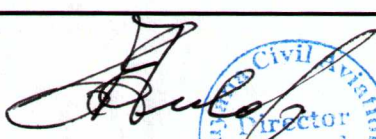




**GUYANA CIVIL AVIATION AUTHORITY**

**GUYANA AVIATION STANDARDS AND  
RECOMMENDATIONS FOR LICENSED  
(DOMESTIC) HELIPORT**

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## FOREWORD

Pursuant to Regulation 73 of the Civil Aviation (Air Navigations) Regulations, the Guyana Civil Aviation Authority (the Authority) has developed "**Standards and Recommendations**" for the licensing of Category D Aerodromes (Heliports/Helidecks/Helipads) established and operating within the territory of Guyana.

These Standards and Recommendations are intended to meet the basic requirements of the International Civil Aviation Organisation Annex 14 for the licensing of Heliports/Helidecks/Helipads in Guyana.

This publication therefore, gives guidance on the criteria required by the Authority in assessment of the standard of helicopter landing areas within Guyana's territory and used by both Guyana and foreign registered helicopters. These landing areas may be located onshore or offshore on:

1. Land;
2. Fixed offshore installations;
3. Mobile offshore installations;
4. Vessels supporting offshore mineral exploitation; or
5. Other vessels.

Domestic heliports fall into two general categories, Government and Privately owned. The Standards and Recommendations described herewith are therefore minimum Standards and Recommendations applicable in respect of the Heliports/Helidecks/Helipads physical characteristics and prohibitions.

The upkeep, maintenance, safety and operation of domestic Heliports/Helidecks/Helipads are the responsibility of the Operators. The Authority shall exercise its discretion when licensing Heliports/Helidecks/Helipads to ensure that at least minimum Standards are met. In doing so the Authority shall take into consideration, the benefits Heliports/Helidecks/Helipads will bring to the country without sacrificing safety. It is paramount that Helicopter Operators using these facilities be cautious and exercise extreme safety when flying into and departing these facilities.

In this publication the term "heliport" refers to all helicopter takeoff and landing areas on fixed and mobile installations and vessels unless specifically differentiated. The term "***offshore***" is used to differentiate from "***onshore***" (land-based).

  
Lt. Col. (Ret'd) Egbert Field, A.A.  
**Director General Civil Aviation**







**GUYANA CIVIL AVIATION AUTHORITY**  
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GCAA/SRPLH/2019-001

## LIST OF EFFECTIVE PAGES

PAGE NUMBER	REVISION NUMBER	EFFECTIVE DATE	PAGE NUMBER	REVISION NUMBER	EFFECTIVE DATE
1	Original	August 1, 2019	46	Original	August 1, 2019
2	Original	August 1, 2019	47	Original	August 1, 2019
3	Original	August 1, 2019	48	Original	August 1, 2019
4	Original	August 1, 2019	49	Original	August 1, 2019
5	Original	August 1, 2019	50	Original	August 1, 2019
6	Original	August 1, 2019	51	Original	August 1, 2019
7	Original	August 1, 2019	52	Original	August 1, 2019
8	Original	August 1, 2019	53	Original	August 1, 2019
9	Original	August 1, 2019	54	Original	August 1, 2019
10	Original	August 1, 2019	55	Original	August 1, 2019
11	Original	August 1, 2019	56	Original	August 1, 2019
12	Original	August 1, 2019	57	Original	August 1, 2019
13	Original	August 1, 2019	58	Original	August 1, 2019
14	Original	August 1, 2019	59	Original	August 1, 2019
15	Original	August 1, 2019	60	Original	August 1, 2019
16	Original	August 1, 2019	61	Original	August 1, 2019
17	Original	August 1, 2019	62	Original	August 1, 2019
18	Original	August 1, 2019	63	Original	August 1, 2019
19	Original	August 1, 2019	64	Original	August 1, 2019
20	Original	August 1, 2019	65	Original	August 1, 2019
21	Original	August 1, 2019	66	Original	August 1, 2019
22	Original	August 1, 2019	67	Original	August 1, 2019
23	Original	August 1, 2019	68	Original	August 1, 2019
24	Original	August 1, 2019	69	Original	August 1, 2019
25	Original	August 1, 2019	70	Original	August 1, 2019
26	Original	August 1, 2019	71	Original	August 1, 2019
27	Original	August 1, 2019	72	Original	August 1, 2019
28	Original	August 1, 2019	73	Original	August 1, 2019
29	Original	August 1, 2019	74	Original	August 1, 2019
30	Original	August 1, 2019	75	Original	August 1, 2019
31	Original	August 1, 2019	76	Original	August 1, 2019
32	Original	August 1, 2019	77	Original	August 1, 2019
33	Original	August 1, 2019	78	Original	August 1, 2019
34	Original	August 1, 2019	79	Original	August 1, 2019
35	Original	August 1, 2019	80	Original	August 1, 2019
36	Original	August 1, 2019	81	Original	August 1, 2019
37	Original	August 1, 2019	82	Original	August 1, 2019
38	Original	August 1, 2019	83	Original	August 1, 2019
39	Original	August 1, 2019	84	Original	August 1, 2019
40	Original	August 1, 2019	85	Original	August 1, 2019
41	Original	August 1, 2019	86	Original	August 1, 2019
42	Original	August 1, 2019	87	Original	August 1, 2019
43	Original	August 1, 2019	88	Original	August 1, 2019
44	Original	August 1, 2019	89	Original	August 1, 2019
45	Original	August 1, 2019			





## TABLE OF CONTENTS

SUBJECT	PAGE
FOREWORD .....	1
LIST OF EFFECTIVE PAGES .....	2
RECORDS OF AMENDMENTS .....	3
TABLE OF CONTENTS .....	4
CHAPTER: 1 - GENERAL REQUIREMENTS .....	6
CHAPTER: 2 - LICENSING POLICIES .....	9
2.1 Licensing of Heliport .....	9
2.2 Pre-Licensing – The Application Process .....	9
2.3 Post Licensing .....	9
CHAPTER: 3 HELIPORT DATA .....	11
3.1 Aeronautical Data .....	11
3.2 Heliport Reference Point .....	11
3.3 Heliport Elevations .....	11
3.4 Heliport Dimensions and Related Information .....	11
3.5 Declared Distances .....	12
3.6 Coordination Between AIS and Heliport Authorities .....	12
CHAPTER: 4 PHYSICAL CHARACTERISTICS .....	14
4.1 Surface-Level Heliports .....	14
4.2 Helicopter Clearways .....	15
4.3 Touchdown and Lift-Off Areas .....	16
4.4 Safety Areas .....	17
4.5 Helicopter Ground Taxiways and Helicopter Ground Taxi-Routes .....	17
4.6 Helicopter Air Taxiways and Helicopter Air Taxi-Routes .....	19
4.7 Helicopter Stands .....	20
4.8 Location of a Final Approach and Take-Off Area in Relation to a Runway or Taxiway .....	22
4.9 Location of a Final Approach and Take-Off Area in Relation to a Runway or Taxiway .....	23
4.10 Elevated Heliports .....	24
4.11 Helicopter Clearways .....	25
4.12 Touchdown and Lift-Off Areas .....	25
4.13 Safety Areas .....	26
4.14 Helicopter Ground Taxiways and Ground Taxi-Routes .....	27
4.15 Helicopter Air Taxiways and Air Taxi-Routes .....	27
4.16 Aprons .....	28
4.17 Helidecks .....	29
4.18 Shipboard Heliports .....	30



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

<b>SUBJECT</b>	<b>PAGE</b>
<b>CHAPTER: 5 OBSTACLE ENVIRONMENT</b> .....	34
5.1 Obstacle Limitation Surfaces and Sectors .....	34
5.2 Transitional Surface .....	39
5.3 Take-Off Climb Surface .....	40
5.4 Obstacle-Free Sector/Surface - Helidecks .....	41
5.5 Limited Obstacle Sector/Surface - Helidecks .....	41
5.6 Helidecks .....	46
5.7 Shipboard Heliports .....	47
5.8 Winching Areas .....	48
<b>CHAPTER: 6 VISUAL AIDS</b> .....	50
6.1 Indicators .....	51
6.2 Markings and Markers .....	51
6.3 Lights .....	65
<b>APPENDIX: 1 - Aerodrome Application Form</b> .....	78
<b>APPENDIX: 2 - Heliport/Helideck Initial and Periodic Inspection Checklist</b> .....	80
<b>APPENDIX: 3 - Heliport/Helideck Periodic Inspection Checklist</b> .....	81
<b>APPENDIX: 4 - Offshore Helideck Inspection Checklist</b> .....	82
<b>APPENDIX: 5 - Sample Licence &amp; Ops Specs (Heliport/Helideck)</b> .....	88



## CHAPTER: 1 GENERAL REQUIREMENTS

- CITATION:** 1. The Standards and Recommended Practices contained herein may be cited as the Standards and Recommended Practices acceptable to the Guyana Civil Aviation Authority (referred to as the GCAA or the Authority) regarding the licensing of Heliports in Guyana.
- APPLICATIONS:** 2. These Standards and Recommended Practices are applicable to all Category "D" Domestic Heliports and Helidecks, except international and military Heliports and Helidecks.
- INTERPRETATION:** 3. In this publication, the following **Terms** and **Abbreviations** shall mean:
- a) **Aerodrome Operator** - means the holder of an Aerodrome Licence issued pursuant to Regulation 73 of the Guyana Civil Aviation (Air Navigation) Regulation 2001.
  - b) **Aiming Circle** – Also referred to as "landing circle" or "touch down marking"; is the aiming point for normal landing, so designed that the pilot's seat can be placed directly above it in any direction with assured main and tail rotor clearances.
  - c) **D-Value** - The largest overall dimension of the helicopter when rotors are turning. This dimension will normally be 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 the most rearward extension of the fuselage in the case of Fenestron or Notar tails).
  - d) **D-Circle** - A circle, usually imaginary unless the helideck itself is circular, the diameter of which is the D-Value of the largest helicopter the helideck is intended to serve.
  - e) **FOD** - Foreign object debris or foreign object damage.
  - f) **Helideck** - A landing area on a vessel or offshore structure on which helicopters may land and take off.
  - g) **Helipad** - A small, designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters. In other words, the TLOF (not to be confused with heliport or helistop).
  - h) **Heliport** - A heliport is an area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters, and includes its buildings and facilities (if any).
  - i) **Heliport Licence** – means a licence issued by the appropriate authority under applicable regulations for the operation of a heliport.



- j) **Heliport Licence** – means a licence issued by the appropriate authority under applicable regulations for the operation of a heliport. *"In our case, a licence issued by the Guyana Civil Aviation Authority for the operation of a Heliport".*
- k) **Heliport Operating Staff** - means all persons, whether or not employed by the heliport licence holder, whose duties are concerned either with ensuring that the heliport and airspace within which its visual traffic pattern is normally contained are safe for use by aircraft (helicopters/rotorcrafts), or whose duties require them to have access to the heliport manoeuvring area or apron.
- l) **Helistop** - A term sometimes used to describe a minimally developed heliport for boarding and discharging passengers or cargo.
- m) **ICAO** - International Civil Aviation Organization.
- n) **Landing Area** - A generic term referring to any area primarily intended for the landing or take-off of aircraft.
- o) **Licensed Heliport** – means a heliport whose operator has been granted a heliport Licence.
- p) **LOS** - Limited Obstacle sector. The 150° sector within which obstacles may be permitted, provided the height of the obstacles is limited.
- q) **NAI** - Normally Attended Installation.
- r) **NUI** - Normally Unattended Installation.
- s) **OFS** - Obstacle Free Sector. The 210° sector, extending outwards to a distance of 1000 metres within which no obstacles above helideck level are permitted.
- t) **Perimeter D Marking** - The marking in the perimeter line in whole numbers; i.e. the D-Value (see above) rounded up or down to the nearest whole number.
- u) **Run-Off Area** - An extension to the Landing Area designed to accommodate a parked helicopter.
- v) **SLA** - Safe Landing Area. *(The area bounded by the perimeter line and perimeter lighting. N.B. The construction of the OFS and LOS segments (see below) should ensure that the main rotor will not risk conflict with obstacles when the nose of the helicopter is butted-up to, but not projecting over, the perimeter line. Thus the pilot, when landing in unusual circumstances, has confidence that he can touch down provided that all wheels are within the SLA and the nose of the helicopter is not projecting over the nearest perimeter line ahead. It must be noted, however, that only correct positioning over the aiming circle (see "Aiming Circle" above) will ensure proper clearance with respect to physical obstacles and provision of ground effect and provision of adequate passenger access/egress).*





**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

**INSPECTION:**

4. The operator of a heliport shall, without charge, at the request of the Authority, allow the inspector of the Authority access to the heliport facilities and provide all assistance necessary for the conduct of the inspection of the Heliport or Helideck.

**LICENSING:**

5. The operator of a heliport applying for a licence to operate, annotated in the Aeronautical Information Publication (AIP) shall provide to the Director General Guyana Civil Aviation Authority (referred to as the Director General or DG), in writing information required for listing and describing the heliport in the AIP. The Director General shall license the heliport and publish the information in the AIP.

**REFUSAL OF  
REGISTRATION:**

6. The Director General may refuse to license a heliport:
  - a) where the heliport does not have any or one of the following onsite facilities or services for aviation operations in support of commercial activities, such as:
    - i. sale of aircraft fuel;
    - ii. aircraft maintenance;
  - b) If the heliport is located in a remote area and is deemed by the Director General or his representative not in the interest of public safety;
  - c) the operator of the aerodrome does not meet the requirements of chapter (3) to (6) of this document.
  - d) the heliport does not meet the licensed aerodrome standards; or
  - e) using the heliport is likely to be hazardous to aviation safety, and, in such a case shall not publish information with respect to that aerodrome.



## CHAPTER: 2 LICENSING POLICIES

### 2.1 LICENSING OF HELIPORT

**Note:** All heliports established in Guyana's territory must be licensed by the Guyana Civil Aviation Authority before it can begin its operation. Operation without the requisite licence shall deem the heliport operation illegal and in contravention of the civil aviation regulations and the Authority may take enforcement action, as necessary.

- 2.1.1 If the owner/operator of the heliport is the Government of Guyana, then the Aerodromes Section of the Ministry of Public Infrastructure (MOPI) shall ensure that it is satisfied that the heliport is safe for aircraft operations. When satisfied, the Aerodromes Section of the MOPI shall submit to the Authority, all relevant information pertaining to the operational status and serviceability of the heliport. This will allow the Authority to make the appropriate documentation, listing and notification of the heliport, as necessary.
- 2.1.2 Regarding private heliports, the Aerodromes Section of the MOPI or the owner/operator of the heliport, as applicable, shall notify the Authority that the heliport has met the requirements of the Authority and is safe for aircraft operations. The Aerodromes Section of the MOPI shall also advise the owner/operator of the heliport to apply to the Authority for an aerodrome Licence.

### 2.2 PRE-LICENSING – THE APPLICATION PROCESS

- 2.2.1 The prospective applicant for a heliport licence shall submit to the Authority the following:
- a) An application form (see Appendix: A) with the nonrefundable fee specified by the Authority;
  - b) A heliport plans; and
  - c) A self-assessment report showing that the applicant is satisfied that the heliport was inspected and meet all the technical standards required in accordance with the checklists contained in Appendices C and D.
- 2.2.2 The Authority shall:
- a) Review the application and the applicant's self-assessment to ensure it meets the requirements of the Standards and Recommended Practices and all GCAA requirements;
  - b) Ensure that the nonrefundable fee is paid; and
  - c) Carry out an inspection(s) of the heliport and its facilities and the expenses shall be borne by the applicant. The expenses shall include transportation (air and other), boarding and lodging, per diem and any other contingency costs associated with the inspection.



## 2.3 POST LICENSING

- 2.3.1 After the heliport licence is issued, the applicant (owner/operator) shall submit a copy of the licence to the following Government Agencies:
- a) The Ministry of Public Infrastructure - Aerodromes Section;
  - b) The Ministry of Home Affairs;
  - c) The Guyana Police Force;
  - d) The Guyana Defence Force; and
  - e) The Director Air Navigation Service (Guyana Civil Aviation Authority).
- 2.3.2 The owner/operator shall maintain the aerodrome in accordance with conditions existing at time of licensing.
- 2.3.3 The (owner/operator) shall ensure that the Authority is given access to the heliport to carry out its safety surveillance, including, routine annual inspection and other non-routine (ad-hoc/spot) inspections.
- 2.3.4 Any modification or alteration of the heliport, including any upgrade, must be submitted to the Aerodromes Section of the MOPI for approval and once approved by the MOPI, the owner/operator shall notify the Authority, in writing.
- 2.3.5 Owner/operator shall submit a status report of the heliport to the MOPI and the Authority on an annual basis.
- 2.3.6 The owner/operator of the heliport shall be responsible for ensuring that any significant changes being made in the vicinity of the heliport, on land not controlled by him/her, is notified to the MOPI and the Authority. Significant changes include, erection of tall buildings, masts and antennas, use of cranes, etc., which are likely to affect safety of aircraft operations at the heliport.
- 2.3.7 No new construction changes of any physical infrastructure especially, buildings shall be done without prior approval of the MOPI and once approved, the Authority shall be notified.

**Note:** These requirements can also be found on the heliport licence (see Appendix B.)



## CHAPTER: 3 HELIPORT DATA

### 3.1 AERONAUTICAL DATA

- 3.1.1 Determination and reporting of heliport-related aeronautical data shall be in accordance with the accuracy and integrity Classification required to meet the needs of the end-user of aeronautical data.
- 3.1.2 Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

### 3.2 HELIPORT REFERENCE POINT

- 3.2.1 A heliport reference point shall be established for a heliport or a landing location not collocated with an aerodrome.

***Note:** When the heliport or landing location is collocated with an aerodrome, the established aerodrome reference point serves both the aerodrome and the heliport or the landing location.*

- 3.2.2 The heliport reference point shall be located near the initial or planned geometric centre of the heliport or landing location and shall normally remain where first established. The position of the heliport reference point shall be measured and reported in degrees, minutes and seconds to the Aeronautical Information Services (AIS) of the Air Navigation Services Directorate of the GCAA.

### 3.3 HELIPORT ELEVATIONS

- 3.3.1 The heliport elevation and geoid undulation at the heliport elevation position shall be measured and reported to the AIS and shall be to the accuracy of one-half metre or foot.
- 3.3.2 The elevation of the Touchdown and Liftoff (TLOF) area and/or the elevation and geoid undulation of each threshold of the Final Approach and Takeoff (FATO) area where appropriate shall be measured and reported to the AIS and shall be to the accuracy of one-half metre or foot.

***Note:** Geoid undulation must be measured in accordance with the appropriate system of coordinates.*

### 3.4 HELIPORT DIMENSIONS AND RELATED INFORMATION

- 3.4.1 The following data shall be measured or described, as appropriate, for each facility provided on a heliport:
- a) **Heliport Type** — surface-level, elevation, shipboard or helideck;
  - b) **Touchdown and Liftoff (TLOF) Area** — dimensions to the nearest metre or foot, slope, surface type, bearing strength in tonnes (1 000 kg);
  - c) **Final Approach and Takeoff (FATO) Area** — type of FATO, true bearing to one-hundredth of a degree, designation number (where appropriate), length and width to the nearest metre or foot, slope, surface type;



- d) **Safety Area** — length, width and surface type;
- e) **Helicopter Ground Taxiway and Helicopter Air Taxiway** — designation, width, surface type;
- f) **Apron** — surface type, helicopter stands;
- g) **Clearway** — length, ground profile; and
- h) **Visual Aids** — for approach procedures, marking and lighting of FATO, TLOF, helicopter ground taxiways, helicopter air taxiways and helicopter stands.

3.4.2 The geographical coordinates of the geometric centre of the TLOF and/or of each threshold of the FATO, where appropriate, shall be measured and reported to the AIS in degrees, minutes, seconds and hundredths of seconds.

3.4.3 The geographical coordinates of appropriate centre line points of helicopter ground taxiways and helicopter air taxiways shall be measured and reported to the AIS in degrees, minutes, seconds and hundredths of seconds.

3.4.4 The geographical coordinates of each helicopter stand shall be measured and reported to the AIS in degrees, minutes, seconds and hundredths of seconds.

3.4.5 The geographical coordinates of obstacles in Area 2 (the part within the heliport boundary) and in Area 3 shall be measured and reported to the AIS in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation, type, marking and lighting (if any) of obstacles shall be reported to the AIS.

### 3.5 DECLARED DISTANCES

3.5.1 The following distances to the nearest metre or foot shall be declared, where relevant, for a heliport:

- a) take-off distance available;
- b) rejected take-off distance available; and
- c) landing distance available.

### 3.6 COORDINATION BETWEEN AIS AND HELIPORT AUTHORITIES

3.6.1 To ensure that the AIS obtain information to enable it to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between the AIS and the heliport authorities responsible for heliport services to report to the AIS, expeditiously and with minimum delay:

- a) information on heliport conditions;
- b) the operational status of associated facilities, services and navigation aids within its area of responsibility; and
- c) any other information considered to be of operational significance.





**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

---

DOC. #:  
GCAA/SRPLH/2019-001

- 3.6.2** Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by the AIS for the preparation, production and issue of relevant material for promulgation. To ensure timely provision of the information to the AIS, close coordination between those services concerned is therefore required.
- 3.6.3** Of particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the Aeronautical Information Regulation and Control (AIRAC) system, as specified in ICAO Annex 15, Chapter 6. The predetermined, internationally agreed AIRAC effective dates shall be observed by the responsible heliport services when submitting the raw information/data to the AIS.
- 3.6.4** The heliport services responsible for the provision of raw aeronautical information/data to the AIS shall do that while taking into account accuracy and integrity requirements necessary to meet the needs of the end-user of aeronautical data.



## CHAPTER: 4 PHYSICAL CHARACTERISTICS

### 4.1 SURFACE-LEVEL HELIPORTS

**Note 1:** The provisions given in this section are based on the design assumption that no more than one helicopter will be in the FATO at the same time.

**Note 2:** The design provisions given in this section assume when conducting operations to a FATO in proximity to another FATO, these operations will not be simultaneous. If simultaneous helicopter operations are required, appropriate separation distances between FATOs need to be determined, giving due regard to such issues as rotor downwash and airspace, and ensuring the flight paths for each FATO, defined in Chapter 4, do not overlap.

**Note 3:** The specifications for ground taxi-routes and air taxi-routes are intended for the safety of simultaneous operations during the manoeuvring of helicopters. However, the wind velocity induced by the rotor downwash may have to be considered.

#### 4.1.1 FINAL APPROACH AND TAKE-OFF AREAS:

- a) A surface-level heliport shall be provided with at least one final approach and take-off area (FATO) (**Note: A FATO may be located on or near a runway strip or taxiway strip.**);
- b) A FATO shall be obstacle free; and
- c) The dimensions of a FATO shall be:
  - i. 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; or
  - ii. 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:
    - d) 1 D of the largest helicopter when the maximum take-off mass (MTOM) of helicopters the FATO is intended to serve is more than 3 175 kg; or
    - e) 0.83 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3 175 kg or less.

**Note:** The term FATO is not used in the HFM. The minimum landing/take-off area specified in the HFM for the appropriate Performance Class 1 flight profile is necessary to determine the size of the FATO. However, for vertical take-off procedures in Performance Class 1, the required rejected take-off area is not normally quoted in the HFM, and it will be necessary to obtain information which includes complete containment (this figure will always be greater than 1 D.)

#### 4.1.2 RECOMMENDATION -

- ##### 4.1.2.1
- Where intended to be used by helicopters operated in Performance Class 2 or 3 with MTOM of 3 175 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.



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

- a) *The FATO shall provide rapid drainage but the mean slope in any direction shall not exceed 3%. No portion of a FATO shall have a local slope exceeding:*
  - i. *5% where the heliport is intended to be used by helicopters operated in Performance Class 1; and*
  - ii. *7% where the heliport is intended to be used by helicopters operated in Performance Class 2 or 3.*
- b) *The surface of the FATO shall:*
  - i. *be resistant to the effects of rotor downwash;*
  - ii. *be free of irregularities that would adversely affect the take-off or landing of helicopters; and*
  - iii. *have bearing strength sufficient to accommodate a rejected take-off by helicopters operated in Performance Class 1.*
- c) *The surface of a FATO surrounding a touchdown and lift-off area intended for use by helicopters operated in Performance Classes 2 and 3 shall be static loadbearing.*

**4.1.3 RECOMMENDATION -**

**4.1.3.1** *The FATO should provide ground effect.*

**4.1.4 RECOMMENDATION -**

**4.1.4.1** *The FATO should be located so as to minimize the influence of the surrounding environment, including turbulence, which could have an adverse impact on helicopter operations.*

**Note:** *If turbulence mitigating design measures are warranted but not practical, operational limitations may need to be considered under certain wind conditions.*

**4.2 HELICOPTER CLEARWAYS**

**Note:** *A helicopter clearway needs to be considered when the heliport is intended to be used by helicopters operating in Performance Class 1.*

**4.2.1** When a helicopter clearway is provided, it shall be located beyond the end of the FATO.

**4.2.2 RECOMMENDATION -**

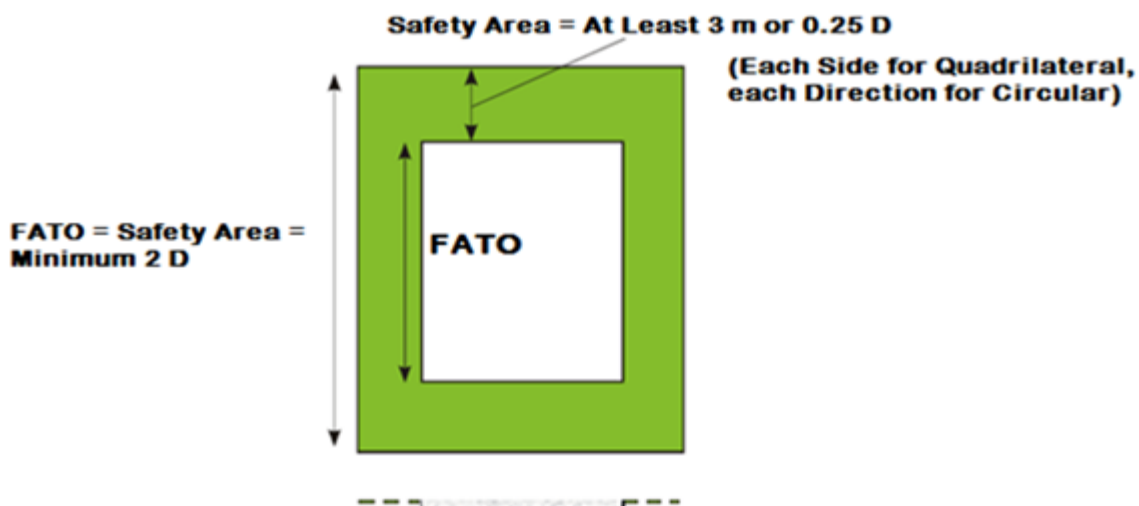
**4.2.2.1** *The width of a helicopter clearway should not be less than that of the associated safety area. (See Figure 4-1.)*

**4.2.3 RECOMMENDATION -**

**4.2.3.1** *The ground in a helicopter clearway should not project above a plane having an upward slope of 3%, the lower limit of this plane being a horizontal line which is located on the periphery of the FATO.*

**4.2.4 RECOMMENDATION -**

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



**FIGURE 4-1: FATO AND ASSOCIATED SAFETY AREA**

### 4.3 TOUCHDOWN AND LIFT-OFF AREAS

- 4.3.1 At least one TLOF shall be provided at a heliport.
- 4.3.2 One TLOF shall be located within the FATO or one or more TLOFs shall be collocated with helicopter stands. For runway-type FATOs, additional TLOFs located in the FATO are acceptable.
- 4.3.3 The TLOF shall be of sufficient size to contain a circle of diameter of at least 0.83 D of the largest helicopter the area is intended to serve.
- Note: A TLOF may be any shape.*
- 4.3.4 Slopes on a TLOF shall be sufficient to prevent accumulation of water on the surface of the area but shall not exceed 2% in any direction.
- 4.3.5 Where the TLOF is within the FATO, the TLOF shall be dynamic load-bearing.
- 4.3.6 Where a 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.
- 4.3.7 Where a TLOF is located within a FATO which can contain a circle of diameter more than 1 D, the centre of the TLOF shall be located not less than 0.5 D from the edge of the FATO.



#### 4.4 SAFETY AREAS

- 4.4.1 A FATO shall be surrounded by a safety area which need not be solid.
- 4.4.2 A safety area surrounding a FATO 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.
- 4.4.3 There shall be a protected side slope rising at 45 degrees from the edge of the safety area to a distance of 10 m, 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.
- Note: When only a single approach and take-off climb surface is provided, the need for specific protected side slopes would be addressed in the aeronautical study required in ICAO Annex 14, Vol. 2, Paragraph 4.2.7.*
- 4.4.4 No fixed object shall be permitted above the plane of the FATO on a safety area, except for **frangible objects**, which, because of their function, must be located in the area. No mobile object shall be permitted on a safety area during helicopter operations.
- 4.4.5 Objects whose function requires them to be located on the safety area shall not:
- a) if located at a distance of less than 0.75 D from the centre of the FATO, penetrate a plane at a height of 5 cm above the plane of the FATO; and
  - b) if located at a distance of 0.75 D or more from the centre of the FATO, penetrate a plane originating at a height of 25 cm above the plane of the FATO and sloping upwards and outwards at a gradient of 5%.
- 4.4.6 The surface of the safety area, when solid, shall not exceed an upward slope of 4% outwards from the edge of the FATO.
- 4.4.7 Where applicable, the surface of the safety area shall be treated to prevent flying debris caused by rotor downwash.
- 4.4.8 When solid, the surface of the safety area abutting the FATO shall be continuous with the FATO.

#### 4.5 HELICOPTER GROUND TAXIWAYS AND HELICOPTER GROUND TAXI-ROUTES

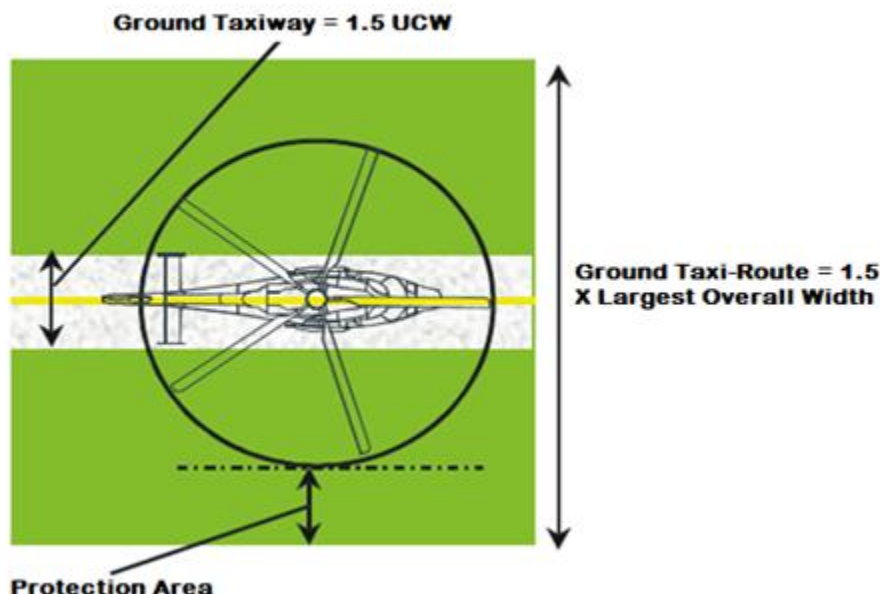
*Note 1: A helicopter ground taxiway is intended to permit the surface movement of a wheeled helicopter under its own power.*

*Note 2: When a taxiway is intended for use by aeroplanes and helicopters, the provisions for taxiways for aeroplanes and helicopters ground taxiways will be taken into consideration and the more stringent requirements will be applied.*

- 4.5.1 The width of a helicopter ground taxiway shall not be less than 1.5 times the largest width of the undercarriage (UCW) of the helicopters the helicopter ground taxiway is intended to serve.



- 4.5.2 The longitudinal slope of a helicopter ground taxiway shall not exceed 3%.



**FIGURE 4-2: HELICOPTER GROUND TAXI-ROUTE / TAXIWAY**

- 4.5.3 A helicopter ground taxiway shall be static load-bearing and be capable of withstanding the traffic of the helicopters the helicopter ground taxiway is intended to serve.
- 4.5.4 A helicopter ground taxiway shall be centred on a ground taxi-route.
- 4.5.5 A helicopter ground taxi-route shall extend symmetrically on each side of the centre line for at least 0.75 times the largest overall width of the helicopters it is intended to serve.
- Note:** The part of the helicopter ground taxi-route that extends symmetrically on each side of the centre line from 0.5 times the largest overall width of the helicopters it is intended to serve to the outermost limit of the helicopter ground taxi-route is its protection area.*
- 4.5.6 No fixed object shall be permitted above the surface of the ground on a helicopter ground taxi-route, except for **frangible objects**, which, because of their function, must be located thereon. No mobile object shall be permitted on a ground taxi-route during helicopter movements.
- 4.5.7 Objects whose function requires them to be located on a helicopter ground taxi-route shall not:
- a) be located at a distance of less than 50 cm from the edge of the helicopter ground taxiway; and
  - b) penetrate a plane originating at a height of 25 cm above the plane of the helicopter ground taxiway, at a distance of 50 cm from the edge of the helicopter ground taxiway and sloping upwards and outwards at a gradient of 5%.

**4.5.8** The helicopter ground taxiway and the helicopter ground taxi-route shall provide rapid drainage but the helicopter ground taxiway transverse slope shall not exceed 2%.

**4.5.9** The surface of a helicopter ground taxi-route shall be resistant to the effect of rotor downwash. For simultaneous operations, the helicopter ground taxi-routes shall not overlap.

#### **4.6 HELICOPTER AIR TAXIWAYS AND HELICOPTER AIR TAXI-ROUTES**

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

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

##### **4.6.2 RECOMMENDATION -**

**4.6.2.1** The surface of a helicopter air taxiway should be static loadbearing.

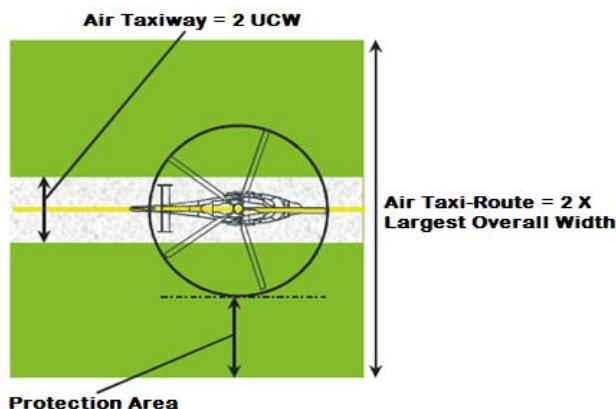
##### **4.6.3 RECOMMENDATION -**

**4.6.3.1** The slopes of the surface of a helicopter air taxiway should not exceed the slope landing limitations of the helicopters the helicopter air taxiway is intended to serve. In any event the transverse slope should not exceed 10% and the longitudinal slope should not exceed 7%.

**4.6.3.2** A helicopter air taxiway shall be centred on an air taxi-route. A helicopter air taxi-route shall extend symmetrically on each side of the centre line for a distance at least equal to the largest overall width of the helicopters it is intended to serve.

**Note:** The part of the helicopter air taxi-route that extends symmetrically on each side of the centre line from 0.5 times the largest overall width of the helicopters it is intended to serve to the outermost limit of the helicopter air taxi-route is its protection area.

**4.6.3.3** No fixed object shall be permitted above the surface of the ground on an air taxi-route, except for frangible objects, which, because of their function, must be located thereon. No mobile object shall be permitted on an air taxi-route during helicopter movements.



**FIGURE 4-3: HELICOPTER AIR TAXI-ROUTE / TAXIWAY**



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

**4.6.3.4** *Objects above ground level whose function requires them to be located on a helicopter air taxi-route shall not:*

- a) be located at a distance of less than 1m from the edge of the helicopter air taxiway; and*
- b) penetrate a plane originating at a height of 25cm above the plane of the helicopter air taxiway, at a distance of 1 m from the edge of the helicopter air taxiway and sloping upwards and outwards at a gradient of 5%.*

**4.6.4** **RECOMMENDATION -**

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

- a) be located at a distance of less than 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centre line of the helicopter air taxiway; and*
- b) penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance of 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centre line of the helicopter air taxiway, and sloping upwards and outwards at a gradient of 5%.*

**4.6.4.2** *The surface of a helicopter air taxi-route shall be resistant to the effect of rotor downwash.*

**4.6.4.3** *The surface of a helicopter air taxi-route shall provide ground effect.*

**4.6.4.4** *For simultaneous operations, the helicopter air taxi-routes shall not overlap.*

**4.7** **HELICOPTER STANDS**

**Note:** *The provisions of this section do not specify the location for helicopter stands but allow a high degree of flexibility in the overall design of the heliport. However, it is not considered good practice to locate helicopter stands under a flight path.*

**4.7.1** When a TLOF is collocated with a helicopter stand, the protection area of the stand shall not overlap the protection area of any other helicopter stand or associated taxi route. The helicopter stand shall provide rapid drainage but the slope in any direction shall not exceed 2%.

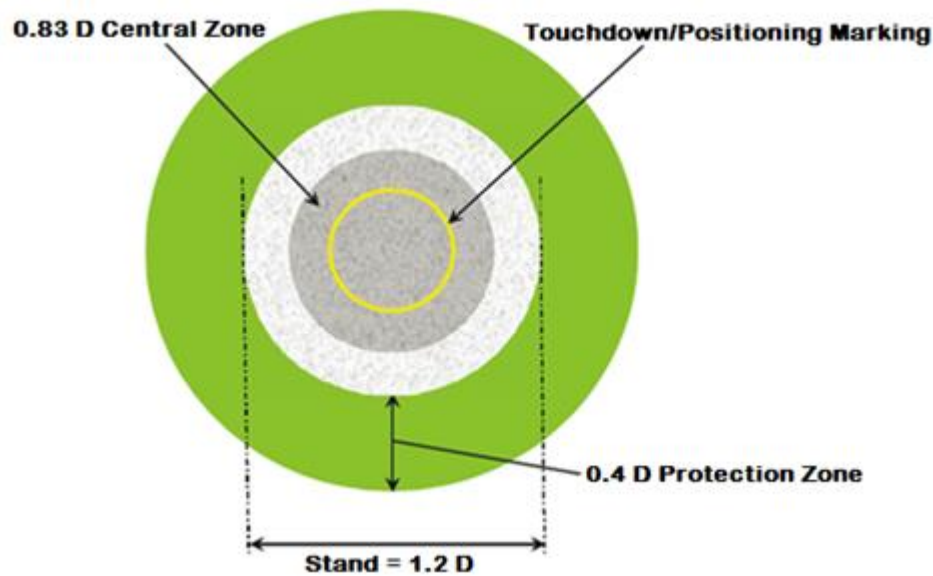
**Note:** *The requirements on the dimensions of helicopter stands assume the helicopter will turn in a hover when operating over a stand.*

**4.7.2** A helicopter stand intended to be used by helicopters turning in a hover shall be of sufficient size to contain a circle of diameter of at least 1.2 D of the largest helicopter the stand is intended to serve.

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

**4.7.4** Where a helicopter stand is intended to be used for turning, the minimum dimension of the stand and protection area shall be not less than 2 D.

**4.7.5** Where a helicopter stand is intended to be 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.



**FIGURE 4-4: HELICOPTER GROUND TAXI-ROUTE / TAXIWAY**

- 4.7.6** For simultaneous operations, the protection areas of helicopter stand and their associated taxi-routes shall not overlap.
- Note:** Where non-simultaneous operations are envisaged, the protection areas of helicopter stand and their associated taxi-routes may overlap.
- 4.7.7** A helicopter stand and associated protection area intended to be used for air taxiing shall provide ground effect.
- 4.7.8** No fixed object shall be permitted above the surface of the ground on a helicopter stand. No fixed object shall be permitted above the surface of the ground in the protection area around a helicopter stand except for frangible objects, which because of their function, must be located there.
- 4.7.9** No mobile object shall be permitted on a helicopter stand and the associated protection area during helicopter movements.
- 4.7.10** Objects whose function requires them to be located in the protection area shall not:
- if located at a distance of less than  $0.75 D$  from the centre of the helicopter stand, penetrate a plane at a height of 5 cm above the plane of the central zone; and
  - if located at a distance of  $0.75 D$  or more from the centre of the helicopter stand, penetrate a plane at a height of 25 cm above the plane of the central zone and sloping upwards and outwards at a gradient of 5%.

- 4.7.11** The central zone of a helicopter stand shall be capable of withstanding the traffic of helicopters 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 taxi-through, and where the helicopter using the stand is not required to turn, the same width as the helicopter ground taxiway.

***Note:** For a helicopter stand intended to be used for turning on the ground by wheeled helicopters, the dimension of the helicopter stand, including the dimension of the central zone, would need to be significantly increased.*

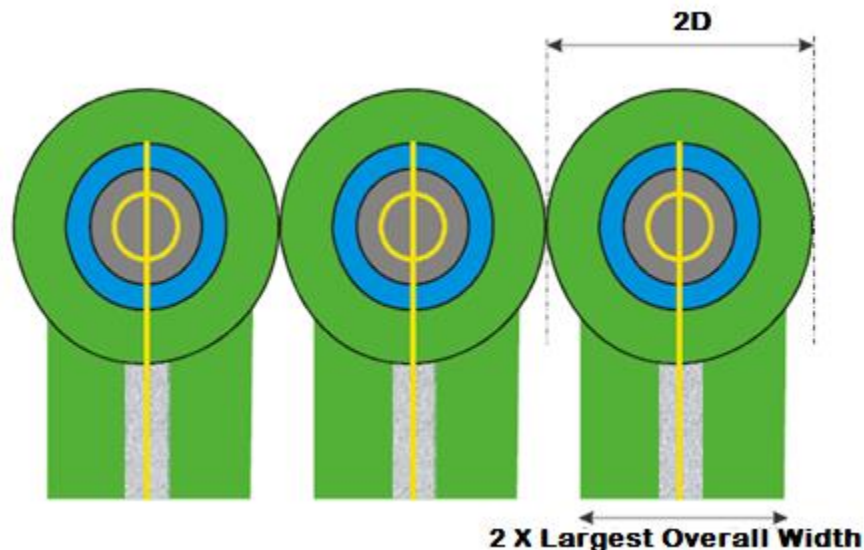
#### **4.8 LOCATION OF A FINAL APPROACH AND TAKE-OFF AREA IN RELATION TO A RUNWAY OR TAXIWAY**

- 4.8.1** Where a FATO is located near a runway or taxiway, and where simultaneous 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 4-1.

##### **4.8.2 RECOMMENDATION -**

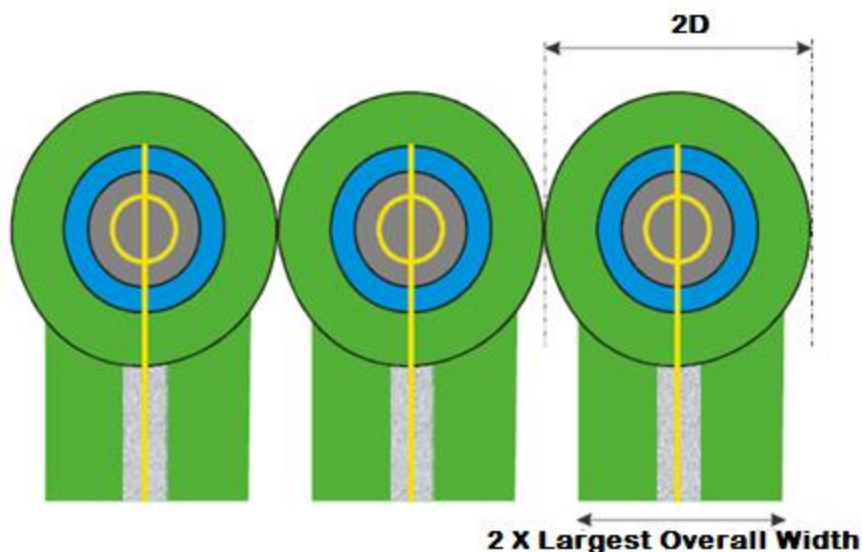
- 4.8.2.1** A FATO should not be located:

- 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.



**FIGURE 4-5: HELICOPTER STANDS DESIGNED FOR HOVER TURNS WITH AIR TAXI-ROUTES / TAXIWAYS SIMULTANEOUS OPERATIONS**





**FIGURE 4-6: HELICOPTER STANDS DESIGNED FOR HOVER TURNS  
WITH AIR TAXI-ROUTES / TAXIWAYS NON-SIMULTANEOUS OPERATIONS**

**4.8.2.2** The central zone of a helicopter stand shall be capable of withstanding the traffic of helicopters 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 taxi-through, and where the helicopter using the stand is not required to turn, the same width as the helicopter ground taxiway.

**Note:** For a helicopter stand intended to be used for turning on the ground by wheeled helicopters, the dimension of the helicopter stand, including the dimension of the central zone, would need to be significantly increased.

#### **4.9 LOCATION OF A FINAL APPROACH AND TAKE-OFF AREA IN RELATION TO A RUNWAY OR TAXIWAY**

**4.9.1** Where a FATO is located near a runway or taxiway, and where simultaneous 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 4-1.

**4.9.2** 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.



#### 4.10 ELEVATED HELIPORTS

**Note 1:** The dimensions of the taxi-routes and helicopter stands include a protection area. 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, refueling, firefighting equipment, etc.

If Aeroplane Mass and/or Helicopter Mass are	Distance between FATO Edge and Runway Edge or Taxiway Edge
Up to but not including 3 175 kg	60 m
3 175 kg up to but not including 5 760 kg	120 m
5 760 kg up to but not including 100 000 kg	180 m
100 000 kg and over	250 m

**TABLE 4.1 – FATO MINIMUM SEPARATION DISTANCE**

**4.10.1** Final approach and take-off areas and touchdown and lift-off areas.

**Note:** On elevated heliports it is presumed that the FATO and one TLOF will be coincidental.

**4.10.2** An elevated heliport shall be provided with one FATO.

**4.10.3** A FATO shall be obstacle free.

**4.10.4** The dimensions of the FATO shall be:

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



**4.10.5 RECOMMENDATION -**

- 4.10.5.1** *Where intended to be used by helicopters operated in performance Class 2 or 3 with MTOM of 3 175 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.

- a) *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% in any direction.*
- b) *The FATO shall be dynamic load-bearing.*
- c) *The surface of the FATO shall be:*
  - i. *resistant to the effects of rotor downwash; and*
  - ii. *free of irregularities that would adversely affect the take-off or landing of helicopters.*

**4.10.6 RECOMMENDATION -**

- 4.10.6.1** *The FATO should provide ground effect.*

**4.11 HELICOPTER CLEARWAYS**

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

**4.11.2 RECOMMENDATION -**

- 4.11.2.1** *The width of a helicopter clearway should not be less than that of the associated safety area.*

**4.11.3 RECOMMENDATION -**

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

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

**4.12 TOUCHDOWN AND LIFT-OFF AREAS**

- 4.12.1** One TLOF shall be coincidental with the FATO.

**Note:** Additional TLOFs may be collocated with helicopter stands.

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

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



- 4.12.4** Slopes on a TLOF collocated with a helicopter stand shall be sufficient to prevent accumulation of water on the surface of the area but shall not exceed 2% in any direction.
- 4.12.5** 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 the helicopters the area is intended to serve.
- 4.12.6** 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.

#### **4.13 SAFETY AREAS**

- 4.13.1** The FATO shall be surrounded by a safety area which need not be solid.
- 4.13.2** 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.
- 4.13.3** 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.
- 4.13.4** There shall be a protected side slope rising at 45 degrees from the edge of the safety area to a distance of 10 m, 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.
- 4.13.5** 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.
- 4.13.6** 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%.



**4.13.7 RECOMMENDATION -**

- 4.13.7.1** *In the case of a FATO of diameter less than 1 D, 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.*
- 4.13.7.2** *The surface of the safety area, when solid, shall not exceed an upward slope of 4% outwards from the edge of the FATO.*
- 4.13.7.3** *Where applicable, the surface of the safety area shall be prepared in a manner to prevent flying debris caused by rotor downwash. The surface of the safety area abutting the FATO shall be continuous with the FATO.*

**4.14 HELICOPTER GROUND TAXIWAYS AND GROUND TAXI-ROUTES**

**Note:** *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.*

- 4.14.1** The width of a helicopter ground taxiway shall not be less than 2 times the largest width of the undercarriage (UCW) of the helicopters the ground taxiway is intended to serve.
- 4.14.2** The longitudinal slope of a helicopter ground taxiway shall not exceed 3%.
- 4.14.3** A helicopter ground taxiway shall be static load-bearing and be capable of withstanding the traffic of the helicopters the helicopter ground taxiway is intended to serve.
- 4.14.4** A helicopter ground taxiway shall be centred on a ground taxi-route.
- 4.14.5** A helicopter ground taxi-route shall extend symmetrically on each side of the centre line to a distance not less than the largest overall width of the helicopters it is intended to serve.
- 4.14.6** No objects shall be permitted on a helicopter ground taxi-route, except for frangible objects, which, because of their function, must be located there.
- 4.14.7** The helicopter ground taxiway and the ground taxi-route shall provide rapid drainage but the helicopter ground taxiway transverse slope shall not exceed 2%.
- 4.14.8** The surface of a helicopter ground taxi-route shall be resistant to the effect of rotor downwash.

**4.15 HELICOPTER AIR TAXIWAYS AND AIR TAXI-ROUTES**

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

- 4.15.1** The width of a helicopter air taxiway shall be at least three times the largest width of the undercarriage (UCW) of the helicopters the air taxiway is intended to serve.
- 4.15.2** The surface of a helicopter air taxiway shall be dynamic load-bearing.





- 4.15.3 The transverse slope of the surface of a helicopter air taxiway shall not exceed 2% and the longitudinal slope shall not exceed 7%. In any event, the slopes shall not exceed the slope landing limitations of the helicopters the air taxiway is intended to serve.
- 4.15.4 A helicopter air taxiway shall be centred on an air taxi-route.
- 4.15.5 A helicopter air taxi-route shall extend symmetrically on each side of the centre line to a distance not less than the largest overall width of the helicopters it is intended to serve.
- 4.15.6 No objects shall be permitted on an air taxi-route, except for frangible objects, which, because of their function, must be located thereon.
- 4.15.7 The surface of an air taxi-route shall be resistant to the effect of rotor downwash. The surface of an air taxi-route shall provide ground effect.
- 4.16 APRONS**
- 4.16.1 The slope in any direction on a helicopter stand shall not exceed 2%.
- 4.16.2 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.
- 4.16.3 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.
- 4.16.4 When a helicopter stand is used for turning, the minimum dimension of the stand and protection area shall be not less than 2 D.
- 4.16.5 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.
- 4.16.6 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.*
- 4.16.7 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 the wheeled helicopters the stand is intended to serve.
- 4.16.8 A helicopter stand and associated protection area intended to be used for air taxiing shall provide ground effect.
- 4.16.9 No fixed objects shall be permitted on a helicopter stand and the associated protection area.



- 4.16.10** The central zone of the helicopter stand shall be capable of withstanding the traffic of the helicopters 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 the ground taxiway.
- 4.16.11** The central zone of a helicopter stand intended to be used for ground taxiing only shall be static load-bearing.
- 4.16.12** 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.*

## **4.17 HELIDECKS**

- 4.17.1** Final approach and take-off areas and touchdown and lift-off areas.
- Note:** For helidecks that have a 1 D or larger FATO it is presumed that the FATO and the TLOF will always occupy the same space and have the same load bearing characteristics so as to be coincidental. For helidecks that are less than 1 D, the reduction in size is only applied to the TLOF which is a load bearing area. In this case, the FATO remains at 1 D but the portion extending beyond the TLOF perimeter need not be load bearing for helicopters. The TLOF and the FATO may be assumed to be collocated.*
- 4.17.2** The specifications in ICAO Annex 14, Vol. 2, Paragraphs 3.3.14 and 3.3.15 shall be applicable for helidecks completed on or after 1 January 2012.
- 4.17.3** A helideck shall be provided with one FATO and one coincident or collocated TLOF.
- 4.17.4** A FATO may be any shape but shall be of sufficient size to contain an area within which can be accommodated a circle of diameter of not less than 1 D of the largest helicopter the helideck is intended to serve.
- 4.17.5** A TLOF may be any shape but 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.
- 4.17.6** **RECOMMENDATION -**
- 4.17.6.1** *For helicopters with a MTOM of 3 175 kg or less, 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.*
- 4.17.6.2** *A helideck shall be arranged to ensure that a sufficient and unobstructed air-gap is provided which encompasses the full dimensions of the FATO.*
- Note:** As a general rule, except for shallow superstructures of three stories or less, a sufficient air-gap will be at least 3 m.*



**4.17.7 RECOMMENDATION -**

**4.17.7.1** *The FATO should be located so as to avoid, as far as is practicable, the influence of environmental effects, including turbulence, over the FATO, which could have an adverse impact on helicopter operations.*

**4.17.7.2** *The TLOF shall be dynamic load-bearing.*

**4.17.7.3** *The TLOF shall provide ground effect.*

**4.17.7.4** *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.*

**4.17.7.5** *For any TLOF 1 D or greater and any TLOF designed for use by helicopters having a D-value of greater than 16.0 m, objects installed in the obstacle-free sector whose function requires them to be located on the edge of the TLOF shall not exceed a height of 25 cm.*

**4.17.8 RECOMMENDATION -**

**4.17.8.1** *For any TLOF 1 D or greater and any TLOF designed for use by helicopters having a D-value of greater than 16.0 m, objects installed in the obstacle-free sector whose function requires them to be located on the edge of the TLOF should be as low as possible and in any case not exceed a height of 15 cm.*

**4.17.8.2** *For any TLOF designed for use by helicopters having a D-value of 16.0 m or less, and any TLOF having dimensions of less than 1 D, objects installed in the obstacle-free sector whose function requires them to be located on the edge of the TLOF, shall not exceed a height of 5 cm.*

**Note:** *Lighting that is mounted at a height of less than 25 cm is typically assessed for adequacy of visual cues before and after installation.*

**4.17.8.3** *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.*

**4.17.8.4** *Safety devices such as safety nets or safety shelves shall be located around the edge of a helideck but shall not exceed the height of the TLOF.*

**4.17.8.5** *The surface of the TLOF shall be skid-resistant to both helicopters and persons and be sloped to prevent pooling of water.*

**4.18 SHIPBOARD HELIPORTS**

**4.18.1** *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 purpose-built shipboard heliports.*



**4.18.2** Final approach and take-off areas and touchdown and lift-off areas:

**Note:** For shipboard heliports it is presumed that the FATO and the TLOF will be coincidental.

- a) A shipboard heliport shall be provided with one FATO and one coincidental or collocated TLOF.
- b) FATO may be any shape but shall be of sufficient size to contain an area within which can be accommodated a circle of diameter of not less than 1 D of the largest helicopter the heliport is intended to serve.
- c) The TLOF of a shipboard heliport shall be dynamic load-bearing.
- d) The TLOF of a shipboard heliport shall provide ground effect.
- e) For purpose-built shipboard heliports provided in a location other than the bow or stern, the TLOF shall be of sufficient size to contain a circle with a diameter not less than 1 D of the largest helicopter the heliport is intended to serve.
- f) For purpose-built shipboard heliports provided in the bow or stern of a ship, the TLOF shall be of sufficient size to:
  - i. contain a circle with a diameter not less than 1 D of the largest helicopter the heliport is intended to serve; or
  - ii. 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 helicopter's longitudinal 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 arc headings, minus the angular distance which corresponds to 15 degrees at each end of the arc.

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

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

**Note:** As a general rule, except for shallow superstructures of three stories or less, a sufficient air-gap will be at least 3 m.



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**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
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**4.18.5      *RECOMMENDATION -***

**4.18.5.1**      *The FATO should be located so as to avoid, as far as is practicable, the influence of environmental effects, including turbulence, over the FATO, which could have an adverse impact on helicopter operations.*

**4.18.5.2**      *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.*

**4.18.5.3**      *For any TLOF 1D or greater and any TLOF designed for use by helicopters having a D-value of greater than 16.0 m, objects installed in the obstacle-free sector whose function requires them to be located on the edge of the TLOF shall not exceed a height of 25 cm.*

**4.18.6      *RECOMMENDATION -***

**4.18.6.1**      *For any TLOF 1 D or greater and any TLOF designed for use by helicopters having a D-value of greater than 16.0 m, objects installed in the obstacle-free sector whose function requires them to be located on the edge of the TLOF should be as low as possible and in any case not exceed a height of 15 cm.*

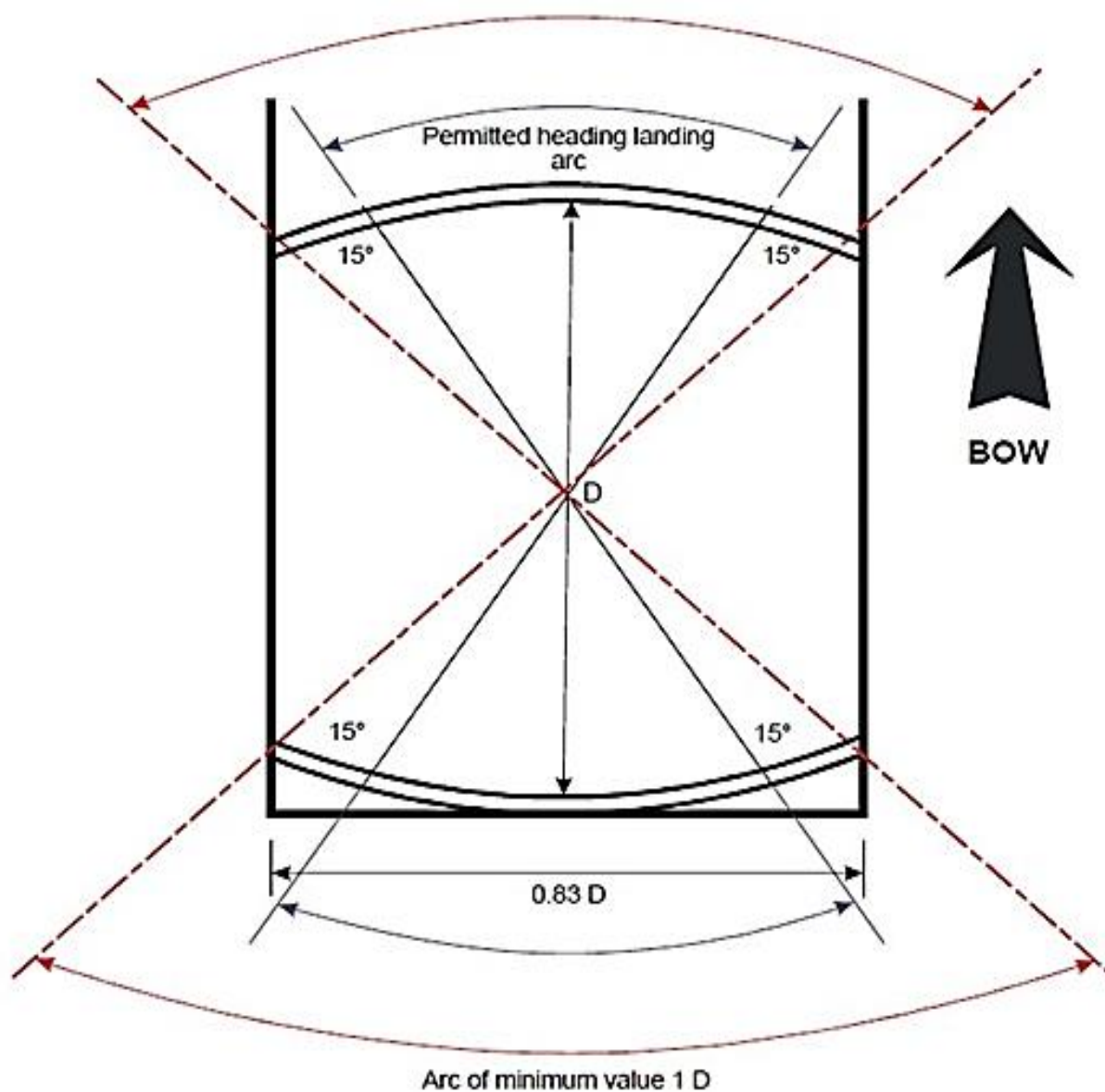
**4.18.6.2**      *For any TLOF designed for use by helicopters having a D-value of 16.0 m or less, and any TLOF having dimensions of less than 1 D, objects in the obstacle-free sector, whose function requires them to be located on the edge of the TLOF, shall not exceed a height of 5 cm.*

**Note:** *Lighting that is mounted at a height of less than 25 cm is typically assessed for adequacy of visual cues before and after installation.*

**4.18.6.3**      *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.*

**4.18.6.4**      *Safety devices such as safety nets or safety shelves shall be located around the edge of a shipboard heliport, except where structural protection exists, but shall not exceed the height of the TLOF.*

**4.18.6.5**      *The surface of the TLOF shall be skid-resistant to both helicopters and persons.*



**FIGURE 4-7: SHIPBOARD PERMITTED LANDING HEADINGS FOR LIMITED HEADING OPERATIONS**





## CHAPTER: 5 OBSTACLE ENVIRONMENT

### 5.1 OBSTACLE LIMITATION SURFACES AND SECTORS

#### 5.1.1 APPROACH SURFACE

**5.1.1.1 Description** - An inclined plane or a combination of planes or, when a turn is involved, a complex surface sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO.

**5.1.1.2 Characteristics** - The limits of an approach surface shall comprise:

- a) an inner edge horizontal and equal in length to the minimum specified width/diameter of the FATO plus the safety area, perpendicular to the centre line of the approach surface and located at the outer edge of the safety area;
- 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 a specified height of 152 m (500 ft) above the elevation of the FATO.

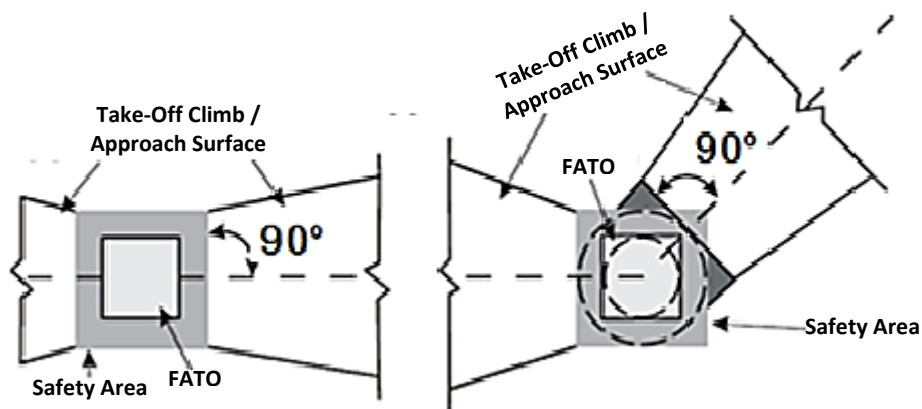
**5.1.1.3** The elevation of the inner edge shall be the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the approach surface. For heliports intended to be used by helicopters operated in performance Class 1 and when approved by an appropriate authority,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

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

**5.1.1.5** In the case of an approach surface involving a turn, 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.

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

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

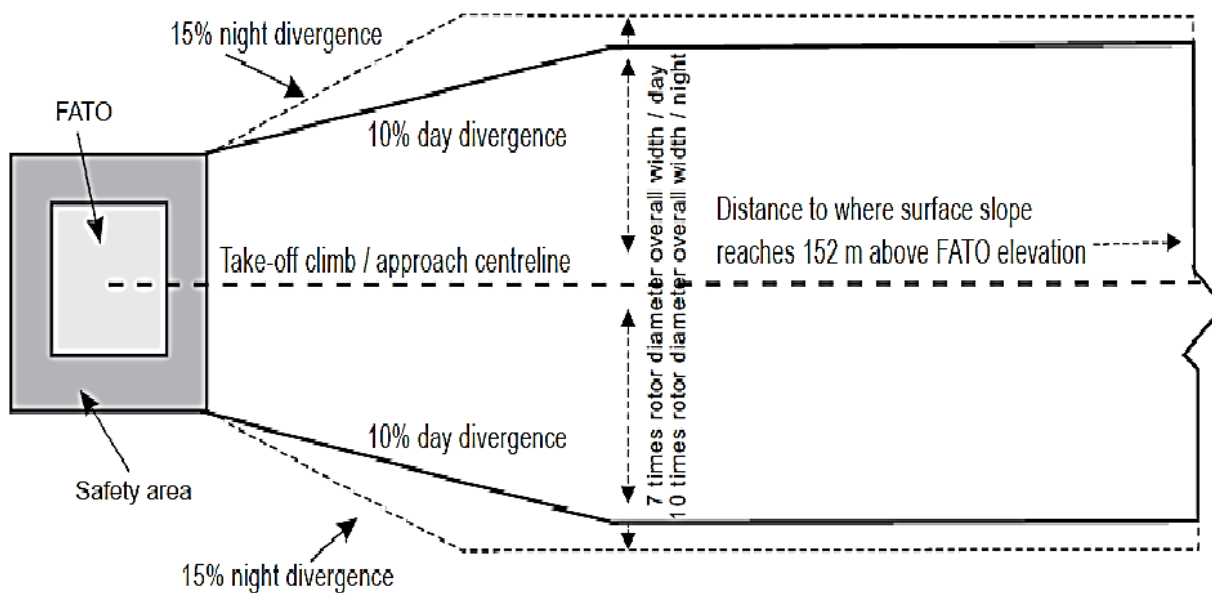


**NOTE 1:** Dark grey shaded area requires the same characteristics as the safety area.

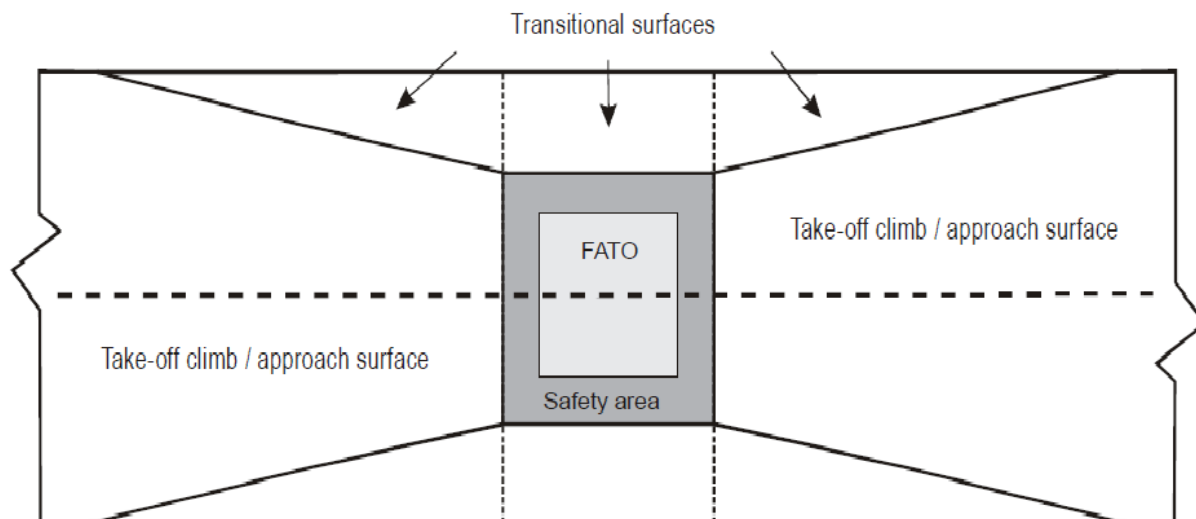
**NOTE 2:** Angle between take-off climb / approach surfaces from centreline to centreline depicted for illustration purposes only.

**NOTE 3:** Offset take-off climb / approach surface rotated around centre point of FATO.

**FIGURE 5-1: OBSTACLE LIMITATION SURFACES**  
**TAKEOFF CLIMB AND APPROACH SURFACE**

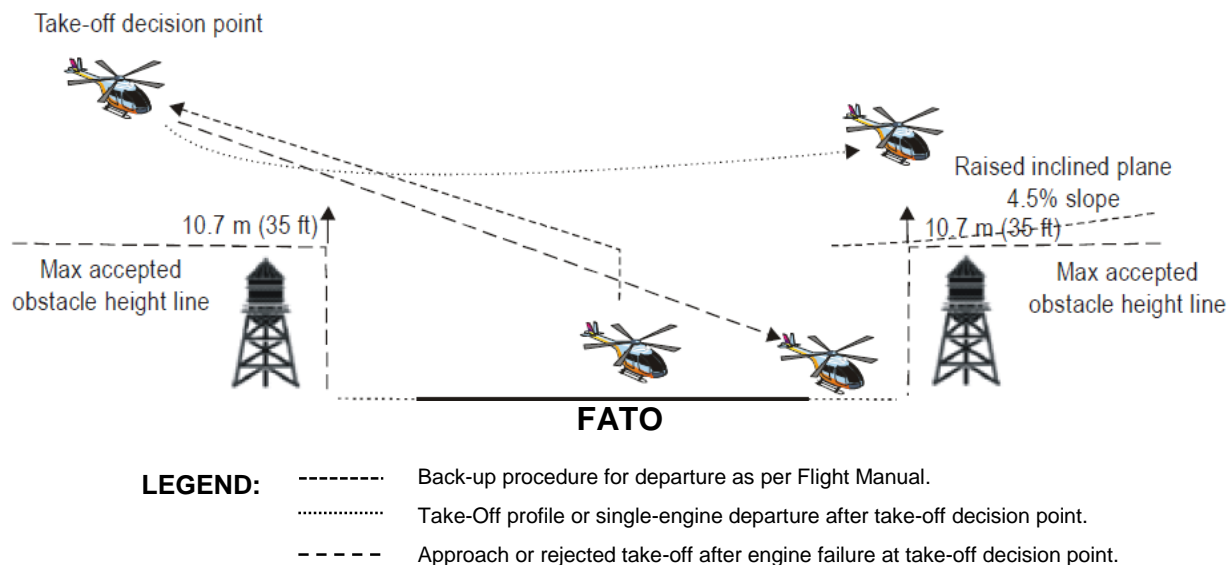


**FIGURE 5-2: TAKEOFF CLIMB AND APPROACH SURFACE WIDTH**



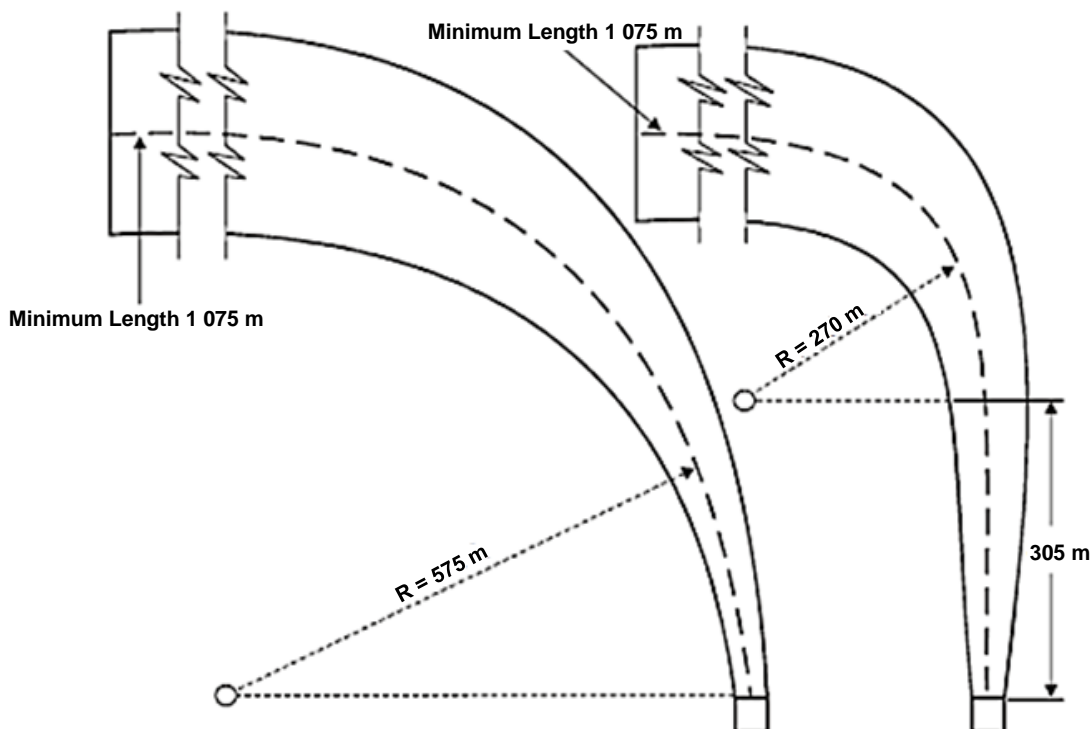
*Note 1.— For single take-off climb / approach surface. Transition surface extends perpendicular to far side of Safety Area.*  
*Note 2.— PANS-OPS, Doc 8168, Volume II, Part IV Helicopters, details procedure design criteria.*  
*Note 3.— This figure shows a square FATO for illustration purposes only. For a circular FATO the transitional surface lower and upper edges would also be circular.*

**FIGURE 5-3: TRANSITIONAL SURFACE FOR A FATO  
WITH PinS APPROACH PROCEDURE WITH VSS**



**NOTE:** 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 manufacturer's operations in Performance Class 1 may be represented differently in the specific Helicopter Flight Manual. ICAO Annex 6, Part 3, Attachment A provides back-up procedures that may be useful in operations in Performance Class 1.

**FIGURE 5-4: EXAMPLE OF RAISED INCLINE PLANE  
DURING OPERATIONS IN PERFORMANCE CLASS 1**



- NOTE 1:** Any combination of a curve and straight portion may be established using the following formula:  $S+R \geq 575 \text{ m}$  and  $R \geq 270 \text{ m}$  where  $S=305 \text{ m}$ , where  $S$  is the length of the straight portion and  $R$  is the radius of turn. Note any combination  $\geq 575 \text{ m}$  will work.
- NOTE 2:** The minimum length of the centreline of the curve and straight portion is 1 075 m but may be longer depending upon the slope used. See Table 5-1 for longer lengths.
- NOTE 3:** 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 should be considered to allow for acceleration.

**FIGURE 5-5: CURVED APPROACH AND TAKE-OFF CLIMB SURFACE FOR ALL FATOs**



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SURFACE AND DIMENSIONS	SLOPE DESIGN CATEGORIES		
	A	B	C
<b>APPROACH AND TAKE-OFF CLIMB SURFACE</b>			
LENGTH OF INNER EDGE	WIDTH OF SAFETY AREA	WIDTH OF SAFETY AREA	WIDTH OF SAFETY AREA
LOCATION OF INNER EDGE	SAFETY AREA BOUNDARY	SAFETY AREA BOUNDARY	SAFETY AREA BOUNDARY
	(CLEARWAY BOUNDARY, IF PROVIDED)		
<b>Divergence: (1<sup>st</sup> and 2<sup>nd</sup> Section)</b>			
Day Use Only	10%	10%	10%
Night Use	15%	15%	15%
<b>First Section:</b>			
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)
<b>Second Section:</b>			
Length	N/A	830 m	N/A
Slope	N/A	16% (1:6:25)	N/A
Outer Width	N/A	(b)	N/A
Total Length from Inner Edge (a)	3 386 m	1 075 m	1 220 m
Transitional Surface: (FATOs with a PinS Approach Procedure with a VSS)			
Slope	50% (1:2)	50% (1:2)	50% (1:2)
Height	45 M	45 M	45 M

**TABLE 5-1: DIMENSIONS AND SLOPES OF OBSTACLE LIMITATION SURFACES FOR ALL VISUAL FATOs**

- 5.1.1.8** 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.
- 5.1.1.9** Seven rotor diameters overall width for day operations or 10 rotor diameters overall width for night operations.



**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 5-1 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.

- 5.1.1.10 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.

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

## 5.2 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.

- 5.2.1 **Description** - A complex surface along the side of the safety area and part of the side of the approach/take-off climb surface, that slopes upwards and outwards to a predetermined height of 45 m (150 ft).

- 5.2.2 **Characteristics** - The limits of a transitional surface shall comprise:

- a) a lower edge beginning at a point on the side of the approach/take-off climb surface at a specified height above the lower edge extending down the side of the approach/take-off climb surface to the inner edge of the approach/takeoff climb surface and from there along the length of the side of the safety area parallel to the centre line of the FATO; and
- b) an upper edge located at a specified height above the lower edge as set out in Table 5-1.

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

- a) along the side of the approach/take-off climb surface — equal to the elevation of the approach/take-off climb surface at that point; and
- b) along the safety area — equal to the elevation of the inner edge of the approach/take-off climb surface.

**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.

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





## 5.3 TAKE-OFF CLIMB SURFACE

**5.3.1 Description** - An inclined plane, a combination of planes or, when a turn is involved, a complex surface sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO.

**5.3.2 Characteristics** - The limits of a take-off climb surface shall comprise:

- a) an inner edge horizontal and equal in length to the minimum specified width/diameter of the FATO plus the safety area, perpendicular to the centre line of the take-off climb surface and located at the outer edge of the safety area;
- b) two side edges originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO; and
- c) an outer edge horizontal and perpendicular to the centre line of the take-off climb surface and at a specified height of 152 m (500 ft) above the elevation of the FATO.

**5.3.3** The elevation of the inner edge shall be the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the take-off climb surface. For heliports intended to be used by helicopters operated in Performance Class 1 and when approved by an appropriate authority, the origin of the inclined plane may be raised directly above the FATO.

**5.3.4** 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.

**5.3.5** 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.

**5.3.6** In the case of a take-off climb surface involving a turn, 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.

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

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

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

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

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



## 5.4 OBSTACLE-FREE SECTOR/SURFACE - HELIDECKS

5.4.1 **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.

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

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

- 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 degrees with the apex located on the periphery of the D 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-degree 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 degrees 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.

## 5.5 LIMITED OBSTACLE SECTOR/SURFACE - HELIDECKS

**Note:** Where obstacles are necessarily located on the structure, a helideck may have a limited obstacle sector (LOS).

5.5.1 **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.

5.5.2 **Characteristics** - A limited obstacle sector shall not subtend an arc greater than 150 degrees. Its dimensions and location shall be as indicated in Figure 5-8 for a 1 D FATO with coincidental TLOF and Figure 5-9 for a 0.83 D TLOF.

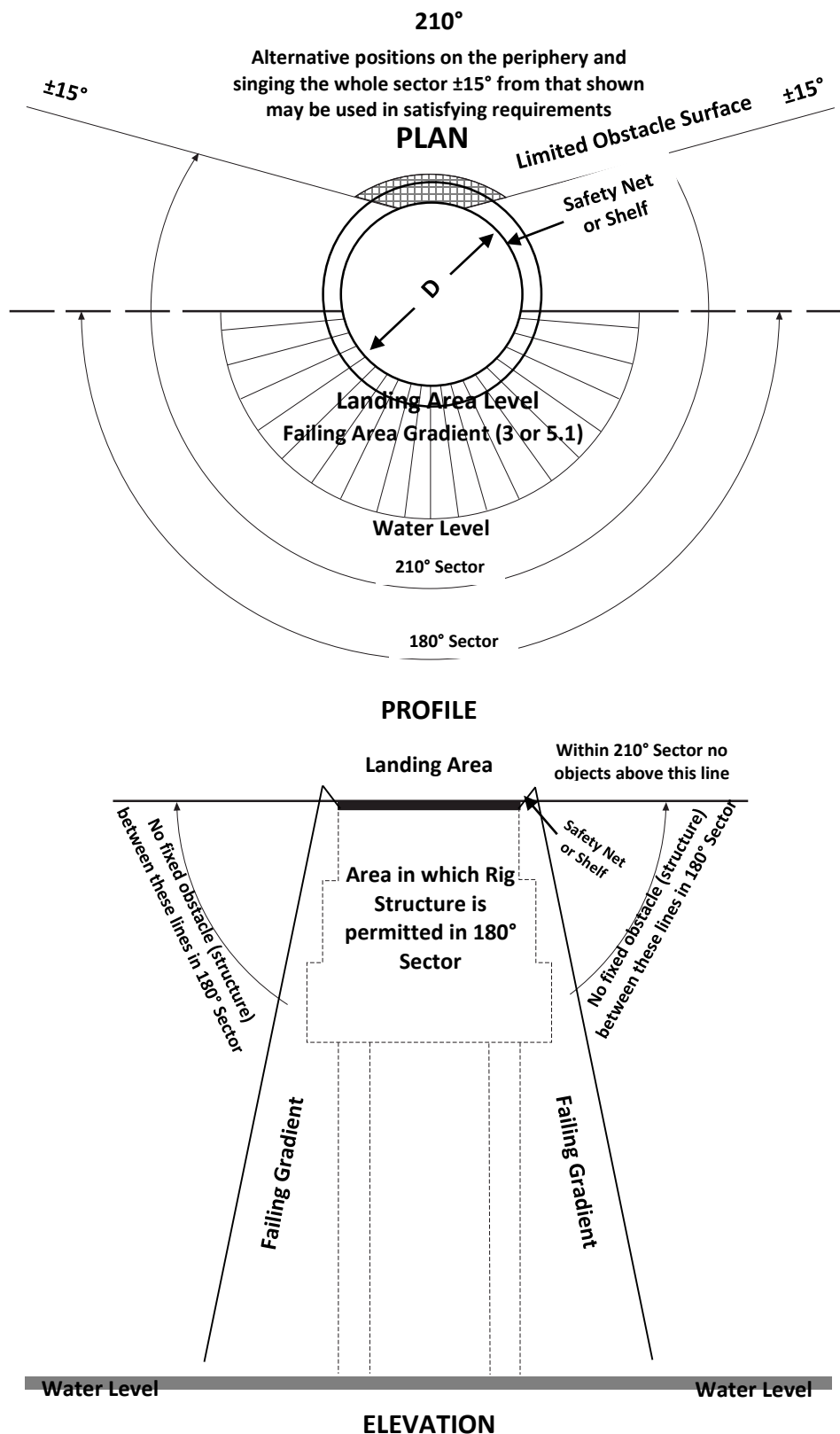
### 5.5.3 OBSTACLE LIMITATION REQUIREMENTS

**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:** If a visual approach slope indicator (VASI) is installed, there are additional obstacle protection surfaces, detailed in Chapter 5, that need to be considered and may be more demanding than the obstacle limitation surfaces prescribed in Table 5-1.



- 5.5.3.1 Surface-Level Heliports** - The following obstacle limitation surfaces shall be established for a FATO at heliports with a PinS approach procedure utilizing a visual segment surface:
- a) take-off climb surface;
  - b) approach surface; and
  - c) transitional surfaces.
- 5.5.3.2** The following obstacle limitation surfaces shall be established for a FATO at heliports, other than specified in ICAO Annex 14, Vol. 2, Paragraph 4.2.1, including heliports with a PinS approach procedure where a visual segment surface is not provided:
- a) take-off climb surface; and
  - b) approach surface.
- 5.5.3.3** The slopes of the obstacle limitation surfaces shall not be greater than, and their other dimensions not less than, those specified in Table 5-1 and shall be located as shown in Figures 5-1, 5-2 and 5-6.
- 5.5.3.4** For heliports that have an approach/take-off climb surface with a 4.5 %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.*
- 5.5.3.5** New objects or extensions of existing objects shall not be permitted above any of the surfaces in ICAO Annex 14, Vol. 2, Paragraphs 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.
- 5.5.3.6** **Recommendation** - *Existing objects above any of the surfaces in ICAO Annex 14, Vol. 2, Paragraphs 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.*
- 5.5.3.7** A surface-level 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;
  - c) the performance and operating limitations of helicopters intending to use the heliport; and
  - d) the local meteorological conditions including the prevailing winds.

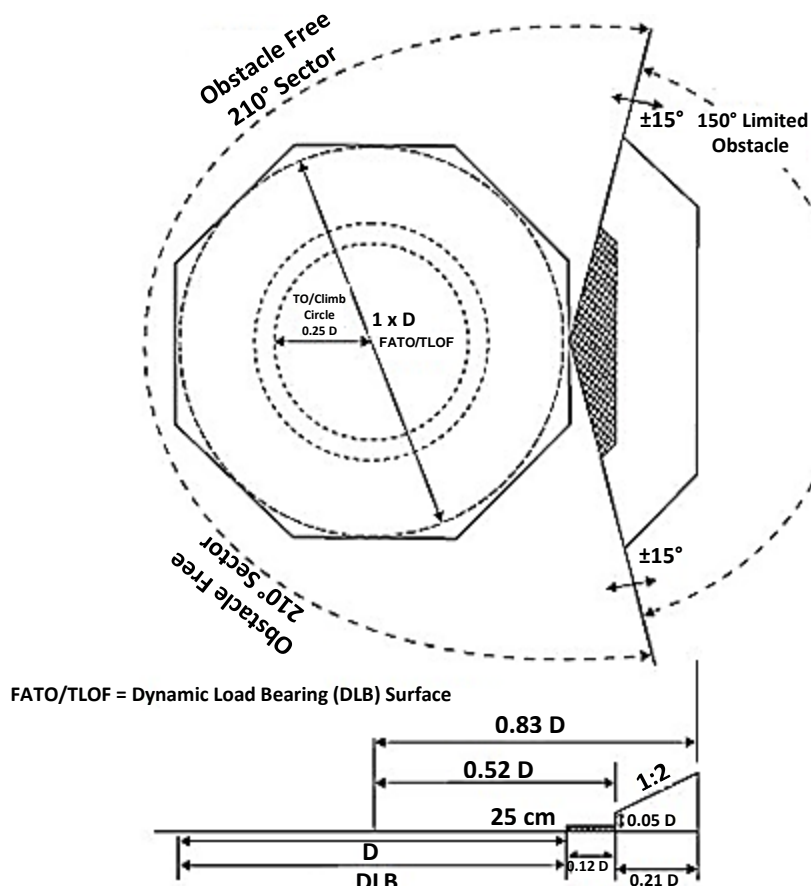


**FIGURE 5-6: HELIDECK OBSTACLE-FREE SECTOR**

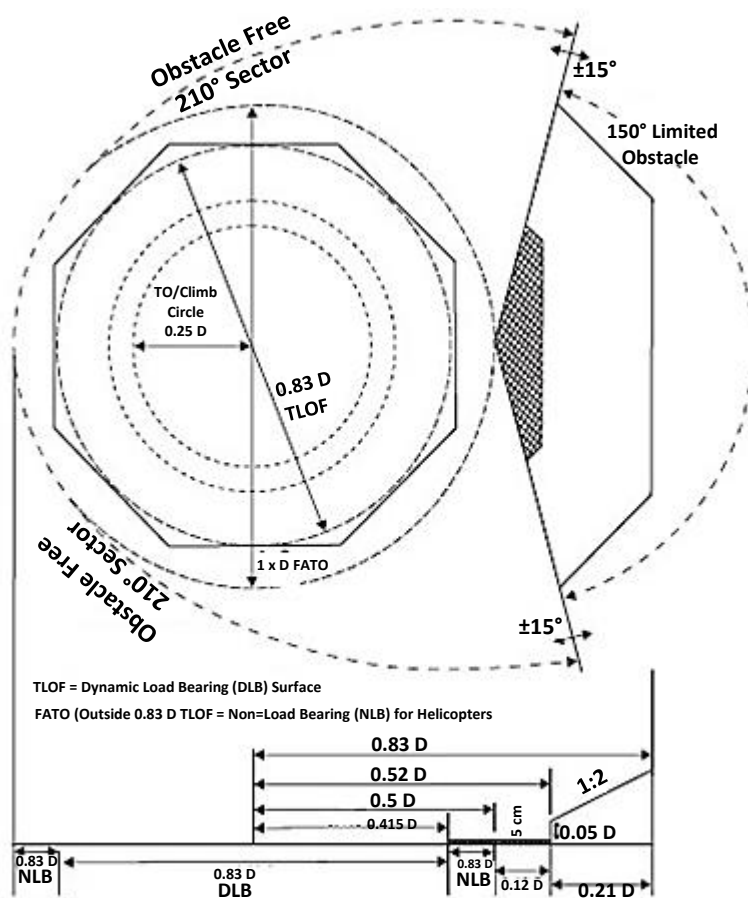


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**FIGURE 5-7: HELIDECK OBSTACLE LIMITATION SECTORS AND SURFACES FOR A FATO AND COINCIDENTAL TLOF OF 1 D AND LARGER**



**NOTE:** Height of 5 cm high shaded area is not to scale.

**FIGURE 5-8: HELIDECK OBSTACLE LIMITATION SECTORS AND SURFACES FOR A FATO AND COINCIDENTAL TLOF OF 0.83 AND LARGER**

**5.5.3.8 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.

#### **5.5.4 ELEVATED HELIPORTS**

**5.5.4.1** The obstacle limitation surfaces for elevated heliports shall conform to the requirements for surface-level heliports specified in ICAO Annex 14, Vol. 2, Paragraphs 4.2.1 to 4.2.6.





- 5.5.4.2 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;
  - c) the performance and operating limitations of helicopters intending to use the heliport; and
  - d) the local meteorological conditions including the prevailing winds.

- 5.5.4.3 **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.

## 5.6 HELIDECKS

- 5.6.1 A helideck shall have an obstacle-free sector.

**Note:** A helideck may have a LOS.

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

- 5.6.3 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.

**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.

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

**Note:** Where the area enclosed by the TLOF perimeter marking is a shape other than circular, the extent of the LOS segments is represented as lines parallel to the perimeter of the TLOF rather than arcs. Figure 5-8 has been constructed on the assumption that an octagonal helideck arrangement is provided.



- 5.6.5 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.

*Note: Where the area enclosed by the TLOF perimeter marking is a shape other than circular, the extent of the LOS segments is represented as lines parallel to the perimeter of the TLOF rather than arcs. Figure 5-8 has been constructed on the assumption that an octagonal helideck arrangement is provided.*

## 5.7 SHIPBOARD HELIPORTS

### 5.7.1 PURPOSE-BUILT HELIPORTS LOCATED FORWARD OR AFT

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

### 5.7.2 AMIDSHIPS LOCATION - PURPOSE-BUILT AND NON-PURPOSE-BUILT

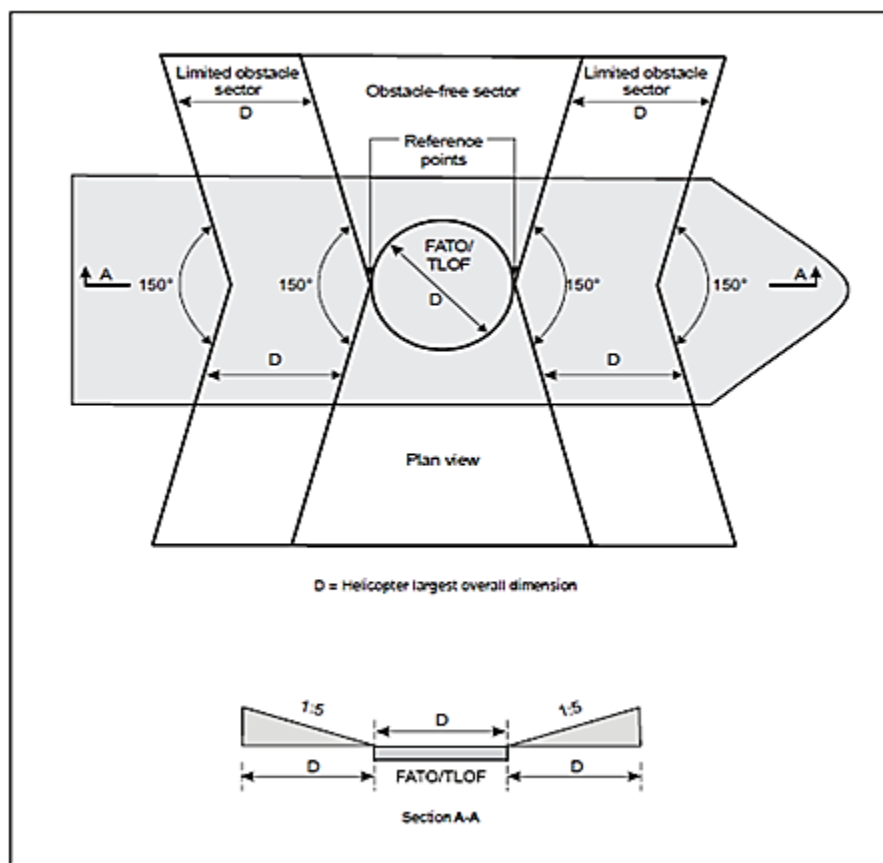
- 5.7.2.1 Forward and aft of a TLOF of 1 D and larger shall be two symmetrically located sectors, each covering an arc of 150 degrees, with their apexes on the periphery of the TLOF. Within the area enclosed by these two sectors, there shall be no objects rising above the level of the TLOF, except those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

- 5.7.2.2 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.

- 5.7.2.3 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.

### 5.7.3 Non-Purpose-Built Heliports:

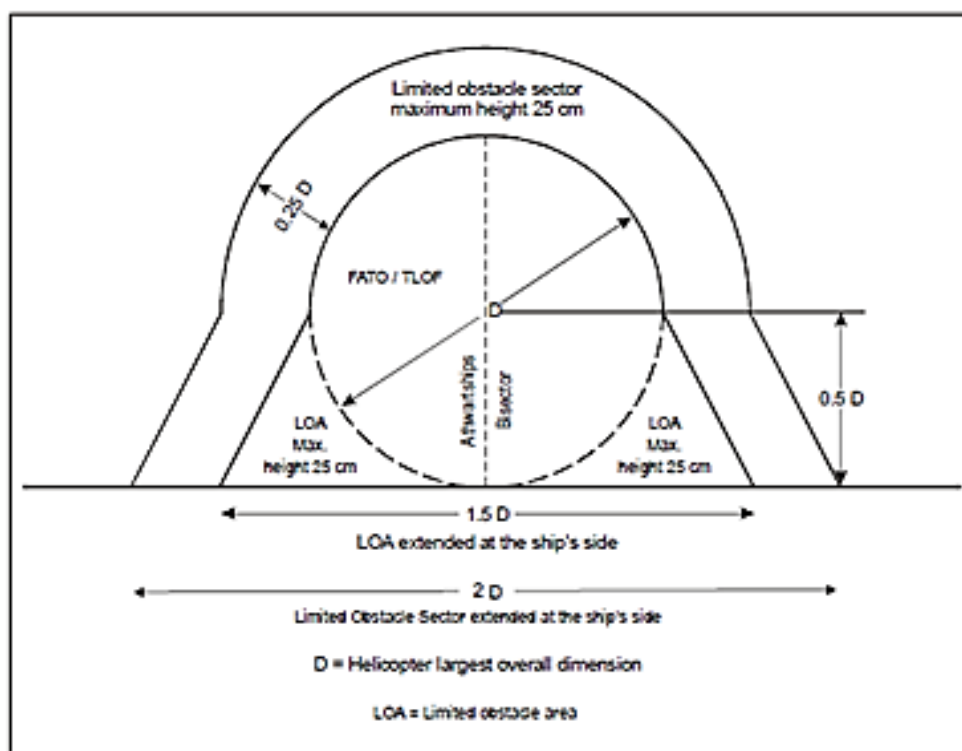
- 5.7.3.1 **Ship's Side Location** - No objects shall be located within the TLOF except those aids essential for the safe operation of a helicopter (such as nets or lighting) and then only up to a maximum height of 2.5 cm. Such objects shall only be present if they do not represent a hazard to helicopters.



**FIGURE 5-9: AMIDSHIP'S LOCATION – SHIPBOARD  
HELIPORT OBSTACLE LIMITATION SURFACES**

- 5.7.3.2** 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 athwart ships 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. Such objects shall only be present if they do not represent a hazard to helicopters.
- 5.7.3.3** A limited obstacle sector 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 limited obstacle sector 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 athwart ships 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.

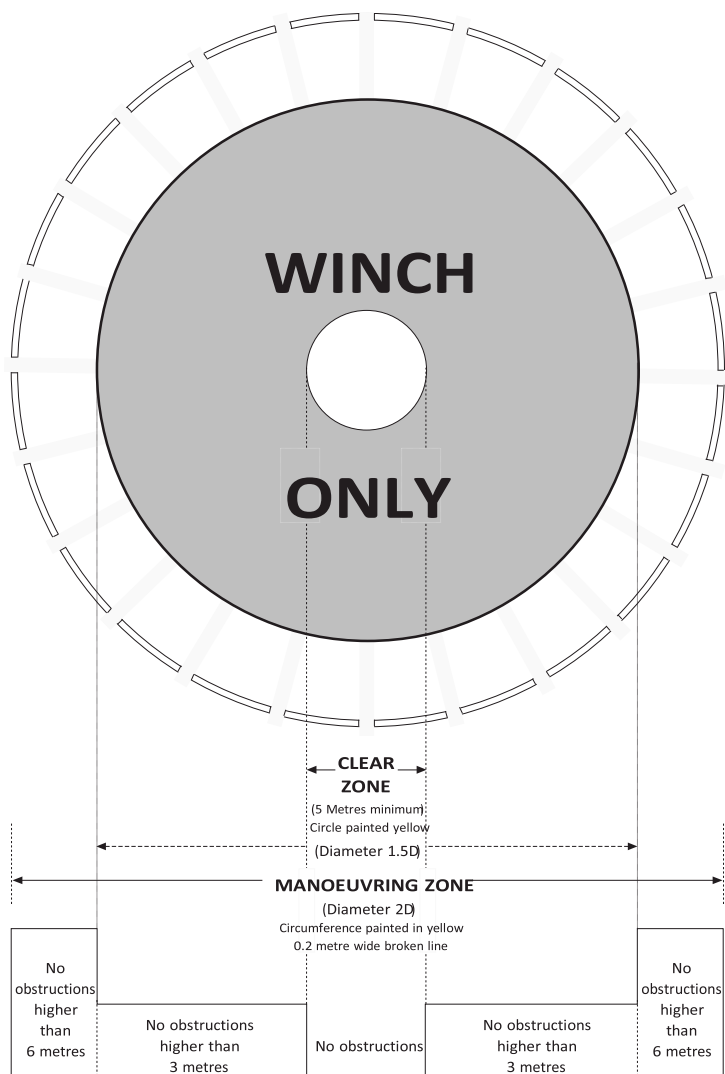
**Note:** Any objects located within the areas described in ICAO Annex 14, Vol. 2, Paragraphs 4.2.23 and 4.2.24 that exceed the height of the TLOF are notified to the helicopter operator using a ship's helicopter landing area plan. For notification purposes it may be necessary to consider immovable objects beyond the limit of the surface prescribed in ICAO Annex 14, Vol. 2, Paragraph 4.2.24 particularly if objects are significantly higher than 25 cm and in close proximity to the boundary of the LOS.



**FIGURE 5-10: SHIP'S-SIDE NON-PURPOSE-BUILT  
HELIPORT OBSTACLE LIMITATION SECTORS AND SURFACES**

## 5.8 WINCHING AREAS

- 5.8.1** 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.
- 5.8.2** 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.
- 5.8.3** Within the clear zone of a designated winching area, no objects shall be located above the level of its surface.
- 5.8.4** Objects located within the inner manoeuvring zone of a designated winching area shall not exceed a height of 3 m.
- 5.8.5** Objects located within the outer manoeuvring zone of a designated winching area shall not exceed a height of 6 m.



**WINCH ONLY** to be marked in white so as to be easily visible to the helicopter pilot.

**FIGURE 5-11: WINCHING AREA OF A SHIP**



## CHAPTER: 6 VISUAL AIDS

### 6.1 INDICATORS

#### 6.1.1 WIND DIRECTION INDICATORS

6.1.1.1 **Application** - A heliport shall be equipped with at least one wind direction indicator.

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

6.1.1.3 **Recommendation** - Where a TLOF and/or FATO may be subject to a disturbed airflow, then additional wind direction indicators located close to the area should be provided to indicate the surface wind on the area.

6.1.1.4 **Characteristics** - A wind direction indicator shall be constructed so that it gives a clear indication of the direction of the wind and a general indication of the wind speed.

6.1.1.5 **Recommendation** - An indicator should be a truncated cone made of lightweight fabric and should have the following minimum dimensions:

	SURFACE-LEVEL HELIPORTS	ELEVATED HELIPORTS AND HELIDECKS
Length	2.4 m	1.2 m
Diameter (larger end)	0.6 m	0.3 m
Diameter (smaller end)	0.3 m	0.15 m

6.1.1.6 The colour of the wind direction indicator should be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft) above the heliport, having regard to background. Where practicable, a single colour, preferably white or orange, should be used. Where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands the first and last band being the darker colour.

6.1.1.7 A wind direction indicator at a heliport intended for use at night shall be illuminated.

### 6.2 MARKINGS AND MARKERS

#### 6.2.1 WINCHING AREA MARKING

6.2.1.1 **Application** - Winching area markings shall be provided at a designated winching area.

6.2.1.2 **Location** - Winching area markings shall be located so that their centre (s) coincides with the centre of the clear zone of the winching area.

6.2.1.3 **Characteristics** -





- a) Winching area markings shall comprise a winching area clear zone marking and a winching area manoeuvring zone marking.
- b) A winching area clear zone marking shall consist of a solid circle of diameter not less than 5 m and of conspicuous colour.
- c) A winching area manoeuvring zone marking shall consist of a broken circle line of 30 cm 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.

## 6.2.2 HELIPORT IDENTIFICATION MARKING

- 6.2.2.1 Location** - All FATOs except runway-type FATOs - A heliport identification marking shall be located at or near the centre of the FATO.

***Note 1:** If the touchdown/positioning marking is offset on a helideck, the heliport identification marking is established in the centre of the touchdown/positioning marking.*

***Note 2:** On a FATO, which does not contain a TLOF and which is marked with an aiming point marking, except for a heliport at a hospital, the heliport identification marking is established in the centre of the aiming point marking.*

- 6.2.2.2 Runway-Type FATOs** - Heliport identification marking shall be located in the FATO and when used in conjunction with FATO designation markings, shall be displayed at each end of the FATO.

- 6.2.2.3 Characteristics** - 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. For a non-purpose-built shipboard heliport located on a ship's side, the cross arm shall be parallel with the side of the ship.

- 6.2.2.4 Recommendation** - On a helideck or a shipboard heliport where the D-value is 16.0 m or larger, 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. Where the D-value is less than 16.0 m, the size of the heliport identification H marking should have a height of 3 m with an overall width not exceeding 2.25 m and a stroke width not exceeding 0.5 m.

## 6.2.3 MAXIMUM ALLOWABLE MASS MARKING

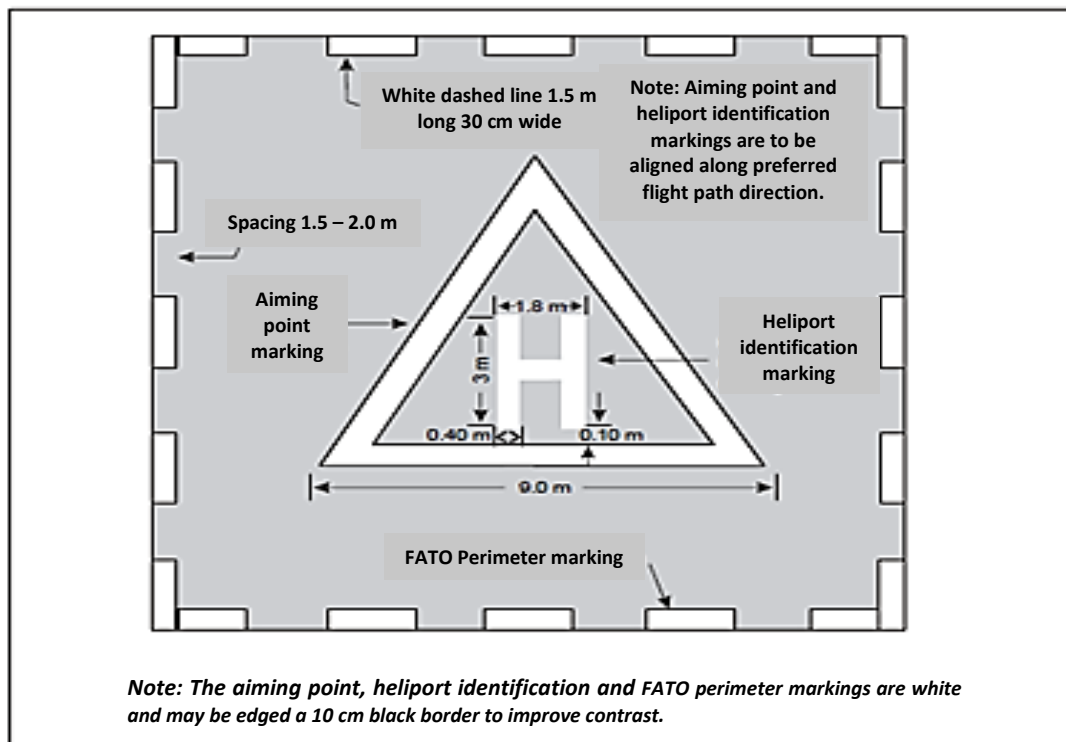
- 6.2.3.1 Application (Recommendation)** - A maximum allowable mass marking shall be displayed at an elevated heliport, a helideck and a shipboard heliport.

- 6.2.3.2 Location (Recommendation)** - A maximum allowable mass marking should be located within the TLOF or FATO and so arranged as to be readable from the preferred final approach direction.

- 6.2.3.3 Characteristics** - A maximum allowable mass marking shall consist of a one-, two- or three-digit number. The maximum allowable mass shall be expressed in tonnes (1 000 kg) rounded down 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 down 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.*

- 6.2.3.4** ***Recommendation** - The maximum allowable mass 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 lb.*
- 6.2.3.5** ***Recommendation** - When the maximum allowable mass is expressed to 100 kg, the decimal place should be preceded with a decimal point marked with a 30 cm square.*
- 6.2.4** **ALL FATOS EXCEPT RUNWAY-TYPE FATOS**
- 6.2.4.1** ***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 6-4 for a FATO with a dimension of more than 30 m. For a FATO with a dimension of between 15 m to 30 m the height of the numbers and the letter of the marking should be a minimum of 90 cm, and for a FATO with a dimension of less than 15 m the height of the numbers and the letter of the marking should be a minimum of 60 cm, each with a proportional reduction in width and thickness.*
- 6.2.5** **RUNWAY-TYPE FATOS**
- 6.2.5.1** ***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 6-4.*



**FIGURE 6-1: COMBINED HELIPOT IDENTIFICATION, AIMING POINT AND FATO PERIMETER MARKING**



## 6.2.6 D-VALUE MARKING

**6.2.6.1 Application (All FATOs Except Runway-Type FATOs)** - The D-value marking shall be displayed at a helideck and at a shipboard heliport.

### 6.2.6.2 Application (All Runway-Type FATOs)

*Note: The D-value is not required to be marked on a heliport with a runway-type FATO.*

**6.2.6.3 Recommendation:** The D-value marking should be displayed at surface-level and elevated heliports designed for helicopters operated in Performance Class 2 or 3.

**6.2.6.4 Location** - A D-value marking shall be located within the TLOF or FATO and so arranged as to be readable from the preferred final approach direction.

**6.2.6.5 Recommendation** - Where there is more than one approach direction, additional D-value markings should be provided such that at least one D-value marking is readable from the final approach directions. For a non-purpose-built heliport located on a ship's side, D-value markings should be provided on the perimeter of the D circle at the 2 o'clock, 10 o'clock and 12 o'clock positions when viewed from the side of the ship facing towards the centre line.

**6.2.6.6 Characteristics** - The D-value marking shall be white. The D-Value marking shall be rounded to the nearest whole metre or foot with 0.5 rounded down.

**6.2.6.7 Recommendation** - The numbers of the marking should have a colour contrasting with the background and should be in the form and proportion shown in Figure 6-4 for a FATO with a dimension of more than 30 m. For a FATO with a dimension of between 15 m to 30 m the height of the numbers of the marking should be a minimum of 90 cm, and for a FATO with a dimension of less than 15 m the height of the numbers of the marking should be a minimum of 60 cm, each with a proportional reduction in width and thickness.

## 6.2.7 FINAL APPROACH AND TAKE-OFF AREA DIMENSION(S) MARKING

### 6.2.7.1 Application (Recommendation) –

- a) The actual dimension(s) of the FATO intended to be used by helicopters operated in performance Class 1 should be marked on the FATO.
- b) If the actual dimension(s) of the FATO to be used by helicopters operated in performance Class 2 or 3 is less than 1 D, the dimension(s) should be marked on the FATO.

**6.2.7.2 Location** - A FATO dimension marking shall be located within the FATO and so arranged as to be readable from the preferred final approach direction.

**6.2.7.3 Characteristics** - The dimension(s) shall be rounded to the nearest metre or foot.

*Note: If the FATO is rectangular both the length and width of the FATO relative to the preferred final approach direction is indicated.*



**6.2.8 ALL FATOS EXCEPT RUNWAY-TYPE FATOS**

**6.2.8.1 Recommendation** - The numbers of the marking should have a colour contrasting with the background and should be in the form and proportion shown in Figure 5-4 for a FATO with a dimension of more than 30 m. For a FATO with a dimension between 15 m to 30 m the height of the numbers of the marking should be a minimum of 90 cm, and for a FATO with a dimension of less than 15 m the height of the numbers of the marking should be a minimum of 60 cm, each with a proportional reduction in width and thickness.

**6.2.9 RUNWAY-TYPE FATOS**

**6.2.9.1 Recommendation** - The numbers of the marking should have a colour contrasting with the background and should be in the form and proportion.

**6.2.10 FINAL APPROACH AND TAKE-OFF AREA PERIMETER MARKING OR MARKERS FOR SURFACE-LEVEL HELIPORTS**

**6.2.10.1 Application** - FATO perimeter marking or markers shall be provided at a surface-level heliport where the extent of the FATO is not self-evident.

**6.2.10.2 Location** - The FATO perimeter marking or markers shall be located on the edge of the FATO.

**6.2.10.3 Characteristics (Runway-Type FATOs)** - The perimeter of the FATO shall be defined with markings or markers spaced at equal intervals of not more than 50 m with at least three markings or markers on each side including a marking or marker at each corner.

**6.2.10.4** A FATO perimeter marking shall be a rectangular stripe with a length of 9 m or one-fifth of the side of the FATO which it defines and a width of 1 m:

- a) FATO perimeter markings shall be white.
- b) A FATO perimeter marker shall have dimensional characteristics as shown in Figure 6-5.
- c) FATO perimeter markers shall be of colour(s) that contrast effectively against the operating background.

**6.2.10.5 Recommendation** - FATO perimeter markers should be a single colour, orange or red, or two contrasting colours, orange and white or, alternatively, red and white should be used except where such colours would merge with the background.

**6.2.10.6 Characteristics (All FATOs Except Runway-Type FATOs)** - For an unpaved FATO the perimeter shall be defined with flush in-ground markers. The FATO perimeter markers shall be 30 cm in width, 1.5 m in length, and with end-to-end spacing of not less than 1.5 m and not more than 2 m. The corners of a square or rectangular FATO shall be defined. For a paved FATO the perimeter shall be defined with a dashed line. The FATO perimeter marking segments shall be 30 cm in width, 1.5 m in length, and with end-to-end spacing of not less than 1.5 m and not more than 2 m. The corners of the square or rectangular FATO shall be defined. FATO perimeter markings and flush in-ground markers shall be white.

**6.2.11 FINAL APPROACH AND TAKE-OFF AREA DESIGNATION MARKINGS FOR RUNWAY-TYPE FATOS**

**6.2.11.1 Application (Recommendation)** - A FATO designation marking should be provided at a heliport where it is necessary to designate the FATO to the pilot.

**6.2.11.2 Location** - A FATO designation marking shall be located at the beginning of the FATO.

**6.2.11.3 Characteristics** - A FATO designation marking shall consist of a two-digit number. The two-digit number shall be the whole number nearest the one-tenth of the magnetic North when viewed from the direction of approach. When the above rule would give a single digit number, it shall be preceded by a zero. The marking shall be supplemented by the heliport identification marking.

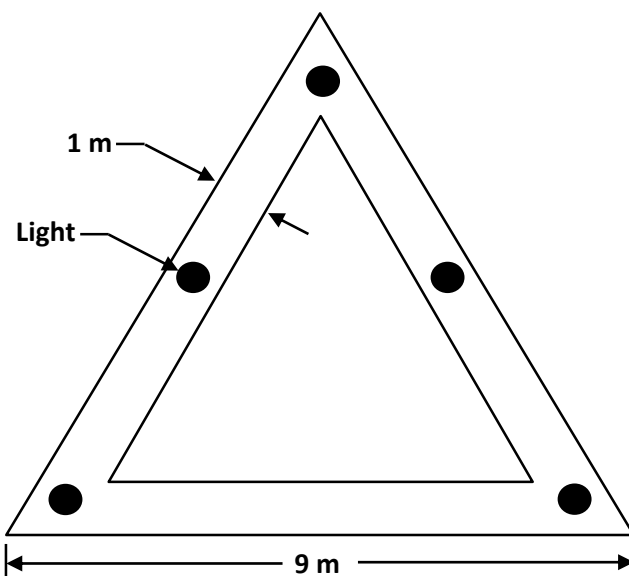
**6.2.12 AIMING POINT MARKING**

**6.2.12.1 Application (Recommendation)** - An aiming point marking should be provided at a heliport where it is necessary for a pilot to make an approach to a particular point above a FATO before proceeding to a TLOF.

**6.2.12.2 Location (Runway-Type FATOs)** - The aiming point marking shall be located within the FATO.

**6.2.12.3 Location (All FATOs Except Runway-Type FATOs)** - The aiming point marking shall be located at the centre of the FATO as shown in Figure 6-1.

**6.2.12.4 Characteristics** - The aiming point marking shall be an equilateral triangle with the bisector of one of the angles aligned with the preferred approach direction. The marking shall consist of continuous white lines, and the dimensions of the marking shall conform to those shown in Figure 6-6.



**FIGURE 6-6: AIMING POINT MARKING**



**6.2.13 TOUCHDOWN AND LIFT-OFF AREA PERIMETER MARKING**

**6.2.13.1 Application -** A TLOF perimeter marking shall be displayed on a TLOF located in a FATO at a surface-level heliport if the perimeter of the TLOF is not self-evident. A TLOF perimeter marking shall be displayed on an elevated heliport, a helideck and a shipboard heliport.

**6.2.13.2 Recommendation -** A TLOF perimeter marking should be provided on each TLOF collocated with a helicopter stand at a surface-level heliport.

**6.2.13.3 Location -** The TLOF perimeter marking shall be located along the edge of the TLOF.

**6.2.13.4 Characteristics.** A TLOF perimeter marking shall consist of a continuous white line with a width of at least 30 cm.

**6.2.14 TOUCHDOWN/POSITIONING MARKING**

**6.2.14.1 Application -**

- a) A touchdown/positioning marking shall be provided where it is necessary for a helicopter to touch down and/or be accurately positioned by the pilot. A touchdown/positioning marking shall be provided on a helicopter stand designed for turning.
- b) A touchdown/positioning marking shall be located so that when the pilot's seat is over the marking, the whole of the undercarriage will be within the TLOF and all parts of the helicopter will be clear of any obstacle by a safe margin.
- c) On a heliport the centre of the touchdown/positioning marking shall be located at the centre of the TLOF, except the centre of the touchdown/positioning marking may be offset away from the centre of the TLOF where an aeronautical study indicates such offsetting to be necessary and providing that a marking so offset would not adversely affect safety. For a helicopter stand designed for hover turning, the touchdown/positioning marking shall be located in the centre of the central zone.
- d) On a helideck the centre of the touchdown marking shall be located at the centre of the 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.

**6.2.14.2 Characteristics -**

- a) A touchdown positioning marking shall be a yellow circle and have a line width of at least 0.5 m. For a helideck or a purpose-built shipboard heliport with a D-value of 16.0 m or larger, the line width shall be at least 1 m.
- b) The inner diameter of the touchdown/positioning marking shall be 0.5 D of the largest helicopter the TLOF and/or the helicopter stand is intended to serve.





## 6.2.15 HELIPORT NAME MARKING

**6.2.15.1 Application (Recommendation)** - A heliport name marking should be provided at a heliport and helideck where there is insufficient alternative means of visual identification.

**6.2.15.2 Location (Recommendation)** - The heliport name marking should be displayed on the heliport so as to be visible, as far as practicable, at all angles above the horizontal. Where an obstacle sector exists on a helideck the marking should be located on the obstacle side of the heliport identification marking. For a non-purpose-built heliport located on a ship's side the marking should be located on the inboard side of the heliport identification marking in the area between the TLOF perimeter marking and the boundary of the LOS.

**6.2.15.3 Characteristics** - A heliport name marking shall consist of the name or the alphanumeric designator of the heliport as used in the radio (R/T) communications.

**6.2.15.4 Recommendation** - A heliport name marking intended for use at night or during conditions of poor visibility should be illuminated, either internally or externally.

## 6.2.16 RUNWAY-TYPE FATOS

**6.2.16.1 Recommendation** - The characters of the marking should be not less than 3 m in height.

## 6.2.17 ALL FATOS EXCEPT RUNWAY-TYPE FATOS

**6.2.17.1 Recommendation** - The characters of the marking should be not less than 1.5 m in height at surface-level heliports and not less than 1.2 m on elevated heliports, helidecks and shipboard heliports. The colour of the marking should contrast with the background and preferably be white.

## 6.2.18 HELIDECK OBSTACLE-FREE SECTOR (CHEVRON) MARKING

**6.2.18.1 Application** - A helideck with adjacent obstacles that penetrate above the level of the helideck shall have an obstacle-free sector marking.

**6.2.18.2 Location** - A helideck obstacle-free sector marking shall be located, where practicable, at a distance from the centre of the TLOF equal to the radius of the largest circle that can be drawn in the TLOF or 0.5 D, whichever is greater.

**Note:** Where the Point of Origin is outside the TLOF, and it is not practicable to physically paint the chevron, the chevron is relocated to the TLOF perimeter on the bisector of the OFS. In this case the distance and direction of displacement, along with the attention getting "WARNING DISPLACED CHEVRON", with the distance and direction of displacement, is marked in a box beneath the chevron in black characters not less than 10 cm high.

## 6.2.18.3 Characteristics -

- The helideck obstacle-free sector marking shall indicate the location of the obstacle-free sector and the directions of the limits of the sector.
- The height of the chevron shall not be less than 30 cm.
- The chevron shall be marked in a conspicuous colour.

**6.2.18.4 Recommendation** - The colour of the chevron should be black.

## 6.2.19 HELIDECK AND SHIPBOARD HELIPORT SURFACE MARKING

**6.2.19.1 Application (Recommendation)** - A surface marking should be provided to assist the pilot to identify the location of the helideck or shipboard heliport during an approach by day.

**6.2.19.2 Location (Recommendation 2).** A surface marking should be applied to the dynamic load bearing area bounded by the TLOF perimeter marking.

**6.2.19.3 Characteristics (Recommendation)** - The helideck or shipboard heliport surface bounded by the TLOF perimeter marking should be of dark green using a high friction coating.

**Note:** Where the application of a surface coating may have a degrading effect on friction qualities the surface might not be painted. In such cases the best operating practice to enhance the conspicuity of markings is to outline deck markings with a contrasting colour.

## 6.2.20 HELIDECK PROHIBITED LANDING SECTOR MARKINGS

**6.2.20.1 Application (Recommendation)** - Helideck prohibited landing sector markings should be provided where it is necessary to prevent the helicopter from landing within specified headings.

**6.2.20.2 Location** - The prohibited landing sector markings shall be located on the touchdown/positioning marking to the edge of the TLOF, within the relevant headings.

**6.2.20.3 Characteristics** - The prohibited landing sector markings shall be indicated by white and red hatched markings as shown.

**Note:** Prohibited landing sector markings, where deemed necessary, are applied to indicate a range of helicopter headings that are not to be used by a helicopter when landing. This is to ensure that the nose of the helicopter is kept clear of the hatched markings during the manoeuvre to land.



**FIGURE 6-7: HELIDECK PROHIBITED LANDING SECTOR MARKING**



## 6.2.21 HELICOPTER GROUND TAXIWAY MARKINGS AND MARKERS

**6.2.21.1 Application (Recommendation)** - *The centre line of a helicopter ground taxiway should be identified with a marking, and the edges of a helicopter ground taxiway, if not self-evident, should be identified with markers or markings.*

### 6.2.21.2 Location -

- a) Helicopter ground taxiway markings shall be along the centre line and, if required, along the edges of a helicopter ground taxiway.
- b) Helicopter ground taxiway edge markers shall be located at a distance of 0.5 m to 3 m beyond the edge of the helicopter ground taxiway.
- c) Helicopter ground taxiway edge markers, where provided, shall be spaced at intervals of not more than 15 m on each side of straight sections and 7.5 m on each side of curved sections with a minimum of four equally spaced markers per section.

### 6.2.21.3 Characteristics -

- a) A helicopter ground taxiway centre line marking shall be a continuous yellow line 15 cm in width.
- b) Helicopter ground taxiway edge markings shall be a continuous double yellow line, each 15 cm in width, and spaced 15 cm apart (nearest edge to nearest edge).

**Note:** *Signage may be required on an aerodrome where it is necessary to indicate that a helicopter ground taxiway is suitable only for the use of helicopters.*

- c) A helicopter ground taxiway edge marker shall be frangible.

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

- e) A helicopter ground taxiway edge marker shall be blue.

**Note:** *If blue markers are used on an aerodrome, signage may be required to indicate that the helicopter ground taxiway is suitable only for helicopters.*

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

## 6.2.22 HELICOPTER AIR TAXIWAY MARKINGS AND MARKERS

**Note:** *Air taxi-routes are not required to be marked.*

**6.2.22.1 Application (Recommendation)** - *The centre line of a helicopter air taxiway or, if not self-evident, the edges of a helicopter air taxiway should be identified with markers or markings.*



**6.2.22.2 Location -**

- a) A helicopter air taxiway centre line marking or flush in-ground centre line marker shall be located along the centre line of the helicopter air taxiway.
- b) Helicopter air taxiway edge markings shall be located along the edges of a helicopter air taxiway.
- c) Helicopter air taxiway edge markers shall be located at a distance of 1 m to 3 m beyond the edge of the helicopter air taxiway.

**6.2.22.3 Recommendation -** *Helicopter air taxiway edge markers should not be located at a distance of less than 0.5 times the largest overall width of the helicopter for which it is designed from the centre line of the helicopter air taxiway.*

**6.2.22.4 Characteristics -**

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

**Note:** *Where there is potential for a helicopter air taxiway to be confused with a helicopter ground taxiway, signage may be required to indicate the mode of taxi operations that are permitted.*

- c) A helicopter air taxiway 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.
- d) Helicopter air taxiway edge markers, where provided, shall be spaced at intervals of not more than 30 m on each side of straight sections and not more than 15 m on each side of curves, with a minimum of four equally spaced markers per section.
- e) Helicopter air taxiway edge markers shall be frangible.
- f) Helicopter air taxiway edge markers shall not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance of 1 m from the edge of the helicopter air taxiway and sloping upwards and outwards at a gradient of 5 % to a distance of 3 m beyond the edge of the helicopter air taxiway.

**6.2.22.5 Recommendation -**

- a) *Helicopter air taxiway edge markers should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance of 0.5 times the largest overall width of the helicopter for which it is designed from the centre line of the helicopter air taxiway, and sloping upwards and outwards at a gradient of 5 per cent.*
- b) *A helicopter air taxiway edge marker shall be of colour(s) that contrast effectively against the operating background. The colour red shall not be used for markers.*



- c) *If the helicopter air taxiway is to be used at night, helicopter air taxiway edge markers shall be either internally illuminated or retro-reflective.*

## 6.2.23 HELICOPTER STAND MARKINGS

### 6.2.23.1 Application -

- a) A helicopter stand perimeter marking shall be provided on a helicopter stand designed for turning. If a helicopter stand perimeter marking is not practicable, a central zone perimeter marking shall be provided instead if the perimeter of the central zone is not self-evident.
- b) For a helicopter stand intended to be used for taxi-through and which does not allow the helicopter to turn, a stop line shall be provided.

### 6.2.23.2 **Recommendation** - *Alignment lines and lead-in/lead-out lines should be provided on a helicopter stand.*

**Note:** *Helicopter stand identification markings may be provided where there is a need to identify individual stands.*

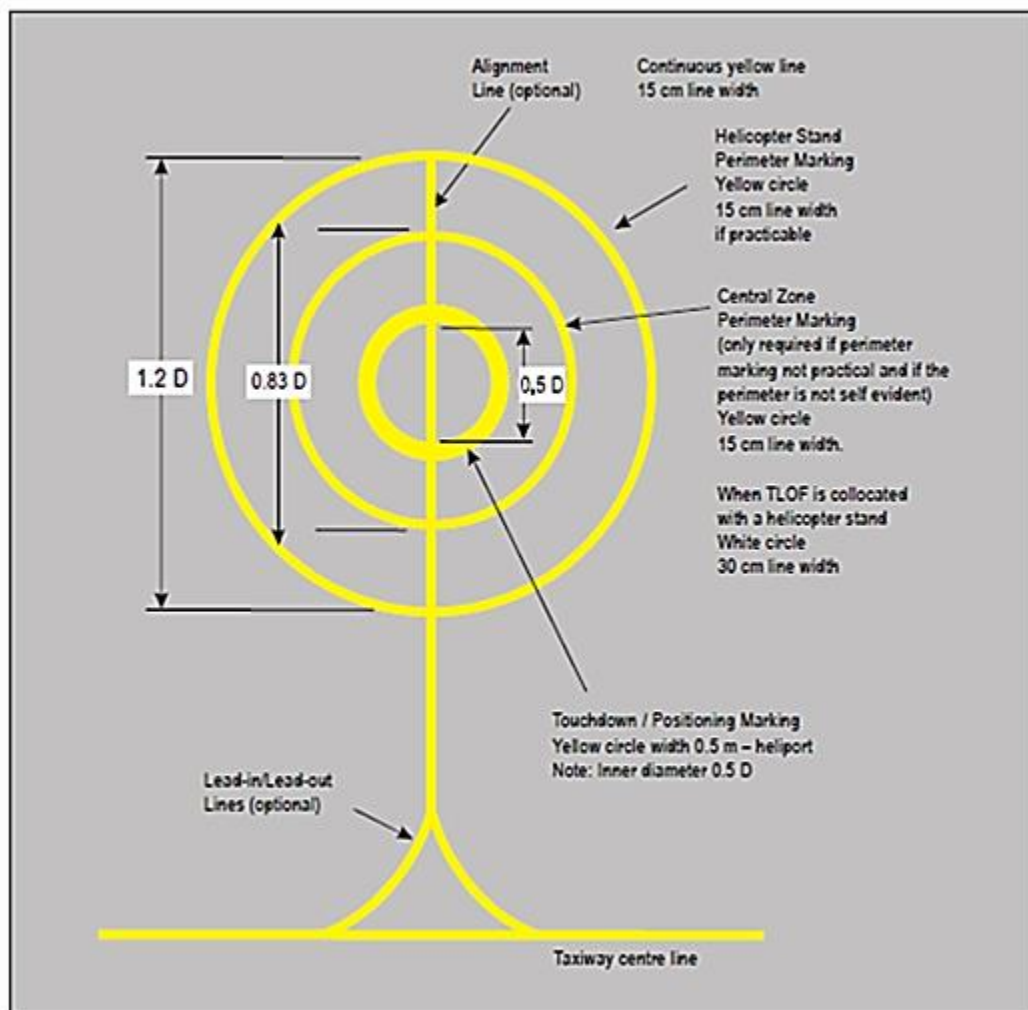
### 6.2.23.3 Location -

- a) A helicopter stand perimeter marking on a helicopter stand designed for turning or, a central zone perimeter marking, shall be concentric with the central zone of the stand.
- b) For a helicopter stand intended to be used for taxi-through and which does not allow the helicopter to turn, a stop line shall be located on the helicopter ground taxiway axis at right angles to the centre line.
- c) Alignment lines and lead-in/lead-out lines shall be located as shown

### 6.2.23.4 Characteristics -

- a) A helicopter stand perimeter marking shall be a yellow circle and have a line width of 15 cm.
- b) A central zone perimeter marking shall be a yellow circle and have a line width of 15 cm, except when the TLOF is collocated with a helicopter stand, the characteristics of the TLOF perimeter markings shall apply.
- c) For a helicopter stand intended to be used for taxi-through and which does not allow the helicopter to turn, a yellow stop line shall not be less than the width of the helicopter ground taxiway and have a line thickness of 50 cm.
- d) Alignment lines and lead-in/lead-out lines shall be continuous yellow lines and have a width of 15 cm.
- e) Curved portions of alignment lines and lead-in/lead-out lines shall have radii appropriate to the most demanding helicopter type the helicopter stand is intended to serve.
- f) Stand identification markings shall be marked in a contrasting colour so as to be easily readable.

**Note 1:** *Where it is intended that helicopters proceed in one direction only, arrows indicating the direction to be followed may be added as part of the alignment lines.*



**FIGURE 6-8: HELICOPTER STAND MARKINGS**

#### 6.2.24 FLIGHT PATH ALIGNMENT GUIDANCE MARKING

**6.2.24.1 Application (Recommendation)** - Flight path alignment guidance marking(s) should be provided at a heliport where it is desirable and practicable to indicate available approach and/or departure path direction(s).

**Note:** The flight path alignment guidance marking can be combined with a flight path alignment guidance lighting system described.

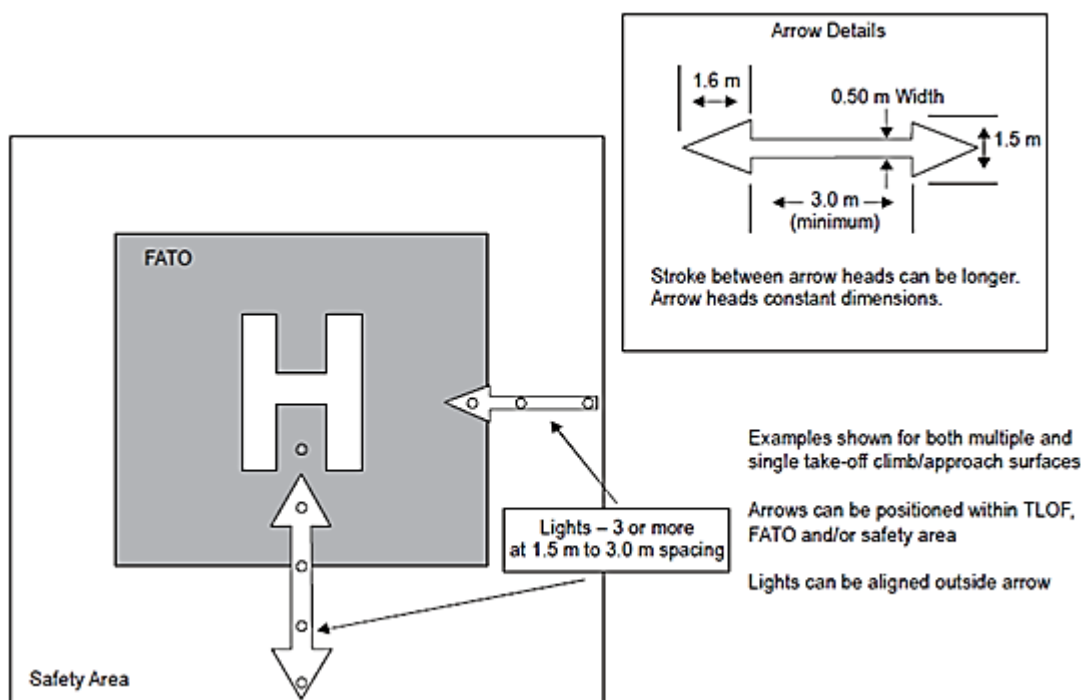
**6.2.24.2 Location** - The flight path alignment guidance marking shall be located in a straight line along the direction of approach and/or departure path on one or more of the TLOF, FATO, safety area or any suitable surface in the immediate vicinity of the FATO or safety area.



- 6.2.24.3 Characteristics** - A flight path alignment guidance marking shall consist of one or more arrows marked on the TLOF, FATO and/or safety area surface as shown. The stroke of the arrow(s) shall be 50 cm in width and at least 3 m in length. When combined with a flight path alignment guidance lighting system it shall take the form shown. which includes the scheme for marking 'heads of the arrows' which are constant regardless of stroke length

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

- 6.2.24.4 Recommendation** - The markings should be in a colour which provides good contrast against the background colour of the surface on which they are marked, preferably white.



## 6.3 LIGHTS

### 6.3.1 HELIPORT BEACON

#### 6.3.1.1 **Application (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.

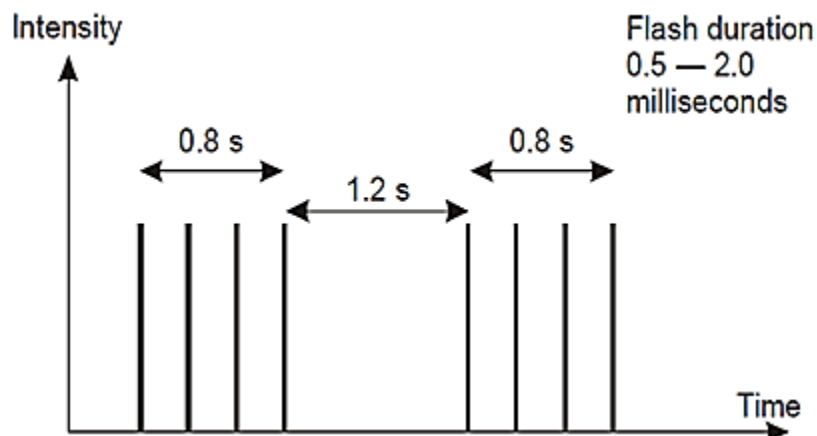
#### 6.3.1.2 **Location** - The heliport beacon shall be located on or adjacent to the heliport preferably at an elevated position and so that it does not dazzle a pilot at short range.

**Note:** A heliport beacon located here is likely to dazzle pilots at short range, it may be switched off during the final stages of the approach and landing.

#### 6.3.1.3 **Characteristics** -

- a) The heliport beacon shall emit repeated series of equi-spaced short duration white flashes in the format in Figure 6-10.
- b) The light from the beacon shall show at all angles of azimuth.

#### 6.3.1.4 **Recommendation** - The effective light intensity distribution of each flash should be as shown in Figure 6-10, Illustration 1.

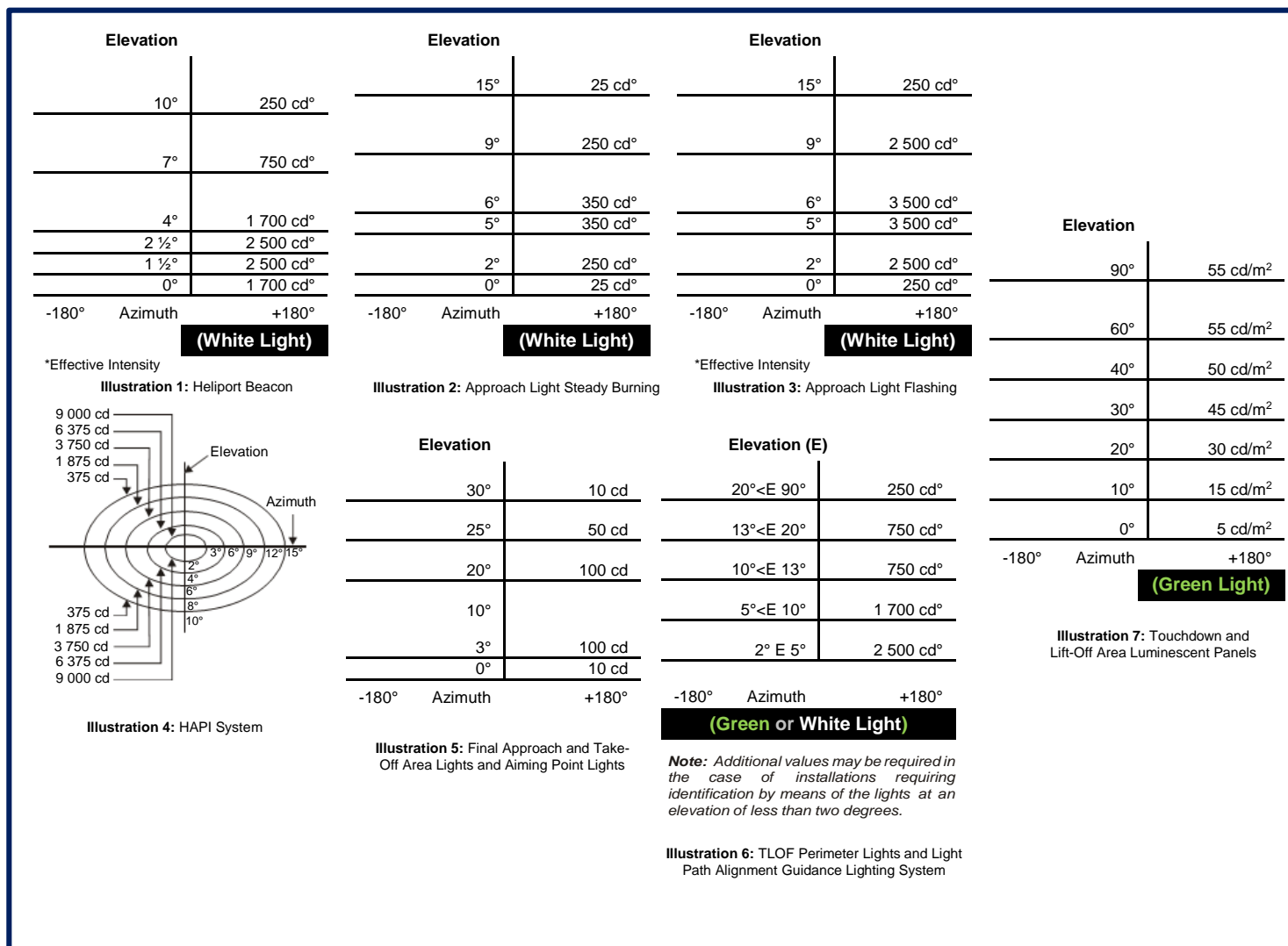


**FIGURE 6-10: HELIPORT BEACON FLASH CHARACTERISTICS**



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**FIGURE 6-11: ISOCANDELA DIAGRAM**



## 6.3.2 APPROACH LIGHTING SYSTEM

**6.3.2.1 Application (Recommendation)** - *An approach lighting system should be provided at a heliport where it is desirable and practicable to indicate a preferred approach direction.*

**6.3.2.2 Location** - The approach lighting system shall be located in a straight line along the preferred direction of approach.

### 6.3.2.3 Characteristics -

#### a) Recommendation -

- i. *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. 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.*

- ii. *The steady lights shall be omnidirectional white lights.*

- iii. *Sequenced flashing lights shall be omnidirectional white lights.*

- b) **Recommendation** - *The flashing lights should have a flash frequency of one per second and their light distribution should be as shown in Figure 5-11, Illustration 3. The flash sequence should commence from the outermost light and progress towards the crossbar.*

- c) **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:*

- i. *steady lights — 100 per cent, 30 % and 10 per cent; and*
- ii. *flashing lights — 100 per cent, 10 % and 3 per cent.*

## 6.3.3 FLIGHT PATH ALIGNMENT GUIDANCE LIGHTING SYSTEM

**6.3.3.1 Application (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).*

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

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

**6.3.3.3 Recommendation** - *If combined with a flight path alignment guidance marking, as far as is practicable the lights should be located inside the "arrow" markings.*



**6.3.3.4 Characteristics (Recommendation) -**

- a) *A flight path alignment guidance lighting system should consist of a row of three or more lights spaced uniformly 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.*

**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.*

- b) *The lights shall be steady omnidirectional inset white lights.*

**6.3.3.5 Recommendation -** *The distribution of the lights should be as indicated in Figure 6-11, Illustration 6.*

**6.3.3.6 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.*

**6.3.4 VISUAL ALIGNMENT GUIDANCE SYSTEM**

**6.3.4.1 Application (Recommendation) -** *A visual alignment guidance system should be provided to serve the approach to a heliport where one or more of the following conditions exist especially at night:*

- a) *obstacle clearance, noise abatement or traffic control procedures require a particular direction to be flown;*
- b) *the environment of the heliport provides few visual surface cues; and*
- c) *it is physically impracticable to install an approach lighting system.*

**6.3.4.2 Location -** *The visual alignment guidance system shall be located such that a helicopter is guided along the prescribed track towards the FATO.*

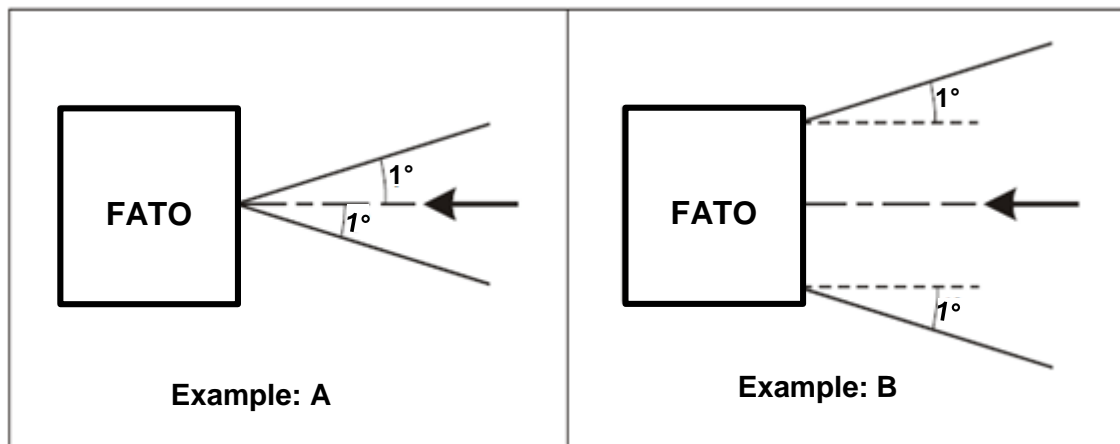
**6.3.4.3 Recommendation -**

- a) *The system should be located at the downwind edge of the FATO and aligned along the preferred approach direction.*
- b) *The light units shall be frangible and mounted as low as possible.*
- c) *Where the lights of the system need to be seen as discrete sources, light units shall be located such that at the extremes of system coverage the angle subtended between units as seen by the pilot shall not be less than 3 minutes of arc.*
- d) *The angles subtended between light units of the system and other units of comparable or greater intensities shall also be not less than 3 minutes of arc.*

**Note:** *Requirements of ICAO Annex 14, Vol. 2, Sub-Paragraphs 5.3.5.5 and 5.3.5.6 can be met for lights on a line normal to the line of sight if the light units are separated by 1 m for every kilometre of viewing range.*

#### 6.4.4 SIGNAL FORMAT

- a) The signal format of the alignment guidance system shall include a minimum of three discrete signal sectors providing "offset to the right", "on track" and "offset to the left" signals.
- b) The divergence of the "on track" sector of the system shall be as shown in Figure 6-12.
- c) The signal format shall be such that there is no possibility of confusion between the system and any associated visual approach slope indicator or other visual aids.
- d) The system shall avoid the use of the same coding as any associated visual approach slope indicator.
- e) The signal format shall be such that the system is unique and conspicuous in all operational environments.
- f) The system shall not significantly increase the pilot workload.



**FIGURE 6-12: DIVERGENCE OF THE "ON TRACK" SECTOR**

#### 6.4.5 LIGHT DISTRIBUTION -

- a) The usable coverage of the visual alignment guidance system shall be equal to or better than that of the visual approach slope indicator system with which it is associated.
- b) A suitable intensity control shall be provided so as to allow adjustment to meet the prevailing conditions and to avoid dazzling the pilot during approach and landing.

#### 6.4.6 APPROACH TRACK AND AZIMUTH SETTING

- a) A visual alignment guidance system shall be capable of adjustment in azimuth to within  $\pm 5$  minutes of arc of the desired approach path.
- b) The angle of the azimuth guidance system shall be such that during an approach the pilot of a helicopter at the boundary of the "on track" signal will clear all objects in the approach area by a safe margin.
- c) The characteristics of the obstacle protection surface specified in ICAO Annex 14, Vol. 2, Sub-Paragraph 5.3.6.23, Table 6-1 and Figure 6-13 shall equally apply to the system.

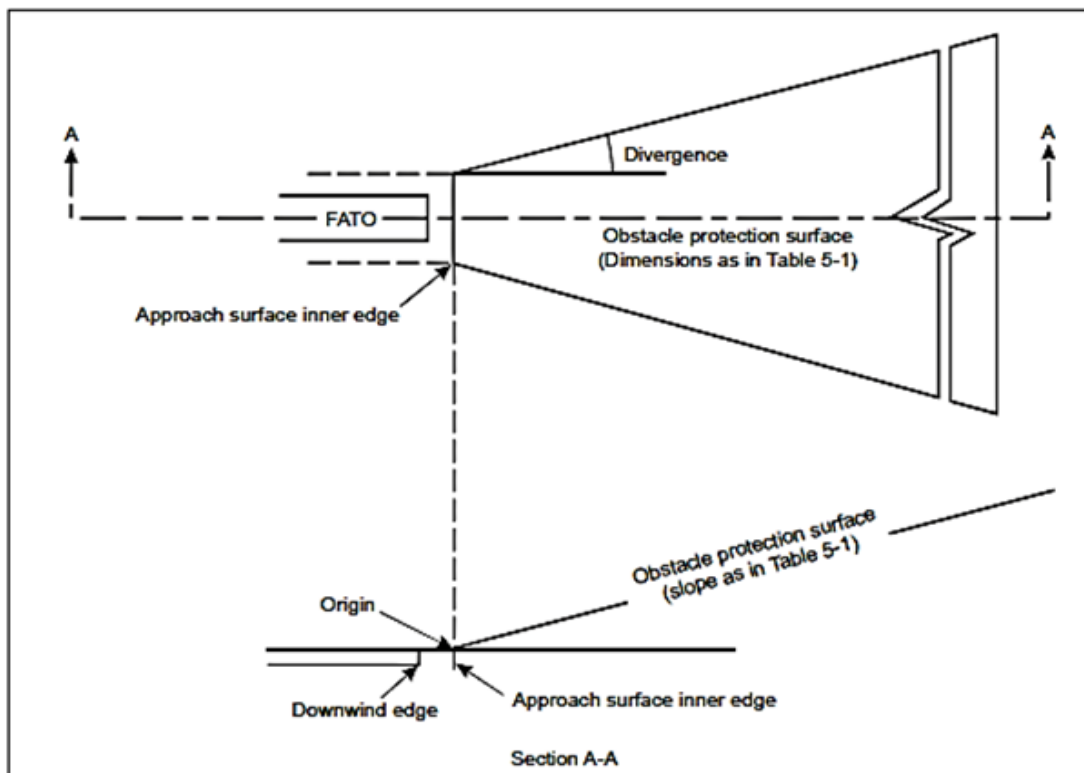
#### 6.4.7 CHARACTERISTICS OF THE VISUAL ALIGNMENT GUIDANCE SYSTEM

- a) In the event of the failure of any component affecting the signal format the system shall be automatically switched off.
- b) The light units shall be so designed that deposits of condensation, ice, dirt, etc., on optically transmitting or reflecting surfaces will interfere to the least possible extent with the light signal and will not cause spurious or false signals to be generated.

SURFACE AND DIMENSIONS	FATO	
Length of Inner Edge	Width of Safety Area	
Distance from End of FATO	3 m Minimum	
Divergence	10%	
Total Length	2 500 m	
Slope	PAPI	$A^a - 0.57^\circ$
	HAPI	$A^b - 0.65^\circ$
	APAPI	$A^a - 0.9^\circ$

<sup>a</sup> – As indicated in ICAO Annex 14, Volume 1, Figure 5-19.  
<sup>b</sup> – The angle of the upper boundary of the "below slope" signal.

**TABLE 6-1: DIMENSIONS AND SLOPES OF THE OBSTACLE PROTECTION SURFACE**



**FIGURE 6-13: OBSTACLE PROTECTION SURFACE FOR VISUAL APPROACH SLOPE INDICATOR SYSTEMS**

#### 6.4.8 VISUAL APPROACH SLOPE INDICATOR





**6.4.8.1 Application (Recommendation) -**

- a) *A visual approach slope indicator should be provided to serve the approach to a heliport, whether or not the heliport is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist especially at night:*
  - i. *obstacle clearance, noise abatement or traffic control procedures require a particular slope to be flown;*
  - ii. *the environment of the heliport provides few visual surface cues; and*
  - iii. *the characteristics of the helicopter require a stabilized approach.*
- b) *The standard visual approach slope indicator systems for helicopter operations shall consist of the following:*
  - i. *PAPI and APAPI systems conforming to the specifications contained in ICAO Annex 14, Volume I, Sub-Paragraphs 5.3.5.23 to 5.3.5.40 inclusive, except that the angular size of the on-slope sector of the systems shall be increased to 45 minutes; or*
  - ii. *helicopter approach path indicator (HAPI) system conforming to the specifications in ICAO Annex 14, Volume I, Sub-Paragraphs 5.3.6.6 to 5.3.6.21, inclusive.*

**6.4.8.2 Location -** A visual approach slope indicator shall be located such that a helicopter is guided to the desired position within the FATO and so as to avoid dazzling the pilot during final approach and landing.

**6.4.8.3 Recommendation -**

- a) *A visual approach slope indicator should be located adjacent to the nominal aiming point and aligned in azimuth with the preferred approach direction.*
- b) *The light unit(s) shall be frangible and mounted as low as possible.*

**6.4.9 HAPI SIGNAL FORMAT**

**6.4.9.1** The signal format of the HAPI shall include four discrete signal sectors, providing an "above slope", an "on slope", a "slightly below" and a "below slope" signal.

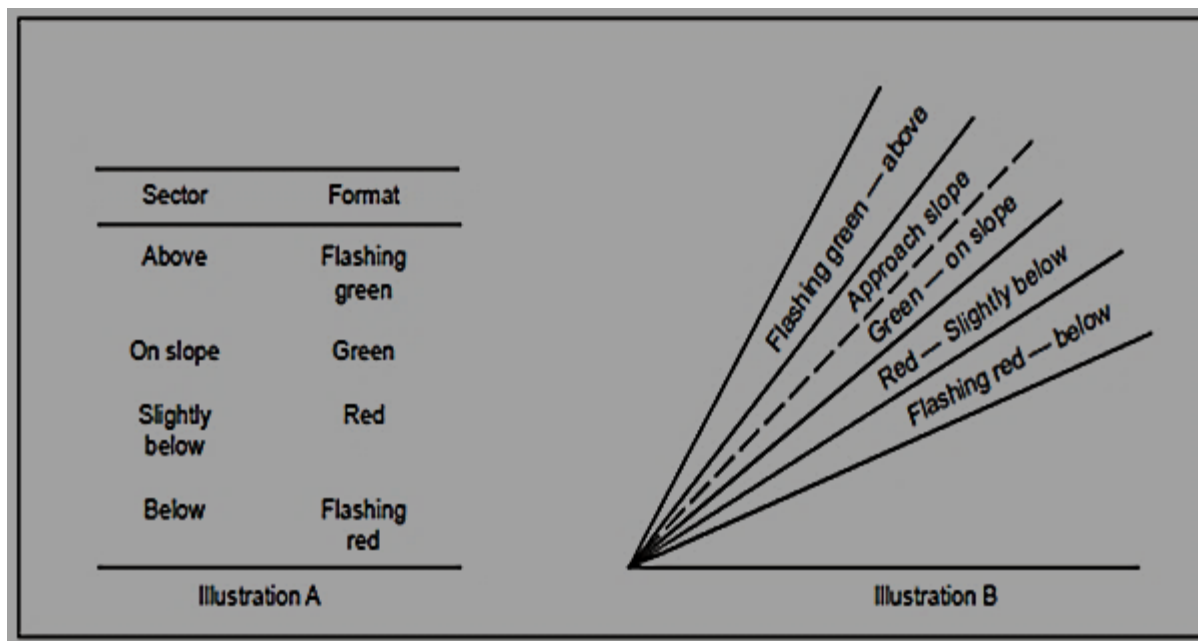
**6.4.9.2** The signal format of the HAPI shall be as shown in Figure 6-14, Illustrations A and B.

**Note:** Care is required in the design of the unit to minimize spurious signals between the signal sectors and at the azimuth coverage limits.

**6.4.9.3** The signal repetition rate of the flashing sector of the HAPI shall be at least 2 Hz.

**6.4.9.4 Recommendation -**

- a) *The on-to-off ratio of pulsing signals of the HAPI should be 1 to 1, and the modulation depth should be at least 80 per cent.*
- b) *The angular size of the "on-slope" sector of the HAPI shall be 45 minutes.*
- c) *The angular size of the "slightly below" sector of the HAPI shall be 15 minutes.*



**FIGURE 6-14: HAPI SIGNAL FORMAT**

#### 6.4.6 LIGHT DISTRIBUTION -

6.4.6.1 **Recommendation** - The light intensity distribution of the HAPI in red and green colours should be as shown in Figure 6-11, Illustration 4.

**Note:** A larger azimuth coverage can be obtained by installing the HAPI system on a turntable.

6.4.6.2 Colour transition of the HAPI in the vertical plane shall be such as to appear to an observer at a distance of not less than 300 m to occur within a vertical angle of not more than three minutes.

6.4.6.3 The transmission factor of a red or green filter shall be not less than 15% at the maximum intensity setting.

6.4.6.4 At full intensity the red light of the HAPI shall have a Y-coordinate not exceeding 0.320, and the green light shall be within the boundaries specified in Annex 14, Volume I, Appendix 1, 2.1.3.

6.4.6.5 A suitable intensity control shall be provided so as to allow adjustment to meet the prevailing conditions and to avoid dazzling the pilot during approach and landing.

#### 6.4.7 APPROACH SLOPE AND ELEVATION SETTING

6.4.7.1 A HAPI system shall be capable of adjustment in elevation at any desired angle between 1 degree and 12 degrees above the horizontal with an accuracy of  $\pm 5$  minutes of arc.

6.4.7.2 The angle of elevation setting of HAPI shall be such that during an approach, the pilot of a helicopter observing the upper boundary of the "below slope" signal will clear all objects in the approach area by a safe margin.



#### 6.4.8 CHARACTERISTICS OF THE LIGHT UNIT

6.4.8.1 The system shall be so designed that:

- a) in the event the vertical misalignment of a unit exceeds  $\pm 0.5$  degrees ( $\pm 30$  minutes), the system will switch off automatically; and
- b) if the flashing mechanism fails, no light will be emitted in the failed flashing sector(s).

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

6.4.8.3 **Recommendation** - A HAPI system intended for installation on a floating helideck should afford a stabilization of the beam to an accuracy of  $\pm 1/4$  degree within  $\pm 3$ -degree pitch and roll movement of the heliport.

#### 6.4.9 OBSTACLE PROTECTION SURFACE

**Note:** The following specifications apply to PAPI, APAPI and HAPI.

6.4.9.1 An obstacle protection surface shall be established when it is intended to provide a visual approach slope indicator system.

6.4.9.2 The characteristics of the obstacle protection surface, i.e. origin, divergence, length and slope, shall correspond to those specified in the relevant column of Table 6-1 and in Figure 6-13.

6.4.9.3 New objects or extensions of existing objects shall not be permitted above an obstacle protection surface except when, in the opinion of the appropriate authority, the new object or extension would be shielded by an existing immovable object.

6.4.9.4 Existing objects above an obstacle protection surface shall be removed except when, in the opinion of the appropriate authority, the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety of operations of helicopters.

6.4.9.5 Where an aeronautical study indicates that an existing object extending above an obstacle protection surface could adversely affect the safety of operations of helicopters, one or more of the following measures shall be taken:

- a) suitably raise the approach slope of the system;
- b) reduce the azimuth spread of the system so that the object is outside the confines of the beam;
- c) displace the axis of the system and its associated obstacle protection surface by no more than 5 degrees
- d) suitably displace the FATO; and
- e) install a visual alignment guidance system specified in 5.3.5.



6.4.10 **FINAL APPROACH AND TAKE-OFF AREA LIGHTING SYSTEMS FOR SURFACE-LEVEL HELIPORTS**

6.4.10.1 **Application** - Where a FATO is established at a surface-level heliport on ground intended for use at night, FATO 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.

6.4.10.2 **Location** - FATO 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.

6.4.10.3 **Characteristics** - FATO lights shall be fixed omnidirectional lights showing white. Where the intensity of the lights is to be varied the lights shall show variable white.

6.4.10.4 **Recommendation** - *The light distribution of FATO lights should be as shown in Figure 6-11, Illustration 5.*

6.4.10.5 **Recommendation** - *The lights should not exceed a height of 25 cm and should be inset when a light extending above the surface would endanger helicopter operations. Where a FATO is not meant for lift-off or touchdown, the lights should not exceed a height of 25 cm above ground or snow level.*

6.4.11 **AIMING POINT LIGHTS**

6.4.11.1 **Application (Recommendation)** - *Where an aiming point marking is provided at a heliport intended for use at night, aiming point lights should be provided.*

6.4.11.2 **Location** - Aiming point lights shall be collocated with the aiming point marking.

6.4.11.3 **Characteristics** - Aiming point lights shall form a pattern of at least six omnidirectional white lights as shown in Figure 6-6. The lights shall be inset when a light extending above the surface could endanger helicopter operations.

6.4.11.4 **Recommendation** - *The light distribution of aiming point lights should be as shown in Figure 6-11, Illustration 5.*

6.4.12 **TOUCHDOWN AND LIFT-OFF AREA LIGHTING SYSTEM**

6.4.12.1 **Application** -

- a) A TLOF lighting system shall be provided at a heliport intended for use at night.
- b) The TLOF lighting system for a surface-level heliport shall consist of one or more of the following:
  - i. perimeter lights; or
  - ii. floodlighting; or



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- iii. arrays of segmented point source lighting (ASPSL) or luminescent panel (LP) lighting to identify the TLOF when a) and b) are not practicable and FATO lights are available.
- c) The TLOF lighting system for an elevated heliport or helideck shall consist of:
  - i. perimeter lights; and
  - ii. ASPSL and/or LPs to identify the touchdown marking where it is provided and/or floodlighting to illuminate the TLOF.

*Note: At elevated 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 (LEDs) to identify the touchdown and heliport identification markings.*

**6.4.12.2**     **Recommendation** - TLOF ASPSL and/or LPs to identify the touchdown marking and/ or floodlighting should be provided at a surface-level heliport intended for use at night when enhanced surface texture cues are required.

**6.4.12.3**     **Location -**

- a) 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 edge. Where the TLOF is a circle the lights shall be:
  - i. located on straight lines in a pattern which will provide information to pilots on drift displacement; and
  - ii. 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.
- b) 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.
- c) 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.
- d) The TLOF perimeter lights shall be installed at a floating helideck, such that the pattern cannot be seen by the pilot from below the elevation of the TLOF when the helideck is level.
- e) 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.



- f) 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 % 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.
- g) 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 touchdown marking where it is provided or coincident with heliport identification marking.
- h) TLOF floodlights shall be located so as to avoid glare to pilots in flight 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 touchdown 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.

#### 6.4.12.4 Characteristics -

- a) The TLOF perimeter lights shall be fixed omnidirectional lights showing green.
- b) At a surface-level heliport, ASPSL or LPs shall emit green light when used to define the perimeter of the TLOF.

**6.4.12.5 Recommendation** - The chromaticity and luminance of colours of LPs should conform to Annex 14, Volume I, Appendix 1, 3.4. An LP shall have a minimum width of 6 cm. The panel housing shall be the same colour as the marking it defines.

**6.4.12.6 Recommendation** - The perimeter lights should not exceed a height of 25 cm and should be inset when a light extending above the surface could endanger helicopter operations.

**6.4.12.7 Recommendation** - When located within the safety area of a heliport or within the obstacle-free sector of a helideck, the TLOF floodlights should not exceed a height of 25 cm. The LPs shall not extend above the surface by more than 2.5 cm.

**6.4.12.8 Recommendation** - The light distribution of the perimeter lights should be as shown in Figure 5-11, Illustration 6.

**6.4.12.9 Recommendation** - The light distribution of the LPs should be as shown in Figure 5-11, Illustration 7. The spectral distribution of TLOF area floodlights shall be such that the surface and obstacle marking can be correctly identified.

**6.4.12.10 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. Lighting used to identify the touchdown marking should comprise a segmented circle of omnidirectional ASPSL strips showing yellow. The segments should consist of ASPSL strips, and the total length of the ASPSL strips should not be less than 50 % of the circumference of the circle.

**6.4.12.11 Recommendation** - If utilized, the heliport identification marking lighting should be omnidirectional showing green.



6.4.13 **WINCHING AREA FLOODLIGHTING**

6.4.13.1 **Application** - Winching area floodlighting shall be provided at a winching area intended for use at night.

6.4.13.2 **Location** - Winching area floodlights shall be located so as to avoid glare to pilots in flight or to personnel working on the area. The arrangement and aiming of floodlights shall be such that shadows are kept to a minimum.

6.4.13.3 **Characteristics** - The spectral distribution of winching area floodlights shall be such that the surface and obstacle markings can be correctly identified. The average horizontal illuminance should be at least 10 lux, measured on the surface of the winching area.

6.4.14 **TAXIWAY LIGHTS**

**Note:** The specifications for taxiway centreline lights and taxiway edge lights in Annex 14, Volume I, 5.3.17 and 5.3.18, are equally applicable to taxiways intended for ground taxiing of helicopters.

6.4.15 **Visual Aids for Denoting Obstacles:**

**Note:** The specifications for marking and lighting of obstacles included in Annex 14, Volume I, Chapter 6, are equally applicable to heliports and winching areas.

6.4.16 **FLOODLIGHTING OF OBSTACLES**

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

6.4.16.2 **Location** - Obstacle floodlights shall be arranged so as to illuminate the entire obstacle and as far as practicable in a manner so as not to dazzle the helicopter pilots.

6.4.16.3 **Characteristics (Recommendation)** - Obstacle floodlighting should be such as to produce a luminance of at least 10 cd/m<sup>2</sup>.






GUYANA CIVIL AVIATION AUTHORITY  
GUYANA AVIATION STANDARDS AND RECOMMENDATIONS  
FOR LICENCED (DOMESTIC) HELIPORT

DOC. #:  
GCAA/SRPLH/2019-001

**APPENDIX: 1**  
**AERODROME APPLICATION FORM**

*(This form is used for all aerodromes, including, heliports/helipads/helidecks)*

		GUYANA CIVIL AVIATION AUTHORITY		FORM NO:	
		APPLICATION FOR AERODROME LICENCE		GCAA/AGA/006-R1	
<b>1. PARTICULARS OF OWNER</b> (GIVE DETAILS AS REQUIRED TO BE SHOWN ON THE LICENCE)					
NAME OF OWNER/OPERATOR		ADDRESS OF OWNER/OPERATOR			
<b>2. PARTICULARS OF AERODROME</b>					
NAME OF AERODROME		REGION	POSITION (MAGNETIC COORDINATES)	LONGITUDE	LATITUDE
LENGTH	WIDTH	OBSTRUCTIONS			
		<input type="checkbox"/> YES <input type="checkbox"/> NO    If Yes, state: _____			
<b>3. PARTICULARS OF AIRCRAFT</b> (PROPOSED AIRCRAFT THAT WILL BE OPERATING AT THE AERODROME)					
TYPE		MODEL		MTOW OF LARGEST AIRCRAFT	
(a)		(a)			
(b)		(b)			
(c)		(c)			
(d)		(d)			
(e)		(e)			
<b>4. CLASSIFICATION OF AERODROME</b>					
<input type="checkbox"/> PUBLIC	<input type="checkbox"/> CARGO	<input type="checkbox"/> MEDIVAC	<input type="checkbox"/> DAY	<input type="checkbox"/> NIGHT	<input type="checkbox"/> HELIPORT
<input type="checkbox"/> STOLPORT	<input type="checkbox"/> PRIVATE	<input type="checkbox"/> TRAINING	<input type="checkbox"/> AERIAL WORK	<input type="checkbox"/> IFR	<input type="checkbox"/> VFR
<input type="checkbox"/> LAND	<input type="checkbox"/> WATER	<input type="checkbox"/> PERMANENT	<input type="checkbox"/> TEMPORARY		
<b>5. PARTICULARS OF APPLICANT</b> (IF DIFFERENT FROM OWNER)					
State: _____					
_____					
_____					
_____					



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

<b>6. APPROVALS FROM MINISTRY</b>	
<i>(GIVE DETAILS OF THE APPROVALS OBTAINED FROM THE MINISTRIES AS INDICATED BELOW. MENTION DETAILS OF OBJECTION RAISED, IF ANY)</i>	
NAME OF MINISTRY	APPROVAL REFERENCE
(a)	(a)
(b)	(b)
(c)	(c)
(d)	(d)
(e)	(e)
<b>7.</b> Are the safe guarding measures taken with local planning ministry to control new construction in the vicinity of the aerodrome which may cause an obstacle? <input type="checkbox"/> YES <input type="checkbox"/> NO	
<b>8.</b> Attach any other information you would consider relevant to this application. Enclosure:     	
<b>9. APPLICANT'S DECLARATION</b>	
I hereby declare that the foregoing information is correct in every respect and to the best of my knowledge:  <div style="display: flex; justify-content: space-between; margin-top: 20px;"><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(APPLICANT'S NAME)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(SIGNATURE)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(DATE)</div></div>	
<b>10. GCAA USE ONLY</b>	
Application approved: <input type="checkbox"/> YES <input type="checkbox"/> NO    If "NO", state reason(s): _____   	
<b>AERODROME INSPECTOR PROCESSING APPLICATION</b>	
<div style="display: flex; justify-content: space-between; margin-top: 20px;"><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(INSPECTOR'S NAME)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(SIGNATURE AND STAMP)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(DATE)</div></div>	
<b>CHECKED BY CHIEF INSPECTOR ANS/AGA</b>	
<input type="checkbox"/> ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE    If "Not Acceptable", state reason(s): _____   	
<div style="display: flex; justify-content: space-between; margin-top: 20px;"><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(CHIEF INSPECTOR'S NAME)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(SIGNATURE AND STAMP)</div><div style="width: 30%; border-bottom: 1px solid black; text-align: center;">(DATE)</div></div>	



## APPENDIX: 2 HELIPORT/HELIDECK INITIAL AND PERIODIC INSPECTION CHECKLIST

**(Note: The following checklist indicates in general terms the minimum number of heliport/helideck physical characteristics which the Guyana Civil Aviation Authority considers should be examined during both initial inspections for grant of licence and also for periodic surveys to confirm that there has been no alteration or deterioration in condition.)**

1. Name (Heliport): \_\_\_\_\_
2. Location (Coordinates): \_\_\_\_\_
3. Height (AGL / MSL): \_\_\_\_\_
4. Structural Strength: \_\_\_\_\_
5. Landing Area (dimension): \_\_\_\_\_
6. Surface Condition - Friction: \_\_\_\_\_ Drainage: \_\_\_\_\_
7. Obstruction(s): \_\_\_\_\_ ☐ YES ☐ NO
8. Windsock: \_\_\_\_\_ ☐ YES ☐ NO
9. Heliport Name Marking (if required): \_\_\_\_\_
10. Access Points for Passengers: \_\_\_\_\_
11. Heliport Beacon (if required): \_\_\_\_\_
12. Identification Marks (H) Orientation: \_\_\_\_\_ Colour: \_\_\_\_\_ Aiming Circle: \_\_\_\_\_
13. Landing Area Markings: \_\_\_\_\_ Colour: \_\_\_\_\_
14. Landing Area Lighting: \_\_\_\_\_ Perimeter: \_\_\_\_\_ Colour: \_\_\_\_\_ Floodlights: \_\_\_\_\_
15. Heliport for DAY/NIGHT Operations: \_\_\_\_\_
16. Fire Extinguishers: \_\_\_\_\_
17. Foam Application System (if required): \_\_\_\_\_
18. Fireman's Equipment: \_\_\_\_\_
19. Tie-Down Points: \_\_\_\_\_
20. Scales for Baggage Weighing: \_\_\_\_\_
21. Safety Net (Helideck): \_\_\_\_\_
22. Rescue Equipment Box, including (Tick appropriately): ☐ Aircraft Crash Axe ☐ Large Axe ☐ Crowbar
23. ☐ Heavy Duty Hawksaw and Spare Blades ☐ Large Bolt Croppers (Cutters)
24. Helicopter Refueling: \_\_\_\_\_
25. Heliport used by: \_\_\_\_\_
26. Type of Helicopter (s): \_\_\_\_\_
27. Remarks: \_\_\_\_\_

\_\_\_\_\_  
(INSPECTOR'S NAME)

\_\_\_\_\_  
(SIGNATURE AND STAMP)

\_\_\_\_\_  
(DATE)



## APPENDIX: 3 HELIPORT/HELIDECK PERIODIC INSPECTION CHECKLIST

(Note: The following checklist indicates in general terms the minimum number of heliport/helideck physical characteristics which the Guyana Civil Aviation Authority considers should be examined during periodic surveys to confirm that there has been no alteration or deterioration in condition.)

1. **General Information -**

- a) Name (Heliport): \_\_\_\_\_
- b) Location (Coordinates): \_\_\_\_\_
- c) Height (AGL / MSL): \_\_\_\_\_

2. **Helideck Dimensions -**

- a) D-Value as Measured: \_\_\_\_\_
- b) Declared D-Value: \_\_\_\_\_
- c) Deck Shape: \_\_\_\_\_
- d) Scale Drawings of Deck Arrangement: \_\_\_\_\_

3. **Deck Landing Area Conditions -**

- a) Type of Surface, Condition, Friction, Contaminant Free: \_\_\_\_\_
- b) Fuel Retention: \_\_\_\_\_
- c) Deck Landing Area Net: \_\_\_\_\_
- d) Perimeter Safety Netting: \_\_\_\_\_
- e) Tie-Down Points: \_\_\_\_\_

4. **Environment -**

- a) Turbine and Other Exhausts: \_\_\_\_\_
- b) Hot and Cold Gas Emissions: \_\_\_\_\_
- c) Turbulence Generators: \_\_\_\_\_
- d) Flares: \_\_\_\_\_
- e) Emergency Gas Release Systems: \_\_\_\_\_
- f) Adjacent Fixed/Mobile/Vessel Exhausts, Gas Emissions, Flares, and Turbulence Generators: \_\_\_\_\_

5. **Obstacle Protected Surfaces (Minima) -**

- a) Obstacle Free Sector (210°): \_\_\_\_\_
- b) Limited Obstacle Sector (150°): \_\_\_\_\_
- c) Falling 5:1 Gradient: \_\_\_\_\_
- d) Note if a) or c) above are swung from normal axis: \_\_\_\_\_

**Visual Aids -**

- a) Deck surface: \_\_\_\_\_
- b) General condition of Painted Markings: \_\_\_\_\_
- c) Location of H: \_\_\_\_\_
- d) Aiming Circle: \_\_\_\_\_
- e) Safe Landing Area Perimeter Line – Relationship to Chevron: \_\_\_\_\_
- f) D-value marked within Perimeter Line: \_\_\_\_\_

6. Remarks: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(INSPECTOR'S NAME)

\_\_\_\_\_  
(SIGNATURE AND STAMP)

\_\_\_\_\_  
(DATE)



GUYANA CIVIL AVIATION AUTHORITY  
GUYANA AVIATION STANDARDS AND RECOMMENDATIONS  
FOR LICENCED (DOMESTIC) HELIPORT

DOC. #:  
GCAA/SRPLH/2019-001

## APPENDIX: 4 OFFSHORE HELIDECK INSPECTION CHECKLIST

### NOTES

- The checklist below indicates in general terms the minimum number of offshore helideck physical characteristics which the Guyana Civil Aviation Authority considers and should be examined for granting of licence and also during periodic surveys. Any additional remarks/comments/information needed to be stated, same may be done on additional sheet(s), and referenced attached to this form.
- Non-compliances:** Record each non-compliance with a note number and summarize at the end of the checklist in the Summary of Non-Compliances.
- Inspection Requirements:** Annual Checks should be recorded on the form and retained.

### REFERENCES

The inspection specifications specified in this form incorporate requirements from the following documents:

- ICAO Annex 14 Volume II Heliports, 4th edition, July 2013 (referenced as ICAO).
- ICAO Document 9261-AN/903 Heliport Manual, 3rd edition, 1995 (referenced as HM).

SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
<b>A. GENERAL HELIDECK INFORMATION</b>						
1.	Name of Installation / Vessel					
2.	Type					
3.	Owner					
4.	Previous Report (if available)					
5.	'D' Value (in meters)	ICAO 3.3.3				
6.	Helideck Height (in feet [for mobiles give variable range and normal operating height])					
7.	Installation/Vessel Identification (Locations of name, full name displayed, size of letters, background, illumination, clearly visible from air)	ICAO 5.2.11				
<b>B. HELIDECK SURFACE</b>						
8.	Colour	ICAO 5.2.13.3				
9.	Condition (Both paint and cleanliness)	ICAO 5.2.13				
10.	Non slip characteristics (Estimate)	ICAO 5.2.13.3				
11.	Last Friction Test (Date and result – if applicable)					
12.	Gutter or raised curb (Give detail. Around all of the perimeter)					
13.	Drainage (Sufficient. Number of down pipes. Slope. Debris filter fitted.)	ICAO 3.1.5 HM 2.3.1.9				
14.	Deck sealed		CAP 3.46			
15.	Aircraft tie-down points (Location, quantity, flash, bar diameter .22m, condition)		CAP 3.46			
<b>C. HELIDECK DIMENSIONS</b>						
16.	Overall Helideck (Dimensions in meters)	ICAO 3.3.4				
17.	Safe landing area (Dimension. Contains D circle)	ICAO 3.3.3				
18.	Run off area (Dimensions)					



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
D. HELIDECK MARKINGS						
19.	Installation / Rig:					
	a) State name painted on deck	ICAO 5.2.11				
	b) State Height 1.5m, colour-white, position, outlined – [Aluminum Decks only]	ICAO 5.2.11.6				
	c) State Are other names on deck e.g. Block No. Oil Company, Logo? If so give details)	ICAO 5.2.11.6				
20.	Perimeter line Colour white, width .3m, location)	ICAO 5.2.9				
21.	Aiming circle (Colour – yellow, width 1m, inner diameter 0.5 "D"), location (0.1 "D" outboard)	ICAO 5.2.8				
22.	Chevron (For obstacle clearances - Length/width, 0.79m / 0.10m, colour – black, angle 210 degrees, location)	ICAO 5.2.12	HM 5.9			
23.	Actual "D" Value (Height, 0.1m, Colour black, location, inboard of chevron) (Does it match physical measurement)	ICAO 5.2.4	HM 5.9			
24.	Perimeter "D" Value (Value, quantity3, colour white, height 0.6m, location, orientation)	ICAO 5.2.4				
25.	"H" (size 4 x 3 x .75m) – (location, orientation [concentric with bisector] swung ± 15° max.)	ICAO 5.2.2.8	HM 5.3			
26.	Max allowable mass (value, size 0.9m, colour white, location. Design load scales confirm value)	ICAO 5.2.3				
27.	Prohibited Landing Sector (If used, provide location, angle, colours red/white batching, reason)	ICAO 5.2.14	HM 5.11			
28.	Passenger Access Route (A 36" wide walkway should be marked from the aiming circle to the <b>primary</b> access route.)	HM 1.4.4.3 – 1.4.4.5				
29.	Stairwell Opening – (A 3' wide solid red/white hash marked rectangular border should be used to mark the primary stairway opening. ([Individual Company Option])					
E. SURFACE NET (NOT REQUIRED IN ALL AREAS, IF SURFACE FRICTION IS ADEQUATE)		ICAO 3.3.15				
30.	Material (Recommend sisal [not Polypropylene])					
31.	Type					
32.	Coverage: (Covers aiming circle, clear of name and "t" value)					
33.	Age / Condition					
34.	Rope Diameter					
35.	Mesh Size					
36.	Net Size					
37.	Tension (2225N)					
38.	Tie-Down Points					
39.	Method of Securing					
F. PERIMETER SAFETY NET						
40.	Material	HM 1.4.4.1				
41.	Width from Deck Edge	HM 1.4.4.1				
42.	Condition / Securely Attached	HM 1.4.4.1				
43.	Last Drop Load Test (75kgs)	HM 1.4.4.1				
44.	Hammock Effect (Nil bounce effect)	HM 1.4.4.2				
45.	Drop Down Areas Protected	HM 1.4.4.2				
46.	Slope (Slope at least 10 degrees [Highest point above deck level: 250mm - Covers drop down areas (unless adequate structural protection exists)])	HM 1.4.4.1				



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
G. PERIMETER LIGHTING						
47.	Colour (Green)	ICAO 5.3.9.13				
48.	Serviceability ( <i>all working, brightness, condition of lens</i> )	ICAO 5.3.9.3				
49.	Height and Distance Apart (<255mm, <3m) ( <i>Height not more than 25cm</i> )	ICAO 5.3.9.6				
50.	Power Rating <i>Candelas 25, (Connected to emergency power supply)</i>					
51.	Location	ICAO 5.3.9.5				
52.	Limit of Safe Landing area ( <i>Have red lights been temporarily employed to delineate unsafe sectors? If so, state how the situation is going to be rectified.</i> )					
53.	Switching ( <i>Controlled from Radio Room/ Bridge or HLO</i> )					
H. FLOOD LIGHTING						
54.	Position, Height and Quality ( <i>position, quantity, height, adequate illumination brightness meets 10 lux and 8:1 ratio</i> )	ICAO 5.3.9.18 3.3.9.23				
55.	Serviceability ( <i>all working</i> )	ICAO 5.3.9.3				
56.	Dazzle Protection ( <i>What method is employed to avoid dazzle and type of unit?</i> )	ICAO 5.3.9.12				
57.	Switching ( <i>controlled from Radio Room by HLO</i> )					
58.	Emergency Power Supply ( <i>in addition to the perimeter lights, are the floods connected to the emergency power supply</i> )					
I. GENERAL LIGHTING						
59.	Installation Floodlighting ( <i>All floodlighting angles so as not to dazzle pilots</i> )	ICAO 5.3.9.12				
60.	Structures > 15m Above Deck Level ( <i>Omni-directional red lights every 10m above deck level. To include all crane booms</i> )	HM 5.16.3				
61.	Highest Point ( <i>Omni-directional, colour, intensity</i> )	HM 5.16.3				
62.	Light Pollution					
J. OBSTRUCTION MARKING AND LIGHTING						
63.	Obstructions ( <i>List and give colour scheme</i> )	ICAO 5.3.13	HM 5.16.1			
64.	Crane Colors ( <i>Colour [if close to helideck or 150° sector boundary]</i> )		HM 5.16.2			
65.	Lighting ( <i>Give detail</i> )	ICAO 5.3.1	HM 5.16.3			
K. STATUS LIGHTS (BEACON)						
66.	Visible from all Approach Directions	ICAO 5.3.2.4				
67.	Connected to Emergency Supply/UPS		HM 5.16.8			
68.	Switching ( <i>Automatic as well as manual activation</i> )		HM 5.16.8			
L. OBSTRUCTION ENVIRONMENT						
69.	210° Sector Obstructions ( <i>State items, location and height, max 0.25m within 1000m above deck level</i> )	ICAO 4.1.24 HM 3.1.7	HM 4.1			
70.	150° Sector Obstructions ( <i>State items, location and height above deck level</i> ):	ICAO 4.2.15-16				
	a) Up to 0.62 "D" (or 0.12 from edge of safe landing area) = 0.05"D"					
	b) 0.62-0.83 "D" (or 0.33 from edge of safe landing area_ = gradient of 1:2					
71.	180° 5:1 Falling Gradient (11.4) for obstructions below the helideck level ( <i>State items, location, distance from the edge of netting and height below deck level</i> )					





**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
M. TURBULENCE						
72.	Structure <i>(State items likely to cause turbulence)</i>	ICAO 3.1.64 HM 1.4.1				
73.	Hot Emissions <i>(State emissions, e.g. Flares, turbine exhausts)</i>	HM 1.4.1				
74.	Cold Emissions <i>(State emissions e.g. Vents, blow down)</i>	HM 1.4.1				
75.	Air Gap Beneath Helideck <i>(State height and obstruction environment)</i>	HM 1.4.1				
76.	Prevailing Wind <i>(State any restrictions in landing / to weight / approach-departure direction)</i>	ICAO 3.3.7				
N. REFUELING SYSTEM						
77.	General Comments Only <i>(Use Refueling System Inspection Form)</i>	ICAO 3.2.1 HM 2.1.3.6				
O. ACCESS POINTS						
78.	Locations	ICAO 3.2.1				
79.	Handrails <i>(foldable if obstacle height? Height)</i>	HM 2.1.3.6				
80.	Safety Notices <i>(Recommend tail rotor, clear deck, hearing protection, in dual language if necessary)</i>		CAP 3.5.6 (note)			
81.	Control of Passengers <i>(System employed to prevent inadvertent access to helideck, frangible chains at secondary access points)</i>					
P. FIRE FIGHTING EQUIPMENT						
82.	Foam Monitors <i>(Quantity, type - If non aspirated, state what aspirated back up available)</i>	ICAO 6.2.7 ICAO 6.2.3				
83.	Delivery Rate <i>(Liters/ min of applied foam)</i>	ICAO 6.2.6				
84.	Concentrate <i>(Capacity of tank, quantity in tank, type, percentage [marked on container])</i>					
85.	Certificate of Conformity <i>(Certificate of Conformity, test report on concentrate, water and produced foam if applicable)]</i>	HM 6.3.4				
86.	Hydrant Points <i>(Quantity, location)</i>					
87.	Back-Up Concentrate <i>(Quantity)</i>		HM 6.6			
88.	Hand Lines <i>(Quantity, location, hand controlled spray / jet nozzles)</i>					
89.	Foam Hand Branch <i>(Quantity, location, delivery rate)</i>		HM 6-2.6			
90.	Foam Inductors <i>(Quantity, location, concentrate – quantity, percentage setting, connection)</i>		HM 6.3.2			
91.	Dry Powder (DP) <i>(No. and capacity of each unit, location, access to helideck, last test date)</i>	HM 6.6.1	HM 6.4.2			
92.	CO <sup>2</sup> <i>(No. and capacity of each unit, location, access to helideck, lance, last test date)</i>	HM 6.6.1				
93.	Back Up DP and CO <sup>2</sup> <i>(100% back-up req. No. and capacity location)</i>		HM 6.6			
Q. RESCUE EQUIPMENT		ICAO 6.2.8				
94.	Rescue Equipment Box(es):					
	a) <i>(location, quantity, condition, lighting)</i>		HM 6.7.4			
	b) <i>Layout of the equipment</i>		HM 6.7.3			
	c) <i>Accessibility from all helidecks access points)</i>					



**GUYANA CIVIL AVIATION AUTHORITY**  
**GUYANA AVIATION STANDARDS AND RECOMMENDATIONS**  
**FOR LICENCED (DOMESTIC) HELIPORT**

DOC. #:  
GCAA/SRPLH/2019-001

SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
R. CHECKLIST		HM 6.9 Table 6-5				
95.	Adjustable Wrench ( <i>quantity, location</i> )					
96.	Large Rescue Axe ( <i>non-wedge or aircraft type</i> )					
97.	Bolt Cutters ( <i>quantity, location</i> )					
98.	Large Crowbar ( <i>quantity, location</i> )					
99.	Grab or Salving Hook ( <i>quantity, location</i> )					
100.	Heavy Duty Hacksaw ( <i>quantity, location</i> )					
101.	Heavy Duty Blades ( <i>quantity, location</i> )					
102.	Fire Resistant Blanket ( <i>quantity, location</i> )					
103.	Ladder ( <i>quantity, location</i> )					
104.	Life-Line / Rescue Harness ( <i>quantity, location</i> )					
105.	Side Cutting Pliers ( <i>quantity, location</i> )					
106.	Set of Assorted Screwdrivers ( <i>quantity, location</i> )					
107.	Harness Knife c/w Sheath ( <i>one (1) per Deck Crew</i> )					
108.	Self-Contained Breathing Apparatus ( <i>quantity, location, storage, spare bottles</i> )					
109.	Portable Safety Lamp ( <i>quantity, location, operating life</i> )					
S. PROTECTIVE CLOTHING (RFF)		HM 6.9				
110.	Stowage Type ( <i>location, condition</i> )					
111.	Helmet with Visor ( <i>quantity, type, BS/EN code, condition</i> )					
112.	Gloves ( <i>quantity, type, PREN code, condition</i> )					
113.	Boots ( <i>quantity, type, PREN code, condition</i> )					
114.	Fire Tunic and Trouser or One Piece ( <i>quantity, type, PREN code, condition</i> )					
T. ADDITIONAL EQUIPMENT		CAP A.8 (NOTE 2) 9				
115.	Chocks ([ <i>Sandbag type best on decks with a deck net</i> ]) ( <i>quantity</i> )					
116.	Tie Down Strops / Ropes ( <i>type, quantity</i> )					
117.	Scales for Baggage, Freight, Passengers ( <i>type, max. wt, calibration date</i> )					
118.	Helicopter Start Unit ( <i>type, location, voltage. Can lead reach to a/c in any position?</i> )					
119.	Equipment for Showing Passenger Brief ( <i>type, location, dual language or subtitles?</i> )					
120.	Prohibited Landing Marker					
121.	Windsock ( <i>location, condition, illumination, in clear air?</i> )					
U. RADIO EQUIPMENT		HM 8.4				
122.	VHF Main ( <i>Call sign, location, quantity, [min 2] ATTS</i> D approved details, connected to emergency supply/ups)		CAP 6.34			
123.	VHF Portable ( <i>quantity, suitable for purpose</i> )					
124.	NDB (ATSSD approved, details, indent, frequency)		HM 8.4.4			
125.	AIP ENR 1 – 15 ( <i>available</i> ) ( <i>if not BHAB to supply</i> )					
126.	RX Log ( <i>details, written or electromagnetic, kept for 28 days</i> )					




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SUBJECT/PARTICULARS		ICAO REF	REF/FREQ	SATISFACTORY		REMARKS
				YES	NO	
V. WEATHER EQUIPMENT		HM 8.2				
127.	Anemometer (location, calibration date, in clear air)					
128.	Air Temperature (location)					
129.	Precision Temperature (location of a sensor relative to helideck level, calibration date?)					
130.	Visibility, Cloud Base and Cover (give details of equipment if available)					
131.	Sea State (give details of equipment if available)					
132.	Pitch / Roll / Heave (type of equipment [Can the equipment record the max figure over the preceding 10 mins?])					
133.	Location of the Readouts (Can the radio operator readily refer to all the weather information?)					
134.	Are Helideck / Bridge Personnel knowledgeable on operator weather limitations and also on adverse weather policy?					
135.	AWOS? (provide telephone or comms link available)					
W. MISCELLANEOUS						
136.	Helicopter Emergency Diagrams (location, which types are covered?)					
137.	Emergency Procedures (is there an Emergency Procedures Manual detailing helicopter emergencies?)					HM 6.11
X. HELIDECK CREW (NOTE: OPITO OR EQUIVALENT STANDARD)						
138.	Helideck Landing Officer (HLO):					
	a) Total number, number per shift, names					
	b) Completed:					
	(i) Basic Offshore Safety Induction and Emergency Training program					
	(ii) Further Offshore Emergency Training programme					
	c) Previously served as HLA or have previous suitable experience					
	d) Have a Helicopter Refueling Certificate meeting industry standard					
	(e) Have an RT licence (unlawful to use equipment without being in possession of Offshore Aeronautical RT certificate)					
	(f) Possess current Emergency Helideck Team Member Certificate					
139.	(g) Have completed an initial HLO training programme					
	Helideck Assistant (HAD):					
	a) Total number, number per shift, names					
	b) Completed:					
	(i) Basic Offshore Safety Induction and Emergency Training program					
	(ii) Further Offshore Emergency Training programme					
	c) Have previous experience of handling helicopters					
d) HAD – Have completed an initial training programme covering routine operations (including refueling)						
(e) Have a Helicopter Refueling Certificate meeting industry standard where required						



## APPENDIX: 5 SAMPLE LICENCE & OPS SPECS (HELIPORT/HELIDECK)

<p>File Ref. No: <b>GCAA/AGA/</b></p>	 <p><b>GUYANA CIVIL AVIATION AUTHORITY</b></p> <p><b>AERODROME LICENCE</b> <b>HELIPORT/HELIDECK</b></p>	<p>GCAA Form No: <b>GCAA/AGA/ 003-H</b></p> <p>Licence No: <b>/2019</b></p>
<p>Name of Aerodrome:</p> <p>Name of Licensee:</p> <p>Position:                      Latitude: -                      Longitude: -</p> <p>Address:</p>  <p>Aerodrome Reference Code:</p> <ol style="list-style-type: none"><li>1. <i>The Licence is issued pursuant to Part IX, Regulation 73 of the Guyana Civil Aviation (Air Navigation) Regulations and Guyana Aviation Requirements Part: 12, for the time being in force and subject to the conditions specified in the Operations Specifications, attached.</i></li> <li>2. <i>The Director General Guyana Civil Aviation Authority in exercise of his powers under the regulations, hereby grant the Licence to the aerodrome (heliport/helideck) named above, for the period specified below. The Licence may be renewed for such period approved by the Director General Guyana Civil Aviation Authority once he is satisfied that the heliport/helideck continue to meet at least the minimum requirements of the regulations and the standards contained in the GCAA Heliport Standards and Recommendations Manual: GCAA/SRPLH/2019-001.</i></li></ol> <p>Date of Initial Issue: _____</p> <p>Date Renewed: _____</p> <p>Date of Expiration: _____</p>  <p style="text-align: right;">Name: _____ (Director General Civil Aviation Authority)</p>  <p style="text-align: right;">Signature: _____ (Director General Civil Aviation Authority)</p>		



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GCAA/SRPLH/2019-001



File Ref. No:

GCAA/AGA/

GCAA Form No: GCAA/AGA/ 003-H

Licence No:

/2019

GUYANA  
CIVIL AVIATION AUTHORITY

OPERATIONS SPECIFICATIONS  
HELIPORT/HELIDECK

1. The Aerodrome (heliport/helideck) Licence is issued by the Director General Guyana Civil Aviation Authority pursuant to the authority bestowed upon him under the civil aviation regulations of Guyana.
2. The heliport/helideck to which the Licence is issued **shall** be used for the purposes specified in the company's approved Operations Manual and for such period as specified on the Licence. The Licence may be renewed upon expiration once the Director General Guyana Civil Aviation Authority is satisfied that the heliport/helideck continues to meet the minimum requirements of the Regulations, the GCAA Heliport Standards and Recommendations Manual "GCAA/SRPLH/2019-001" and the procedures set out in the company's approved Operations Manual.
3. The heliport/helideck **shall** be used for the purpose(s) intended and approved in the company's approved Operations Manual, such as, a place of take-off and landing of helicopters engaged in flight for the purposes of public transport of passengers and cargo, and also for the purposes of instruction in flying, subject to the following conditions:
  - a) Not for use by Helicopter exceeding "D-Value" 21 metres.
  - b) Not for use by Helicopter exceeding MTOW 14.6 tonnes.
4. Helicopter operations exceeding approved helideck "D-Value" may be conducted in accordance with the procedures in the company's approved Operations Manual.
5. The heliport/helideck may be used for Day/Night Operations.
6. The heliport/helideck shall be maintained in accordance with the procedures contained in the company's approved Operations Manual.
7. Windssocks and boundary markers shall be positioned appropriately at the heliport/helideck at all times during take-off and landing of aircraft.
8. The Licensee shall notify the Director General Guyana Civil Aviation Authority in writing of any changes in the physical characteristics of the heliport/helideck, including alterations to visual aids, etc. Changes shall not be made without the prior approval of the Director General Guyana Civil Aviation Authority. Failure to inform the Director General Guyana Civil Aviation Authority of the changes may result in amendment, variation, suspension or revocation of the Licence, in accordance with Regulation 77 of the Guyana Civil Aviation (Air Navigation) Regulations.
9. It is the responsibility of the Licensee/Operator to ensure the safety and security of the heliport/helideck and its users. This is paramount and precautions laid down in the regulations, GCAA Heliport Standards and Recommendations Manual "GCAA/SRPLH/2019-001" and the company Operations Manual must be observed at all times.

Name: \_\_\_\_\_  
(Director General Civil Aviation Authority)

Signature: \_\_\_\_\_  
(Director General Civil Aviation Authority)