210° with the apex located on the periphery of the D reference circle extending outwards to a distance that will allow for an unobstructed departure path appropriate to the helicopter the helideck is intended to serve.

b) Below helideck level: Within the (minimum) 210° arc, the surface shall additionally extend downward from the edge of the FATO below the elevation of the helideck to water level for an arc of not less than 180° that passes through the centre of the FATO and outwards to a distance that will allow for safe clearance from the obstacles below the helideck in the event of an engine failure for the type of helicopter the helideck is intended to serve.

Note.— For both the above obstacle free sectors for helicopters operated in Performance class 1 or 2 the horizontal extent of these distances from the helideck will be compatible with the one-engine inoperative capability of the helicopter type to be used.

Limited obstacle surface — helidecks

Note.— Where obstacles are necessarily located on the structure, a helideck may have a limited obstacle sector.

4.1.~~24~~27~~4~~4 *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 ~~as shown in Figures 4-3, 4-4 and 4-5 and~~ within which the height of obstacles above the level of the FATO will be prescribed.

~~4.1.25~~28 ~~*Characteristics.* The limited obstacle surface shall not subtend an arc greater than a specified angle and shall be sufficient to include that area not covered by the obstacle-free sector.~~

4.1.2~~9~~5 *Characteristics.* A limited obstacle sector shall not subtend an arc greater than 150 degrees. Its dimensions and location shall be as indicated in Figure 4-3.

4.2 Obstacle limitation requirements

. . .

Helidecks

Note.— The following specifications are for helidecks located on a structure and engaged in such activities as mineral exploitation, research, or construction, but excluding heliports on ships.

4.2.12 A helideck shall have an obstacle-free sector~~, and, where necessary, a limited obstacle sector.~~

Note.— A helideck may have a limited obstacle sector (see paragraph 4.1.25).

4.2.13 There shall be no fixed obstacles within the obstacle-free sector above the obstacle-free surface.

4.2.14 In the immediate vicinity of the helideck, obstacle protection for helicopters shall be provided below the heliport level. This protection shall extend over an arc of at least 180° 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° sector. This descending gradient may be reduced to a ratio of one unit horizontally to three within the 180° sector for multi-engine helicopters operated in performance class 1 or 2 (see Figure 4-2).

4.2.15 Where a mobile obstacle or combination of obstacles within the obstacle-free sector is essential for the operation of the installation, the obstacle(s) shall not subtend an arc exceeding 30°, as measured from the centre of the FATO.

4.2.16 ~~For single-main-rotor and side-by-side twin-rotor helicopters, w~~Within the 150° limited obstacle surface/sector out to a distance of 0.62 D, measured from the centre of the FATO, objects shall

not exceed a height of 0.05 D above the FATO. Beyond that arc, out to an over-all distance of 0.83 D the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally (see Figure 4-3).

~~4.2.17 For omnidirectional operations by tandem main rotor helicopters within the 150° limited obstacle surface/ sector out to a distance of 0.62 D, measured from the centre of the FATO, there shall be no fixed obstacles. Beyond that arc, out to an over-all distance of 0.83 D, objects shall not penetrate a level surface which has a height equivalent to 0.05D above the FATO (see Figure 4-4).~~

~~4.2.18 For bi-directional operations by tandem main rotor helicopters, within the 0.62 D arc in the 150° limited obstacle surface/sector, objects shall not penetrate a level surface which has a height equivalent to 1.1 m above the FATO (see Figure 4-5).~~

Shipboard heliports

Purpose-built heliports located forward or aft

4.2.17 The specifications in paragraphs~~,~~ 4.2.20 and 4.2.22 shall be applicable for shipboard heliports completed on or after 1 January 2012.

4.2.18 When helicopter operating areas are provided in the bow or stern of a ship they shall apply the obstacle criteria given in 4.2.12, 4.2.14 and 4.2.16 above.

Amidships location

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

4.2.20 Objects whose function requires them to be located within the FATO (such as lighting or nets) shall not exceed a height of 2.5 cm. Such objects may 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.~~20~~21 To provide further protection from obstacles fore and aft of the FATO, 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° sectors. These surfaces shall extend for a horizontal distance equal to at least 1 D of the largest helicopter the FATO is intended to serve ~~the diameter of the FATO~~ and shall not be penetrated by any obstacle (see Figure 4-11).

~~*Ship's side location*~~

Non-purpose built he*liports*
Ship's side location

4.2.22 No objects shall be located within the FATO 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 2.5cm. Such objects shall only be present if they do not represent a hazard to helicopters.

4.2.~~21~~23 From the fore and aft mid-points of the D reference circle, an area shall extend to the ship's rail to a fore and aft distance of 1.5 times the diameter of the FATO, located symmetrically about the athwartships bisector of the reference circle. Within this sector there shall be no objects rising above the level of the FATO, except those aids essential to the safe operation of the helicopter and then only up to a maximum height of 25 cm (see Figure 4-12).

4.2.~~22~~24 A horizontal surface shall be provided, at least 0.25 times the diameter of the D reference circle, which shall surround the FATO and the obstacle-free sector, at a height of 0.05 times the diameter of the reference circle, which no object shall penetrate.

Winching areas

4.2.25 An area designated for winching onboard ships shall comprise 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 4-13)

4.2.26 The manoeuvring zone shall comprise of 2 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 of not less than 2D.

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

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

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

Editorial Note.— Replace Figure 4-2 with a new Figure as follows:

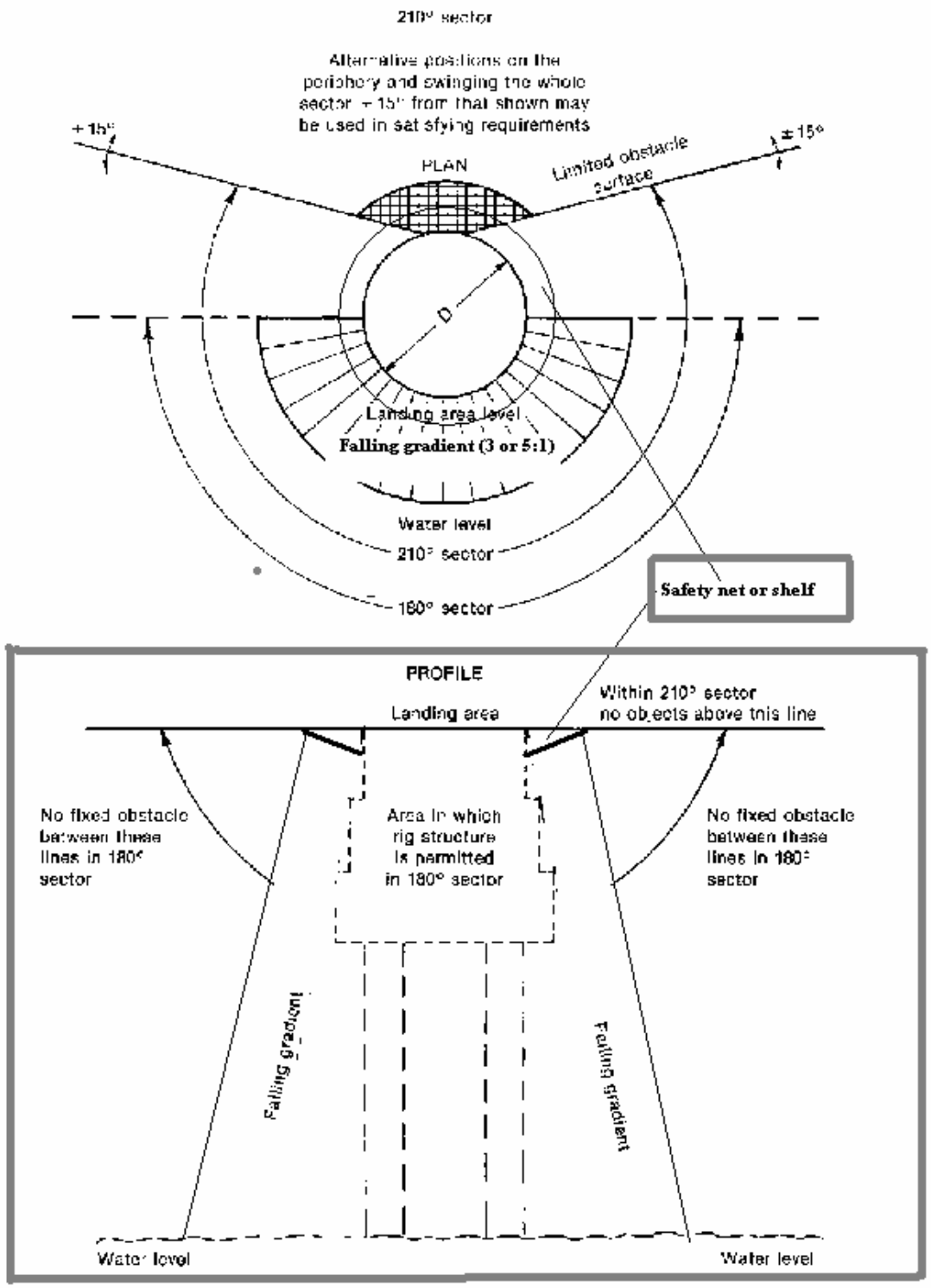

Figure 4-2. Helideck obstacle-free sector

Editorial Note.—Revise title of Figure 4-3 as follows: Figure 4-3. Helideck obstacle limitation sectors.

Editorial Note.— Delete existing Figures 4-4 and 4-5 and renumber remaining figures accordingly.

Editorial Note.— Insert new Figure 4-13 as follows.

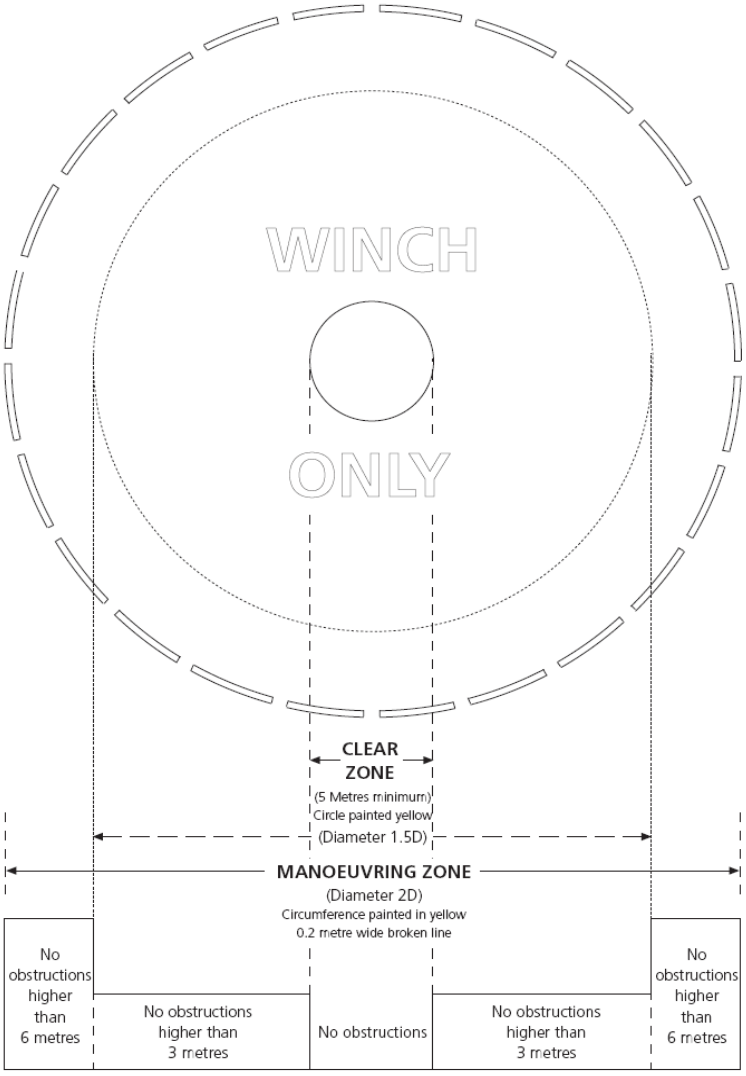

Figure 4-13. Winching area of a ship.

CHAPTER 5. VISUAL AIDS

5.1 Indicators

5.1.1 Wind direction indicators

Application

5.1.1.1 A heliport shall be equipped with at least one wind direction indicator.

Location

5.1.1.2 A wind direction indicator shall be located so as to indicate the wind conditions over the ~~final approach and take- off area~~ FATO and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It shall be visible from a helicopter in flight, in a hover or on the movement area.

5.1.1.3 **Recommendation.—** *Where a ~~touchdown and lift-off area~~ TLOF may be subject to a disturbed air flow, then additional wind direction indicators located close to the area should be provided to indicate the surface wind on the area.*

Note.— Guidance on the location of wind direction indicators is given in the Heliport Manual.

5.2 Markings and markers

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

5.2.1 Winching area marking

Application

~~5.2.1.1 **Recommendation.** — *A winching area marking should be provided at a winching area.*~~

5.2.1.1 Winching area markings shall be provided at a designated winching area (see Figure 4-13).

Location

5.2.1.2 ~~A w~~Winching area markings shall be located so that ~~its~~ their centre(s) coincides with the centre of the clear zone of the winching area~~(s)~~.

Characteristics

5.2.1.3 Winching area markings shall comprise of a winching area clear zone marking and a winching area manoeuvring zone marking.

5.2.1.~~3~~ 4 A winching area clear zone marking shall consist of a solid circle of not less than 5 m in diameter and ~~painted yellow~~ of a conspicuous colour.

5.2.1.5 A winching circle maneuvering zone shall consist of a broken circle of line of 0.2 m in width and of a diameter not less than 2 D and be marked in a conspicuous colour. Within it "WINCH ONLY" shall be marked to be easily visible to the pilot.

5.2.2 Heliport identification marking

Application

5.2.2.1 A heliport identification marking shall be provided at a heliport.

. . .

Characteristics

5.2.2.3 A heliport identification marking, except for a heliport at a hospital, shall consist of a letter H, white in colour. The dimensions of the marking shall be no less than those shown in Figure 5-1 and where the marking is used in conjunction with the ~~final approach and take-off area~~ FATO designation marking specified in 5.2.5, its dimensions shall be increased by a factor of 3.

~~*Note.— On a helideck covered with a rope netting, it may be advantageous to increase the height of the marking to 4 m and the other dimensions proportionally.*~~

5.2.2.4 A heliport identification marking for a heliport at a hospital shall consist of a letter H, red in colour, on a white cross made of squares adjacent to each of the sides of a square containing the H as shown in Figure 5-1.

5.2.2.5 A heliport identification marking shall be oriented with the cross arm of the H at right angles to the preferred final approach direction. For a helideck the cross arm shall be on or parallel to the bisector of the obstacle-free sector as shown in Figure 5-1.

5.2.2.6 **Recommendation.—** *On a helideck, the size of the heliport identification 'H' marking should have a height of 4 m with an overall width not exceeding 3 m and a stroke width not exceeding 0.75 m.*

5.2.3 Maximum allowable mass marking

Characteristics

. . .

5.2.3.3 A maximum allowable mass marking shall consist of a one, two-or a three-digit number. ~~followed by a letter "t" to indicate the allowable helicopter mass in tonnes (1 000 kg).~~ The marking shall be expressed in tonnes (1 000 kg) rounded to the nearest 1 000 kg followed by a letter "t". Where States use mass in pounds, the maximum allowable mass marking shall indicate the allowable helicopter mass in thousands of pounds rounded to the nearest 1 000 lbs.

Note.—Where States express the maximum allowable mass in pounds it is not appropriate to suffix with the letter "t" which is used only to indicate metric tonnes. Guidance on markings where States use imperial units is given in the Heliport Manual.

5.2.3.4 **Recommendation.—** The allowable mass marking should be expressed to the nearest 100 kg. The marking should be presented to one decimal place and rounded to the nearest 100 kg followed by the letter "t". Where States use mass in pounds, the maximum allowable mass marking should indicate the allowable helicopter mass in hundreds of pounds rounded to the nearest 100 lbs.

5.2.3.5 **Recommendation.—** *The numbers and the letter of the marking should have a colour contrasting with the background and should be in the form and proportion shown in Figure 5-2. ~~except that where space is limited, such as on an offshore helideck or shipboard heliport, it may be necessary to reduce the size of the marking to characters with an overall height of not less than 90 cm with a corresponding reduction in the width and thickness of the figures.~~*

Editorial Note.— Insert new Section 5.2.4 following existing Section 5.2.3. Renumber remaining Sections accordingly.

5.2.4 Maximum allowable D-value marking

Application

5.2.4.1 **Recommendation.—** *The D-value marking should be displayed at an elevated heliport and at a helideck.*

Location

5.2.4.2 **Recommendation.—** *A maximum allowable D-value marking should be located within the FATO and so arranged as to be readable from the preferred final approach direction.*

Characteristics

5.2.4.3 The D-value shall be marked on the FATO in a contrasting colour to it, preferably white. The D-value shall be rounded to the nearest whole number with 0.5 rounded down. e.g. 19.5 becomes 19 and 19.6 becomes 20.

. . .

5.2.~~7~~8 Touchdown and lift-off area marking

Application

~~5.2.7.1 A touchdown and lift-off area marking shall be provided on a helideck.~~

5.2.~~7~~8.~~2~~1 **~~Recommendation.~~** ~~A touchdown and lift-off area~~ TLOF marking ~~should~~ shall be provided on a heliport ~~other than a helideck~~ if the perimeter of the ~~touchdown and lift-off area~~ TLOF is not self-evident.

Location

5.2.~~7~~8.~~3~~2 The ~~touchdown and lift-off area~~ TLOF marking shall be located along the perimeter of the ~~touchdown and lift-off area~~ TLOF.

Characteristics

5.2.~~7~~8.~~4~~3 A ~~touchdown and lift-off area~~ TLOF marking shall consist of a continuous white line with a width of at least 30 cm.

5.2.~~8~~9 Touchdown/Positioning marking

Application

5.2.~~8~~9.1 **~~Recommendation.~~** A ~~a~~ touchdown/positioning marking ~~should~~ shall be provided where it is necessary for a helicopter to touch down or be accurately placed in a specific position.

Location

5.2.~~8~~9.~~2~~2 A touchdown/positioning marking shall be located so that when ~~a helicopter for which the marking is intended is positioned, with the main undercarriage inside the marking and the pilot situated over the marking,~~ the pilot's seat is over the marking, the undercarriage will be inside the load bearing area and all parts of the helicopter will be clear of any obstacle by a safe margin.

5.2.~~8~~9.~~3~~3 On a helideck ~~or on an elevated heliport~~ the centre of the touchdown marking shall be located at the centre of the ~~touchdown and lift-off area~~ FATO except that the marking may be offset away from the origin of the obstacle-free sector by no more than 0.1 D where an aeronautical study indicates such offsetting to be necessary and that a marking so offset would not adversely affect the safety.

Note.— It is not considered appropriate to offset a touchdown marking on a heliport located on the bow of a vessel, or for any helideck where the D-value is 16 m or less.

Characteristics

5.2.~~8~~9.~~4~~4 A touchdown/positioning marking shall be a yellow circle and have a line width of at least 0.5 m. For a helideck, the line width shall be at least 1 m.

5.2.~~8~~9.~~5~~5 ~~On helidecks~~ tThe inner diameter of the circle shall be ~~half the~~ 0.5 D ~~value~~ of the largest helicopter the ~~helideck~~ TLOF is intended to serve. ~~or 6 m whichever is the greater.~~

5.2.9.6 When a net is located on the surface of a FATO, it shall be large enough to cover the whole of the touchdown/positioning marking and shall not obscure other essential markings.

5.2.~~9~~10 Heliport name marking

Editorial Note.— Re-number existing paragraphs accordingly.

5.2.~~10~~11 Helideck obstacle-free sector marking

Application

5.2.~~10~~11.1 **Recommendation.—** *A helideck obstacle-free sector marking should be provided at a helideck.*

Location

5.2.~~10~~11.2 A helideck obstacle-free sector marking shall be located on the FATO perimeter or on the ~~touchdown and lift-off area~~ TLOF marking.

Characteristics

5.2.~~10~~11.3 The helideck obstacle-free sector marking shall indicate the origin of the obstacle free sector~~,~~ and the directions of the limits of the sector. ~~and the D value of the helideck as shown in Figure 5-5 for a hexagonal-shaped helideck.~~

Note— Example figures are given in the Heliport Manual.

~~*Note.— D is the largest dimension of the helicopter when the rotors are turning.*~~

5.2.~~10~~11.4 The height of the chevron shall equal the width of the touchdown and lift-off area marking but shall be not less than 30 cm.

5.2.~~10~~11.5 The chevron shall be ~~black~~ marked in a conspicuous colour.

Editorial Note.— Insert new Sections 5.2.12 and 5.2.13 and renumber remaining Sections accordingly.

5.2.12 Helideck surface marking

Characteristics

5.2.12.1 **Recommendation.—** *The helideck surface, bounded by the FATO should be of a dark colour using a high friction coating. Where the surface coating may have a degrading effect on friction qualities it may be necessary to leave the helideck surface untreated. In such cases, the conspicuity of the markings should be enhanced by outlining the deck markings with a contrasting colour.*

5.2.13 Helideck prohibited landing sector marking

Application

5.2.13.1 **Recommendation.—** *Helideck prohibited landing sector marking should be provided where it is necessary to prevent the helicopter from landing within specified headings.*

Location

5.2.13.2 **Recommendation.—** *The prohibited landing sector markings should be located on the touchdown/positioning marking to the edge of the FATO ,within the relevant headings as shown in Figur**e** 5-5.*

Characteristics

5.2.13.3 The prohibited landing sector markings shall be indicated by white and red hatched markings as shown in Figure 5.5.

Editorial Note.— Delete existing Figure 5-5 and insert new Figure 5-5 as follows.

Figure 5-5 Helideck prohibited landing sector marking

— END —