AVIATION SPECIFICATIONS 6

HELIPORTS

EFFECTIVE DATE : 1 MARCH 2023
REVISION NO: 0

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1 Introduction and applicability

1.1 Aviation Specifications 6 – Heliports (“AS-6”) is issued by the Director-General of Civil Aviation pursuant to the Air Navigation (139 – Aerodromes) Regulations 2023 (“ANR-139”), and specify the design, operations and maintenance requirements of a heliport certified under the ANR-139.

1.2 AS-6 applies to a certified operator to whom a heliport certificate is granted or renewed under regulation 6 of the ANR-139, or transferred in accordance with regulation 9, and that remains in force, and any reference to a certified operator is a reference to the holder of that heliport certificate.

2 Definitions

2.1 Any term in these Specifications that is defined in the First Schedule to the Air Navigation (139 - Aerodromes) Regulations 2023 has the meaning given to that term in that Schedule unless the term is otherwise defined in Appendix 1 to this AS-6.

3 Common Reference Systems

3.1 A certified operator must use the following reference systems:

(a) Horizontal reference system

World Geodetic System – 1984 (WGS-84) must be used as the horizontal (geodetic) reference system. Reported aeronautical geographical coordinates (indicating latitude and longitude) must be expressed in terms of the WGS-84 geodetic reference datum.

(b) Vertical reference system

Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, must be used as the vertical reference system.

(c) Temporal reference system

The Gregorian calendar and Coordinated Universal Time (UTC) must be used as the temporal reference system.

4 Heliport Data

4.1 Aeronautical data

4.1.1 Determination and reporting of heliport-related aeronautical data to the aeronautical information service (“AIS”) provider must be in accordance with the accuracy and integrity classification required to meet the needs of the end-users of aeronautical data.

4.1.2 Digital data error detection techniques, as specified in PANS-AIM (Doc 10066), based on systemic cycling codes, must be used during the transmission and/or storage of aeronautical data and digital data sets.

4.2 Heliport reference point

4.2.1 A heliport reference point must be established for a heliport that is not collocated with an aerodrome. When the heliport is collocated with an aerodrome, the established aerodrome reference point (ARP) serves both aerodrome and heliport.

4.2.2 The heliport reference point must be located near the initial or planned geometric centre of the heliport and must normally remain where first established.

4.2.3 The position of the heliport reference point must be measured and reported to the AIS provider in degrees, minutes and seconds.

4.3 Heliport elevations

4.3.1 The heliport elevation and geoid undulation at the heliport elevation position must be measured and reported to the AIS provider to the accuracy of one-half metre.

4.3.2 The elevation of the touchdown and lift-off area (TLOF) and/or the elevation and geoid undulation of each threshold of the final approach and take-off area (FATO) (where appropriate) must be measured and reported to the AIS provider to the accuracy of one-half metre. Geoid undulation must be measured in accordance with the appropriate system of coordinates.

4.4 Heliport dimensions and related information

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

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

(b) TLOF — dimensions to the nearest metre, slope, surface type, bearing strength in tonnes (1,000 kg);

(c) FATO — type of FATO, true bearing to one-hundredth of a degree, designation number (where appropriate), length and width to the nearest metre , slope, surface type;

(d) safety area — length, width and surface type;

(e) helicopter taxiway and helicopter taxi route — 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 taxiways, helicopter taxi routes and helicopter stands.

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

4.4.3 The geographical coordinates of appropriate centre line points of helicopter taxiways and helicopter taxi routes must be measured and reported to the AIS provider in degrees, minutes, seconds and hundredths of seconds.

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

4.4.5 The geographical coordinates of obstacles in Area 2 (the part within the heliport boundary) (*See Figures 4-1A and 4-1B*) and in Area 3 (*See Figure 4-2*) must be measured and reported to the AIS provider in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation, type, marking and lighting (if any) of obstacles must be reported to the AIS provider.

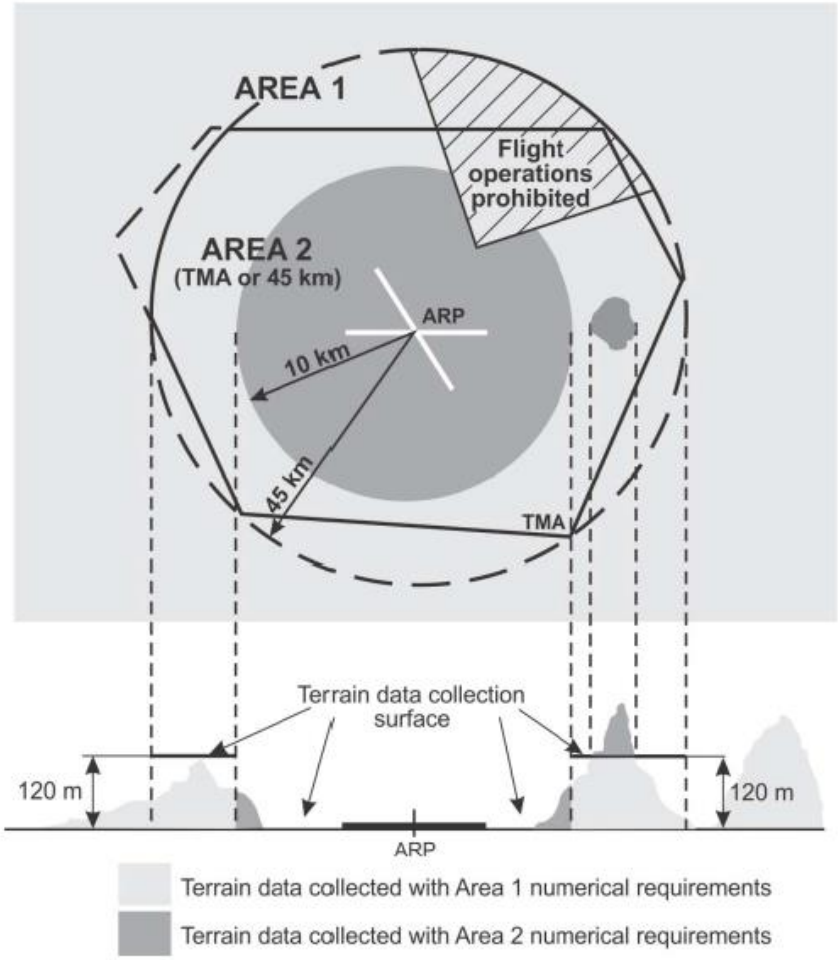


Figure 4-1A[1]. Terrain data collection surfaces — Area 1 and Area 2

[1] 1. Within the area covered by a 10-km radius from the heliport reference point (HRP) or the aerodrome reference point (ARP) (if the heliport is collocated within an aerodrome), terrain data must comply with the Area 2 numerical requirements.

2. In the area between 10 km and the terminal control area (TMA) boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plane 120 m above the lowest runway elevation must comply with the Area 2 numerical requirements.

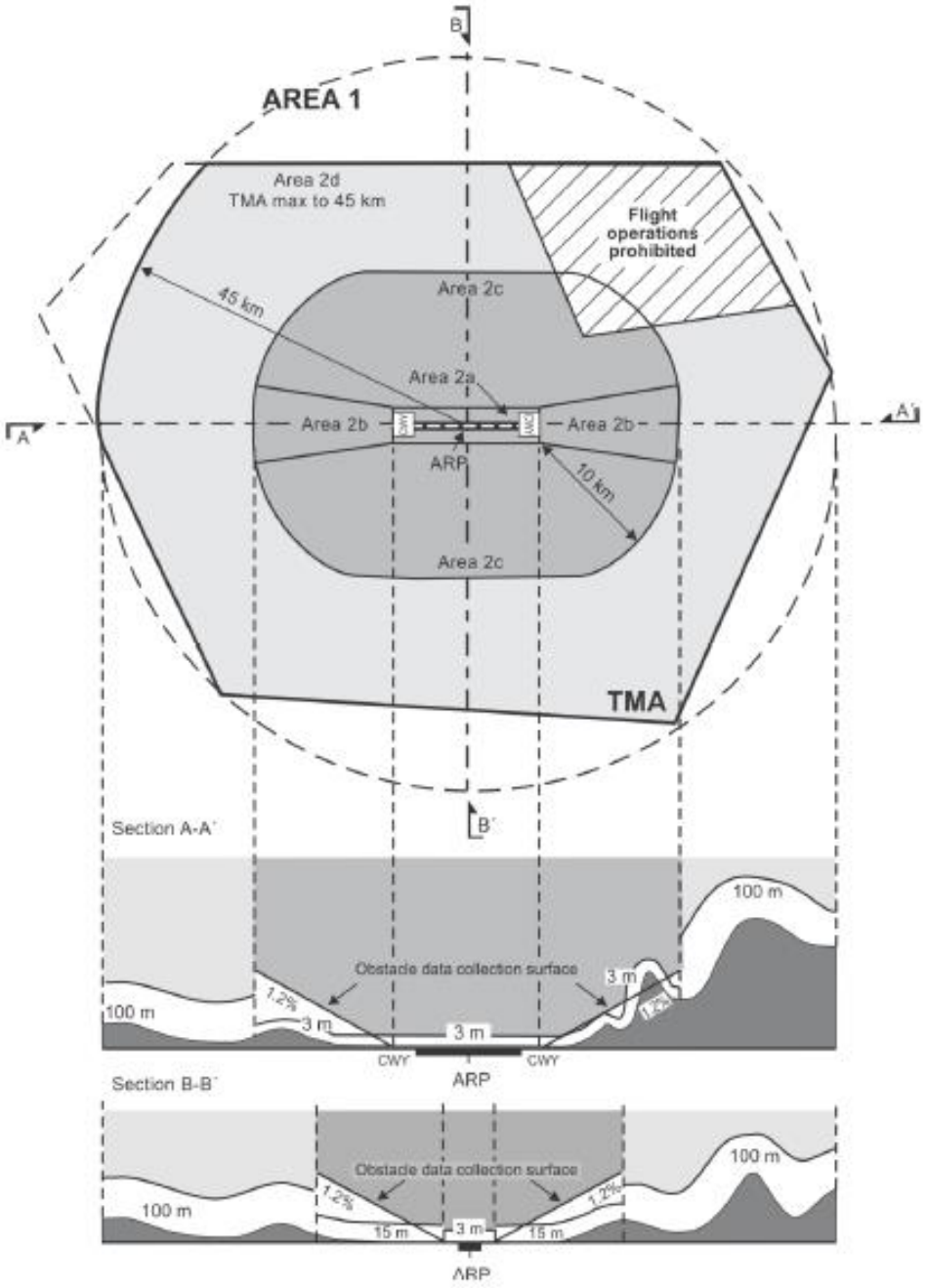


Figure 4-1B[2]. Obstacle data collection surfaces — Area 1 and Area 2

3. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that does not penetrate the horizontal plane 120 m above the lowest runway elevation must comply with the Area 1 numerical requirements.

4. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data must comply with the Area 1 numerical requirements.

[2] 1. Obstacle data must be collected and recorded in accordance with the Area 2 numerical requirements specified in Appendix 1 of PANS-AIM (ICAO Doc 10066).

2. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data must be collected and recorded in accordance with the Area 1 requirements.

3. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher must be collected and recorded in the database in accordance with the Area 1 numerical requirements specified in Appendix 1 of PANS-AIM (ICAO Doc 10066).

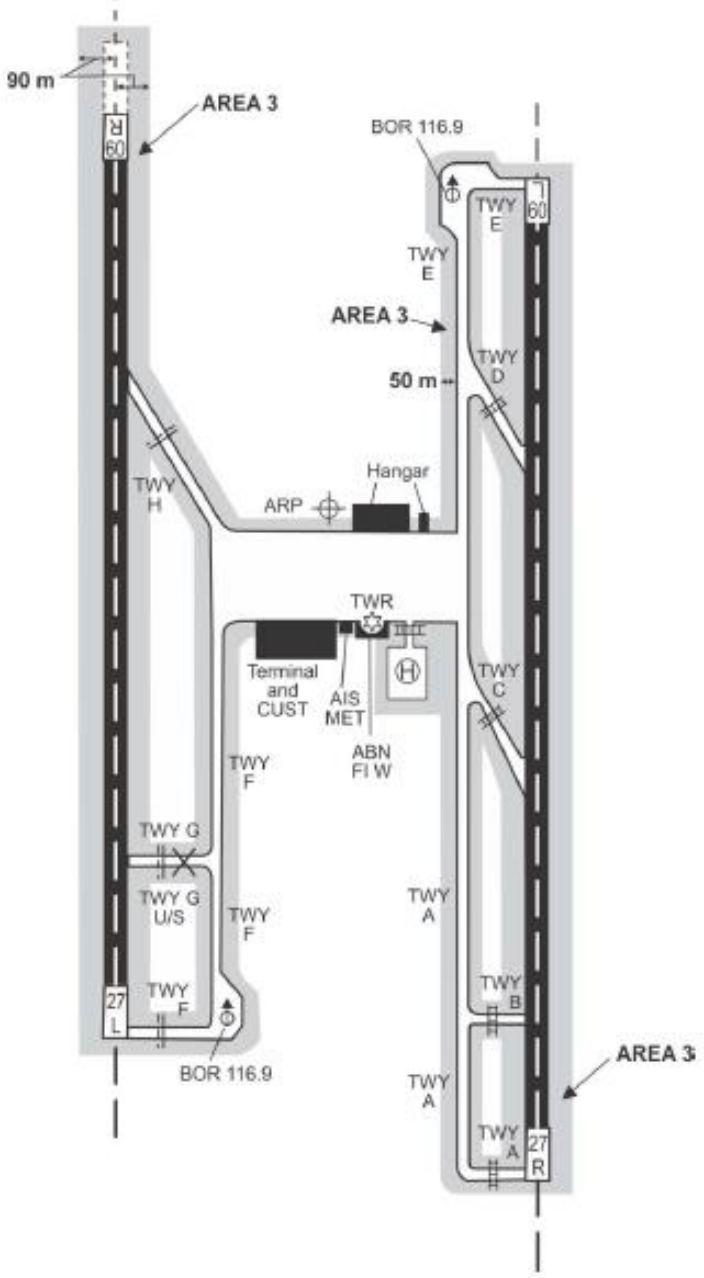


Figure 4-2[3]. Terrain and obstacle data collection surface — Area 3

4.5 Declared distances

4.5.1 The following distances to the nearest metre must be declared, where relevant, for a heliport:

(a) take-off distance available helicopters (TODAH);

(b) rejected take-off distance available helicopters (RTODAH); and

(c) landing distance available helicopters (LDAH).

[3] 1.Terrain and obstacle data in Area 3 must comply with the numerical requirements specified in Appendix 1 of PANS-AIM (ICAO Doc 10066).

4.6 Coordination between AIS provider and heliport operator

4.6.1 To ensure that the AIS provider obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements must be made for the heliport operator to report to the AIS provider, with a minimum of delay:

(a) information on heliport conditions;

(b) the operational status of associated facilities, services and navigation aids within their area of responsibility;

(c) any other information considered to be of operational significance.

4.6.2 The heliport operator must provide raw aeronautical information/data to the AIS provider taking into account accuracy and integrity requirements contained in Appendix 1 of the PANS-AIM (ICAO Doc 10066).

4.7 Rescue and firefighting

4.7.1 Information concerning the level of protection provided at a heliport for helicopter rescue and firefighting purposes must be made available to the AIS provider.

4.7.2 Changes in the level of protection normally available at a heliport for rescue and firefighting must be notified to the AIS provider and, where applicable, the air traffic service (“ATS”) provider to enable them to provide the necessary information to arriving and departing helicopters. When such a change has been corrected, the above units must be advised accordingly.

5 Physical Characteristics

5.1 Onshore heliports

Final approach and take-off area (FATO)

5.1.1 A FATO must:

(a) provide:

(i) an area free of obstacles, except for essential objects which because of their function are located on it, and of sufficient size and shape to ensure containment of every part of the design helicopter in the final phase of approach and commencement of take-off in accordance with the intended procedures;

(ii) when solid, a surface which is resistant to the effects of rotor downwash; and

(1) when collocated with a TLOF, is contiguous and flush with the TLOF; has bearing strength capable of withstanding the intended loads and ensures effective drainage; or

(2) when not collocated with a TLOF, is free of hazards should a forced landing be required;

and

(b) be associated with a safety area.

5.1.2 A heliport must be provided with at least one FATO, which need not be solid.

5.1.3 The minimum dimensions of a FATO must be:

(a) where intended to be used by helicopters operated in performance class 1:

(i) the length of the rejected take-off distance (RTOD) for the required take-off procedure prescribed in the helicopter flight manual (HFM) of the helicopters for which the FATO is intended, or 1.5 Design D, whichever is greater; and

(ii) the width for the required procedure prescribed in the HFM of the helicopters for which the FATO is intended, or 1.5 Design D, whichever is greater;

and

(b) where intended to be used by helicopters operated in performance class 2 or 3, the lesser of:

(i) an area within which can be drawn a circle of diameter of 1.5 Design D; or,

(ii) when there is a limitation on the direction of approach and touchdown, an area of sufficient width to meet the requirement of 5.1.1 (a) (i) but not less than 1.5 times the overall width of the design helicopter.

5.1.4 Essential objects located in a FATO must not penetrate a horizontal plane at the FATO elevation by more than 5 cm.

5.1.5 A FATO must be surrounded by a safety area which need not be solid.

Safety areas

5.1.6 A safety area must provide:

(a) an area free of obstacles, except for essential objects which because of their function are located on it, to compensate for manoeuvring errors; and

(b) when solid, a surface which is contiguous and flush with the FATO, is resistant to the effects of rotor downwash and ensures effective drainage.

5.1.7 The safety area surrounding a FATO must extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 Design D, whichever is greater (*See Figure 5-1).*

5.1.8 No mobile object must be permitted in a safety area during helicopter operations.

5.1.9 Essential objects located in the safety area must not penetrate a surface originating at the edge of the FATO at a height of 25 cm above the plane of the FATO sloping upwards and outwards at a gradient of 5 per cent.

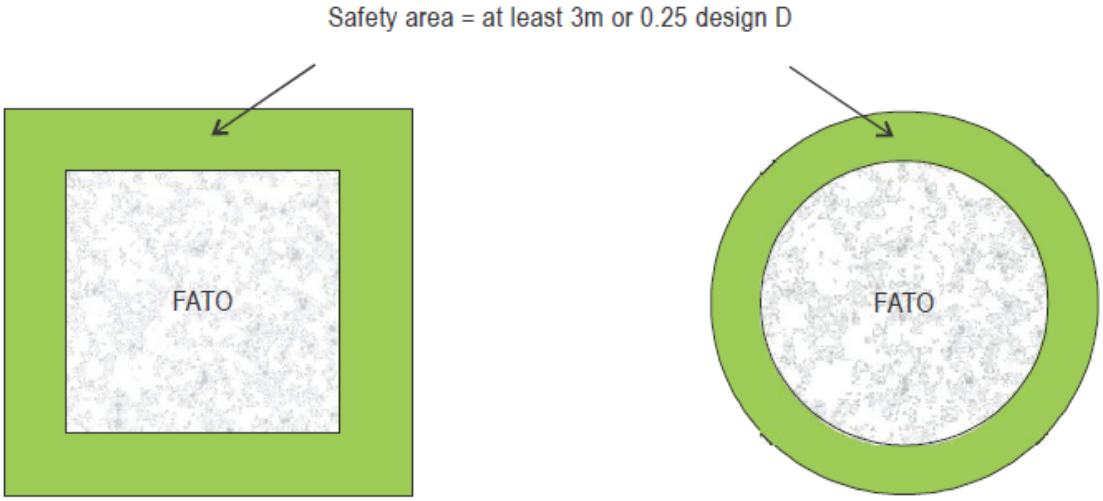


Figure 5-1. FATO and associated safety area

Protected slide slopes

5.1.10 A heliport must be provided with at least one protected side slope, rising at 45 degrees from the edge of the safety area and extending to a distance of 10 m (*See Figure 5-2*).

5.1.11 The surface of a protected side slope must not be penetrated by obstacles.

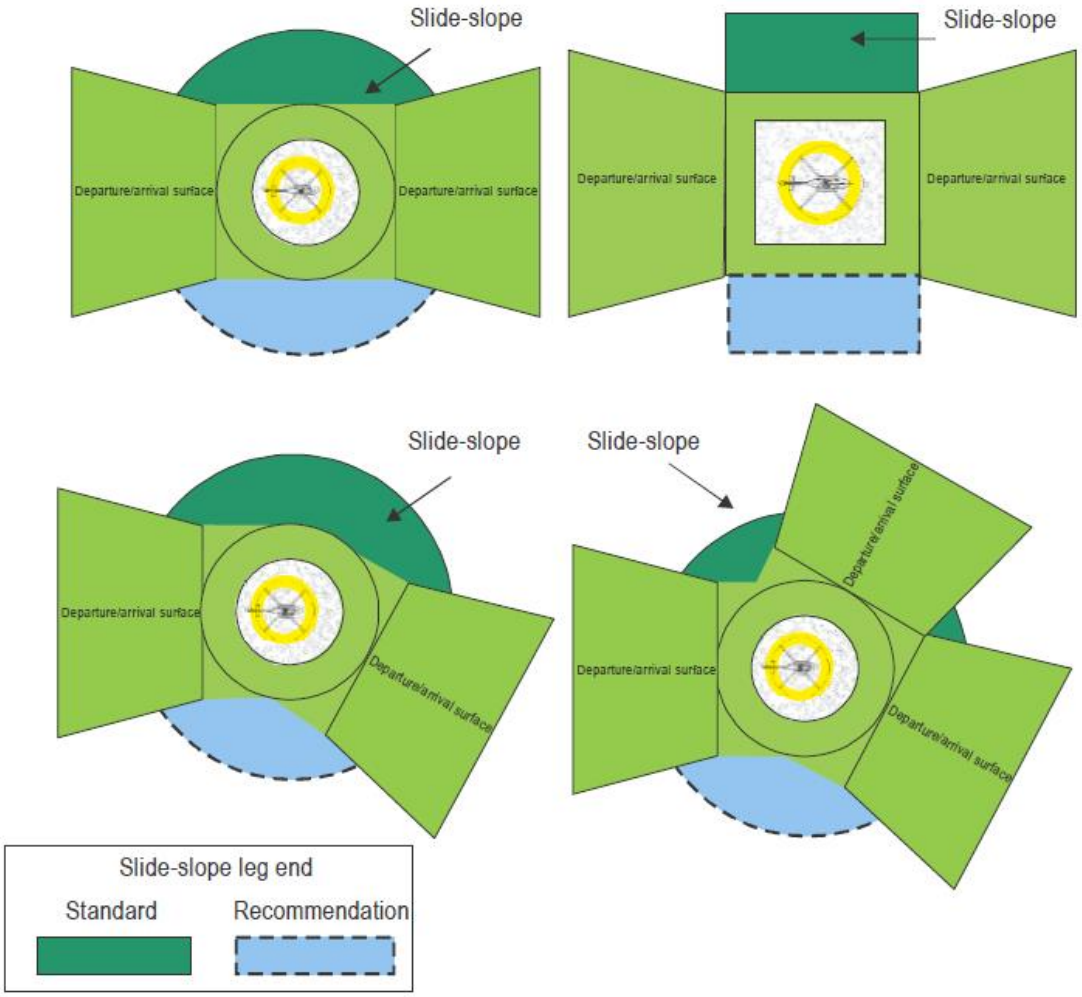


Figure 5-2. FATO simple/complex safety area and side slope protection

Helicopter clearways

5.1.12 A helicopter clearway must provide:

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

(b) when solid, a surface which is contiguous and flush with the FATO, is resistant to the effects of rotor downwash and is free of hazards should a forced landing be required.

5.1.13 When a helicopter clearway is provided, it must be located beyond the end of the FATO.

Touchdown and lift-off area (TLOF)

5.1.14 A TLOF must:

(a) provide:

(i) an area free of obstacles and of sufficient size and shape to ensure containment of the undercarriage of the most demanding helicopter the TLOF is intended to serve in accordance with the intended orientation;

(ii) a surface which:

(1) has sufficient bearing strength to accommodate the dynamic loads associated with the anticipated type of arrival of the helicopter at the designated TLOF;

(2) is free of irregularities that would adversely affect the touchdown or lift-off of helicopters;

(3) has sufficient friction to avoid skidding of helicopters or slipping of persons; and

(4) is resistant to the effects of rotor downwash;

(5) ensures effective drainage while having no adverse effect on the control or stability of a helicopter during touchdown and lift-off, or when stationary;

and

(b) be associated with a FATO or a stand.

5.1.15 A heliport must be provided with at least one TLOF.

5.1.16 A TLOF must be provided whenever it is intended that the undercarriage of the helicopter will touch down within a FATO or stand, or lift off from a FATO or stand.

5.1.17 The minimum dimensions of a TLOF must be:

(a) when in a FATO intended to be used by helicopters operated in performance class 1, the dimensions for the required procedure prescribed in the HFMs of the helicopters for which the TLOF is intended; and

(b) when in a FATO intended to be used by helicopters operated in performance class 2 or 3, or in a stand:

(i) when there is no limitation on the direction of touchdown, of sufficient size to contain a circle of diameter of at least 0.83 D of:

(1) in a FATO, the design helicopter; or

(2) in a stand, the largest helicopter the stand is intended to serve; and

(ii) when there is a limitation on the direction of touchdown, of sufficient width to meet the requirement of 5.1.14 (a) (i) but not less than twice the undercarriage width (UCW) of:

(1) in a FATO, the design helicopter; or,

(2) in a stand, the most demanding (mass as well as size) helicopter the stand is intended to serve.

5.1.18 For an elevated heliport, the minimum dimensions of a TLOF, when in a FATO, must be of sufficient size to contain a circle of diameter of at least 1 Design-D.

5.1.19 When a TLOF is within a helicopter stand, it must be centred on the stand.

5.1.20 A TLOF must be provided with markings which clearly indicate the touchdown position and, by their form, any limitations on manoeuvring.

5.1.21 Safety devices such as safety nets or safety shelves must be located around the edge of an elevated heliport but must not exceed the height of the TLOF.

Helicopter taxiways

5.1.22 A helicopter taxiway must:

(a) provide:

(i) an area free of obstacles and of sufficient width to ensure containment of the undercarriage of the most demanding wheeled helicopter the taxiway is intended to serve;

(ii) a surface which:

(1) has bearing strength to accommodate the taxiing loads of the helicopters the taxiway is intended to serve;

(2) is free of irregularities that would adversely affect the ground taxiing of helicopters;

(3) is resistant to the effects of rotor downwash;

(4) ensures effective drainage while having no adverse effect on the control or stability of a wheeled helicopter when being manoeuvred under its own power, or when stationary;

and

(b) be associated with a taxi-route.

5.1.23 The minimum width of a helicopter taxiway must be the lesser of:

(a) Twice the UCW of the most demanding helicopter the taxiway is intended to serve; or

(b) a width meeting the requirements of 5.1.22 (a) (i).

Helicopter taxi-routes

5.1.24 A helicopter taxi-route must provide:

(a) an area free of obstacles, except for essential objects which because of their function are located on it, established for the movement of helicopters; of sufficient width to ensure containment of the largest helicopter the taxi-route is intended to serve; and

(b) when solid, a surface which is resistant to the effects of rotor downwash; and

(i) when collocated with a taxiway:

(1) is contiguous and flush with the taxiway;

(2) does not present a hazard to operations; and

(3) ensures effective drainage; and

(ii) when not collocated with a taxiway, is free of hazards should a forced landing be required.

5.1.25 No mobile object must be permitted on a taxi-route during helicopter operations.

Helicopter ground taxi-routes

5.1.26 A helicopter ground taxi-route must have a minimum width of 1.5 times the overall width of the largest helicopter it is intended to serve, and be centred on a taxiway. (*See Figure 5-3*)

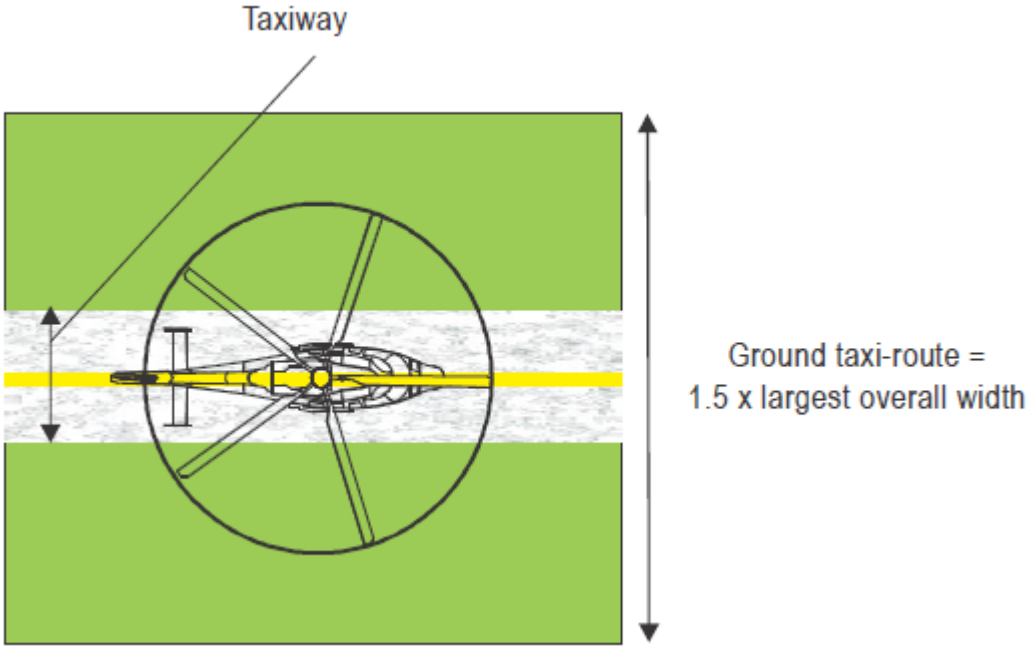


Figure 5-3. Helicopter taxiway/ ground taxi-route

5.1.27 Essential objects located in a helicopter ground taxi-route must not:

(a) be located at a distance of less than 50 cm outwards from the edge of the helicopter ground taxiway; and

(b) penetrate a surface originating 50 cm outwards of the edge of the helicopter taxiway and a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

Helicopter air taxi-routes

5.1.28 A helicopter air taxi-route must have a minimum width of twice the overall width of the largest helicopter it is intended to serve.

5.1.29 If collocated with a taxiway for the purpose of permitting both ground and air taxi operations (*see Figure 5-4*):

(a) the helicopter air taxi-route must be centred on the taxiway; and

(b) essential objects located in the helicopter air taxi-route must not:

(i) be located at a distance of less than 50 cm outwards from the edge of the helicopter taxiway; and

(ii) penetrate a surface originating 50 cm outwards of the edge of the helicopter taxiway and a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

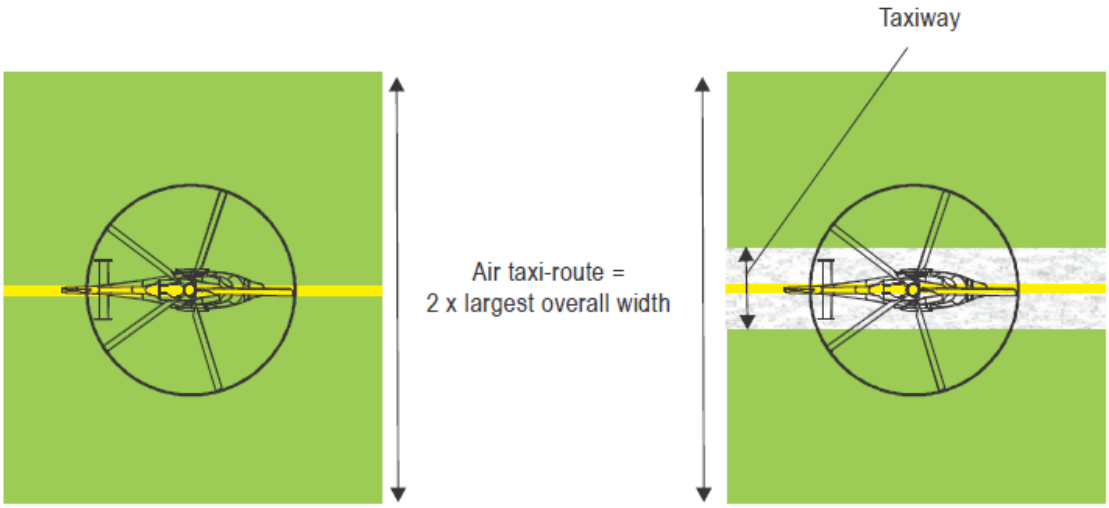


Figure 5-4. Helicopter air taxi-route and combined air taxi-route/taxiway

Helicopter stands

5.1.30 A helicopter stand must:

(a) provide:

(i) an area free of obstacles and of sufficient size and shape to ensure containment of every part of the largest helicopter the stand is intended to serve when it is being positioned within the stand;

(ii) a surface which:

(1) is resistant to the effects of rotor downwash;

(2) is free of irregularities that would adversely affect the manoeuvring of helicopters;

(3) has bearing strength capable of withstanding the intended loads;

(4) has sufficient friction to avoid skidding of helicopters or slipping of persons; and

(5) ensures effective drainage while having no adverse effect on the control or stability of a wheeled helicopter when being manoeuvred under its own power, or when stationary;

and

(b) be associated with a protection area.

5.1.31 The minimum dimensions of a helicopter stand must be:

(a) a circle of diameter of 1.2 D of the largest helicopter the stand is intended to serve; or

(b) when there is a limitation on manoeuvring and positioning, of sufficient width to meet the requirement of 5.1.30 (a) (i) but not less 1.2 times overall width of largest helicopter the stand is intended to serve.

5.1.32 Each helicopter stand must be provided with positioning markings to clearly indicate where the helicopter is to be positioned and, by their form, any limitations on manoeuvring.

5.1.33 A stand must be surrounded by a protection area which need not be solid.

Protection areas

5.1.34 A protection area must provide:

(a) an area free of obstacles, except for essential objects which because of their function are located on it; and

(b) when solid, a surface which is contiguous and flush with the stand, is resistant to the effects of rotor downwash and ensures effective drainage.

5.1.35 When associated with a stand designed for turning, the protection area must extend outwards from the periphery of the stand for a distance of 0.4D (*See Figure 5-5*).

5.1.36 When associated with a stand designed for taxi-through, the minimum width of the stand and protection area must not be less than the width of the associated taxi-route (*see Figures 5-6 and 5-7*).

5.1.37 When associated with a stand designed for non-simultaneous use (*see Figures 5-8 and 5-9*):

(a) the protection area of adjacent stands may overlap but must not be less than the required protection area for the larger of the adjacent stands; and

(b) the adjacent non-active stand may contain a static object but it must be wholly within the boundary of the stand.

5.1.38 No mobile object must be permitted in a protection area during helicopter operations.

5.1.39 Essential objects located in the protection area must not:

(a) if located at a distance of less than 0.75 D from the centre of the helicopter stand, penetrate a surface at a height of 5 cm above the surface of the central zone; and

(b) if located at a distance of 0.75 D or more from the centre of the helicopter stand, penetrate a surface at a height of 25 cm above the plane of the central zone and sloping upwards and outwards at a gradient of 5 per cent.

Location of a FATO in relation to a runway or taxiway

5.1.40 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 must not be less than the appropriate dimension in Table 5-1.

Table 5-1 FATO minimum separation distance for simultaneous operations

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	60m
3 175 kg up to but not including 5 760 kg	120m
5 760 kg up to but not including 100 000 kg	180m
100 000 kg and over	250m

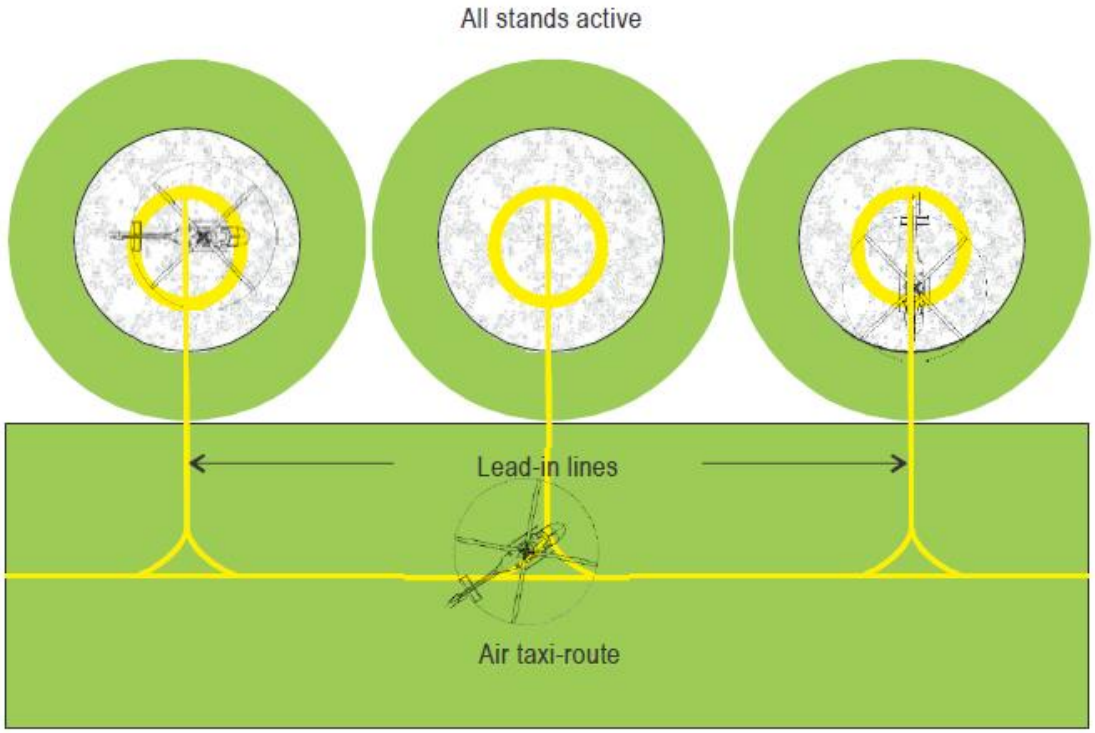


Figure 5-5. Turning stands (with air taxi-routes) — simultaneous use

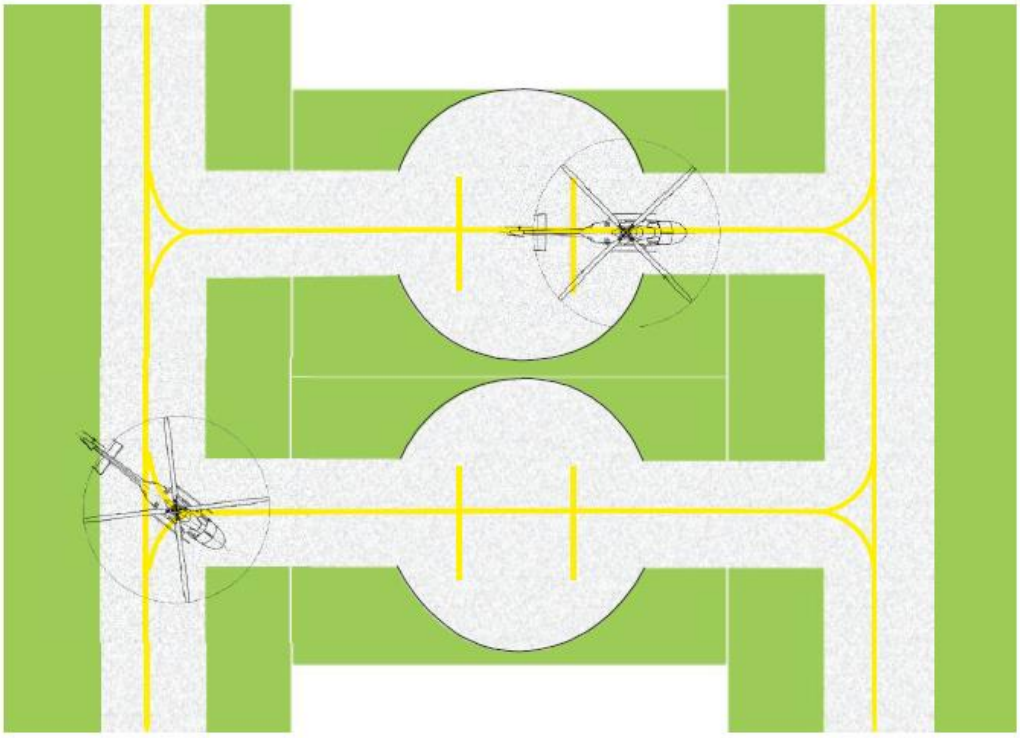


Figure 5-6. Ground taxi-through stands (with taxiway/ground taxi-route) simultaneous use

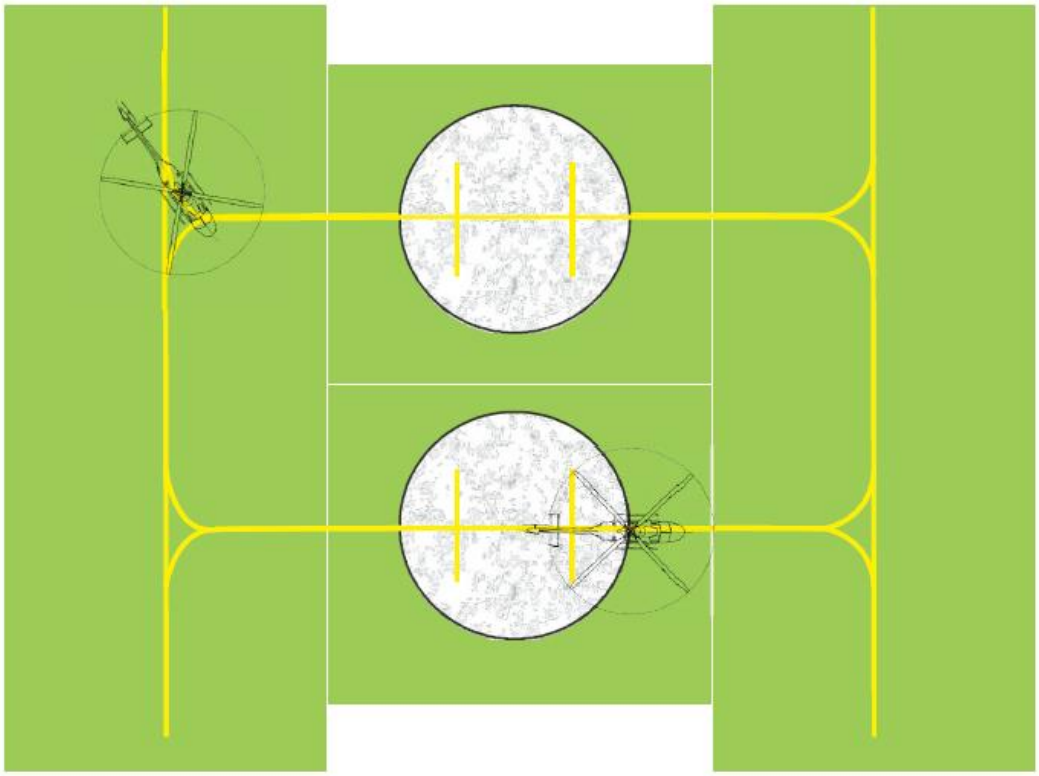


Figure 5-7. Air taxi-through stands (with air taxi-route) simultaneous use

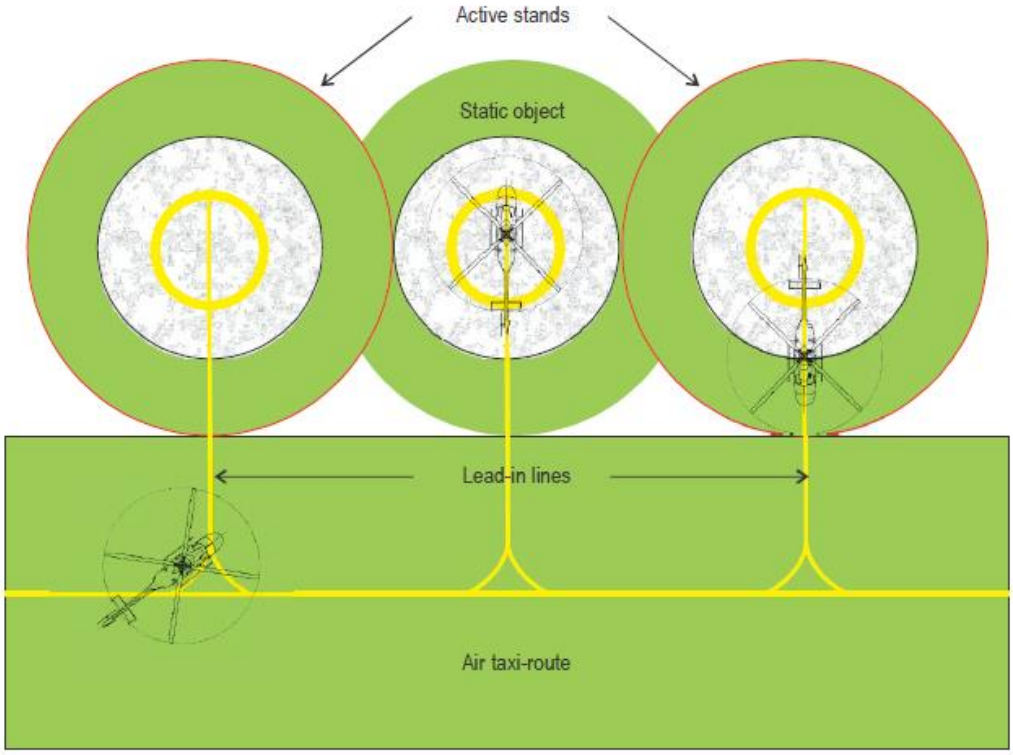


Figure 5-8. Turning stands (with air taxi-routes) non-simultaneous use — outer stands active

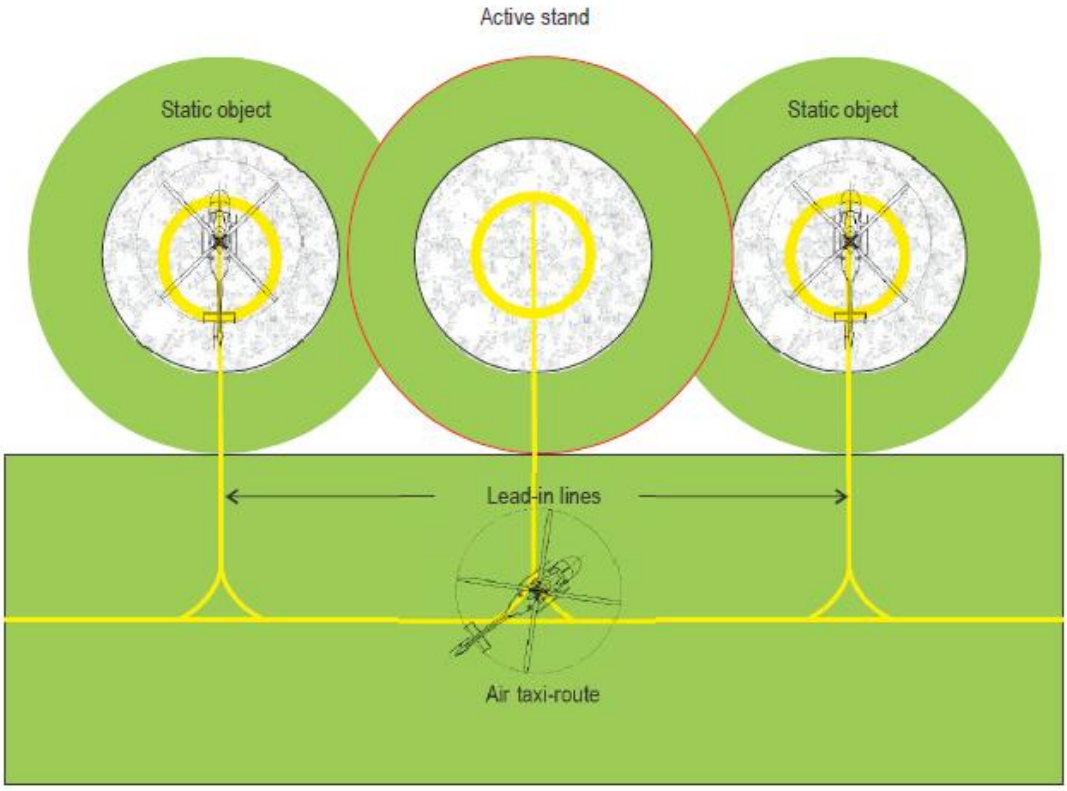


Figure 5-9. Turning stands (with air taxi-route) non-simultaneous use — inner stand active

5.2 Helidecks

FATOs and TLOFs

5.2.1 A helideck must be provided with one FATO and one coincident or collocated TLOF.

5.2.2 A FATO may be any shape but must 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.

5.2.3 A TLOF may be any shape but must 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.

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

5.2.5 The TLOF must be dynamic load-bearing.

5.2.6 The TLOF must provide ground effect.

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

5.2.8 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 must not exceed a height of 25 cm.

5.2.9 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, must not exceed a height of 5 cm.

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

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

5.2.12 The surface of the TLOF must be skid-resistant to both helicopters and persons and be sloped to prevent pooling of water.

5.3 Shipboard heliports

5.3.1 When helicopter operating areas are provided in the bow or stern of a ship or are purpose-built above the ship’s structure, they must be regarded as purpose-built shipboard heliports.

FATOs and TLOFs

5.3.2 A shipboard heliport must be provided with one FATO and one coincidental or collocated TLOF.

5.3.3 A FATO may be any shape but must 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.

5.3.4 The TLOF of a shipboard heliport must be dynamic load-bearing.

5.3.5 The TLOF of a shipboard heliport must provide ground effect.

5.3.6 For purpose-built shipboard heliports provided in a location other than the bow or stern, the TLOF must 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.

5.3.7 For purpose-built shipboard heliports provided in the bow or stern of a ship, the TLOF must be of sufficient size to:

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

(b) for operations with limited touchdown directions, contain an area within which can be accommodated two opposing arcs of a circle with a diameter of not less than 1 D in the helicopter's longitudinal direction. The minimum width of the heliport must be not less than 0.83 D. (See Figure 5-10.)

5.3.8 For non-purpose-built shipboard heliports, the TLOF must 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.

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

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

5.3.11 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 must not exceed a height of 25 cm.

5.3.12 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, must not exceed a height of 5 cm.

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

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

5.3.15 The surface of the TLOF must be skid-resistant to both helicopters and persons.

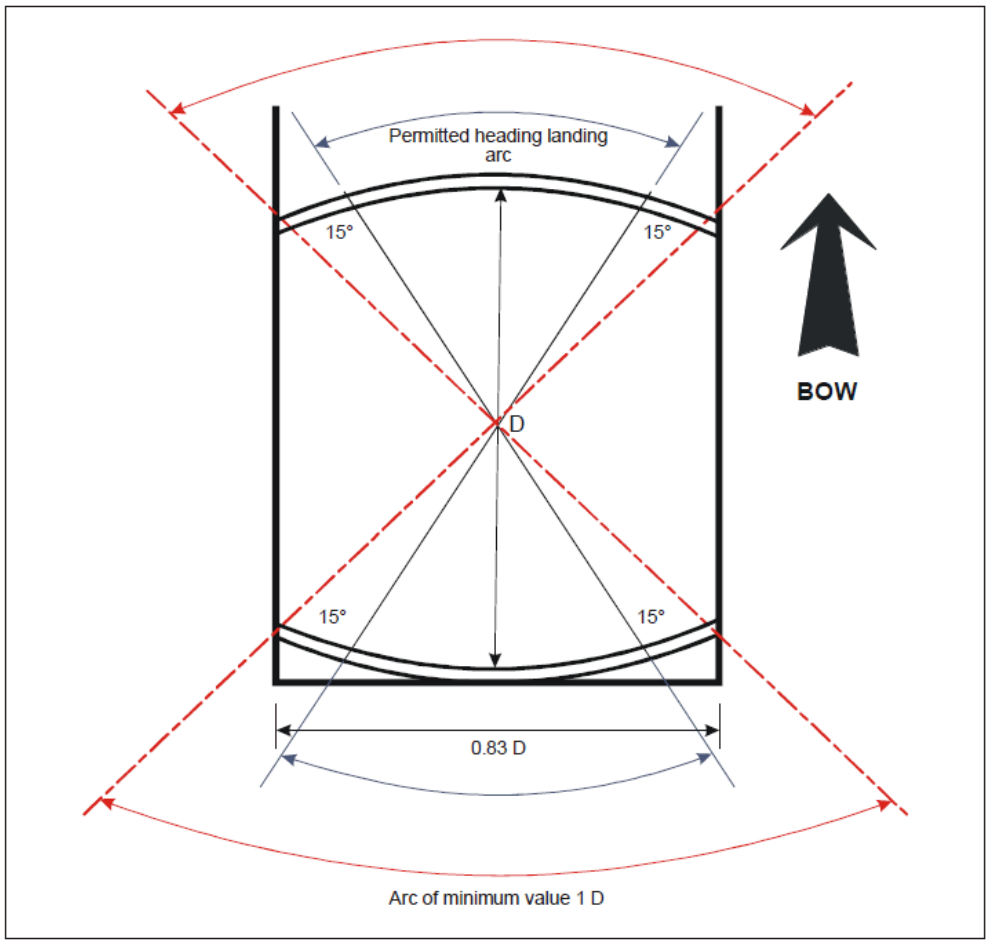


Figure 5-10. Shipboard permitted landing headings for limited heading operations

6 Obstacle Environment

6.1 Obstacle limitation surfaces and sectors

Approach surface

6.1.1 Characteristics. The limits of an approach surface must 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.

6.1.2 The elevation of the inner edge must 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.

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

6.1.4 In the case of an approach surface involving a turn, the surface must be a complex surface containing the horizontal normals to its centre line and the slope of the centre line must be the same as that for a straight approach surface. See Figure 6-5.

6.1.5 In the case of an approach surface involving a turn, the surface must not contain more than one curved portion.

6.1.6 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 must not be less than 575 m.

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

Transitional surface[4]

6.1.8 Characteristics. The limits of a transitional surface must 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 6-1.

[4] For a FATO at a heliport without a PinS approach incorporating a visual segment surface (VSS) there is no requirement to provide transitional surfaces.

6.1.9 The elevation of a point on the lower edge must be:

(a) along the side of the approach/ take-off climb surface[5] — equal to the elevation of the approach/ take-off climb surface at that point; and

(b) along the safety area — equal to the inner edge of the approach/ take-off climb surface[6].

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

Take-off climb surface

6.1.11 Characteristics. The limits of a take-off climb surface must 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.

6.1.12 The elevation of the inner edge must 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.

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

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

6.1.15 In the case of a take-off climb surface involving a turn, the surface must be a complex surface containing the horizontal normals to its centre line, and the slope of the centre line must be the same as that for a straight take-off climb surface. See Figure 6-5.

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

6.1.17 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 must not be less than 575 m.

[5] 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.
[6] 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.

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

Obstacle-free sector/surface — helidecks

6.1.19 Characteristics. An obstacle-free sector/surface must subtend an arc of specified angle.

6.1.20 A helideck obstacle-free sector must comprise two components, one above and one below helideck level (See Figure 6-7):

6.1.21 Above helideck level. The surface must 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.

6.1.22 Below helideck level. Within the (minimum) 210-degree arc, the surface must 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.

Limited obstacle sector/ surface — helidecks

6.1.23 Characteristics. A limited obstacle sector must not subtend an arc greater than 150 degrees. Its dimensions and location must be as indicated in Figure 6-8 for a 1 D FATO with coincidental TLOF and Figure 6-9 for a 0.83 D TLOF.

6.2 Obstacle limitation requirements

Surface-level heliports

6.2.1 The following obstacle limitation surfaces must be established for a FATO at heliports with a PinS approach procedure utilising a visual segment surface:

(a) take-off climb surface;

(b) approach surface; and

(c) transitional surfaces.

6.2.2 The following obstacle limitation surfaces must be established for a FATO at heliports, other than specified in 6.2.1, including heliports with a PinS approach procedure where a visual segment surface is not provided:

(a) take-off climb surface; and

(b) approach surface.

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

6.2.4 For heliports that have an approach/take-off climb surface with a 4.5 per cent slope design, objects must be permitted to penetrate the obstacle limitation surface if after an aeronautical study, it is determined that the mitigation measures can adequately manage the associated risks.

6.2.5 New objects or extensions of existing objects must not be permitted above any of the surfaces in 6.2.1 and 6.2.2 except when shielded by an existing immovable object or after an aeronautical study, it is determined that the object will not adversely affect the safety or significantly affect the regularity of operations of helicopters.

6.2.6 A surface-level heliport must have at least one approach and take-off climb surface. An aeronautical study must be undertaken when only a single approach and take-off climb surface is provided considering as a minimum, the following factors:

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

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

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

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

Table 6-1[7]. Dimensions and slopes of obstacle limitation surfaces for all visual FATOs

Surface and dimensions	*Slope design categories*		
	A	*B*	*C*
Approach and take-off climb surface:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Clearway boundary if provided)	Safety area boundary	Safety area boundary
Divergence: (1st and 2nd section)			
Day use only	10%	10%	10%
Night use	15%	15%	15%
First section:			
Length	3 386 m	245 m	1 220 m
Slope	4.5% (1:22.2)	8% (1:12.5)	12.5% (1:8)
Outer width	(b)	N/A	(b)
Second section:			
Length	N/A	830 m	N/A
Slope	N/A	16% (1:6.25)	N/A
Outer width	N/A	(b)	N/A
Total length from inner edge (a)	3 386 m	1 075 m	1 220 m
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

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

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

[7] Note. — The slope design categories in Table 6-1 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 6-1 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.

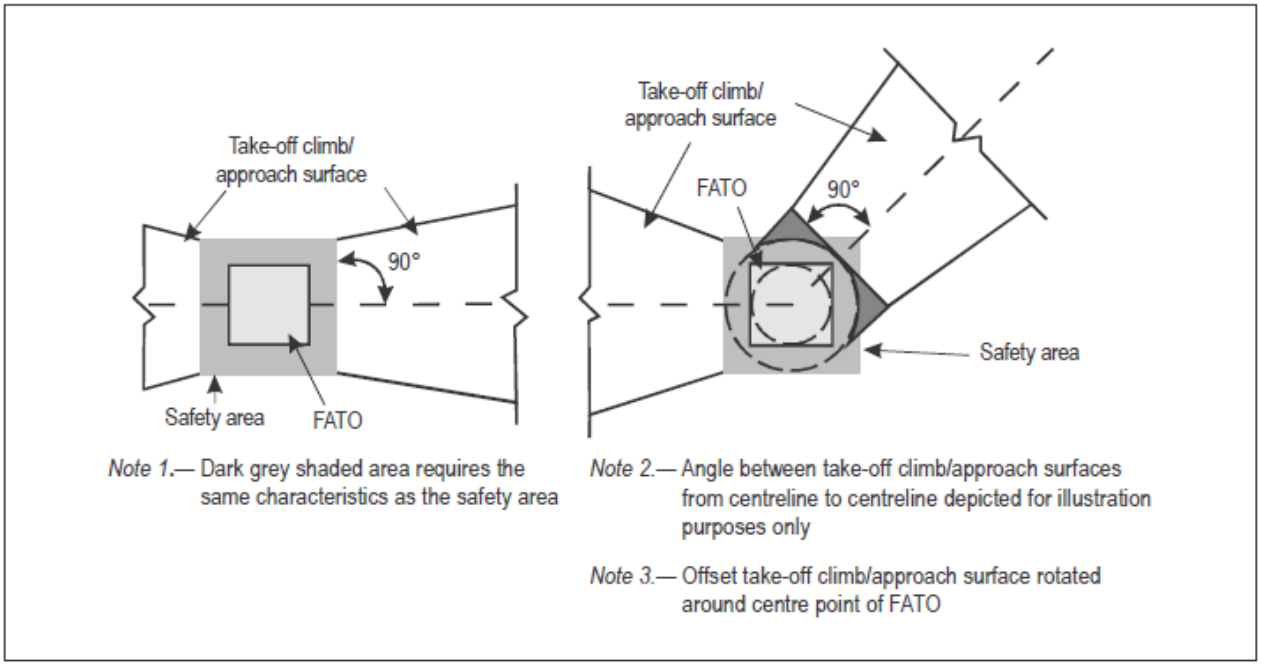


Figure 6-1 Obstacles limitation surfaces – take-off climb and approach surface

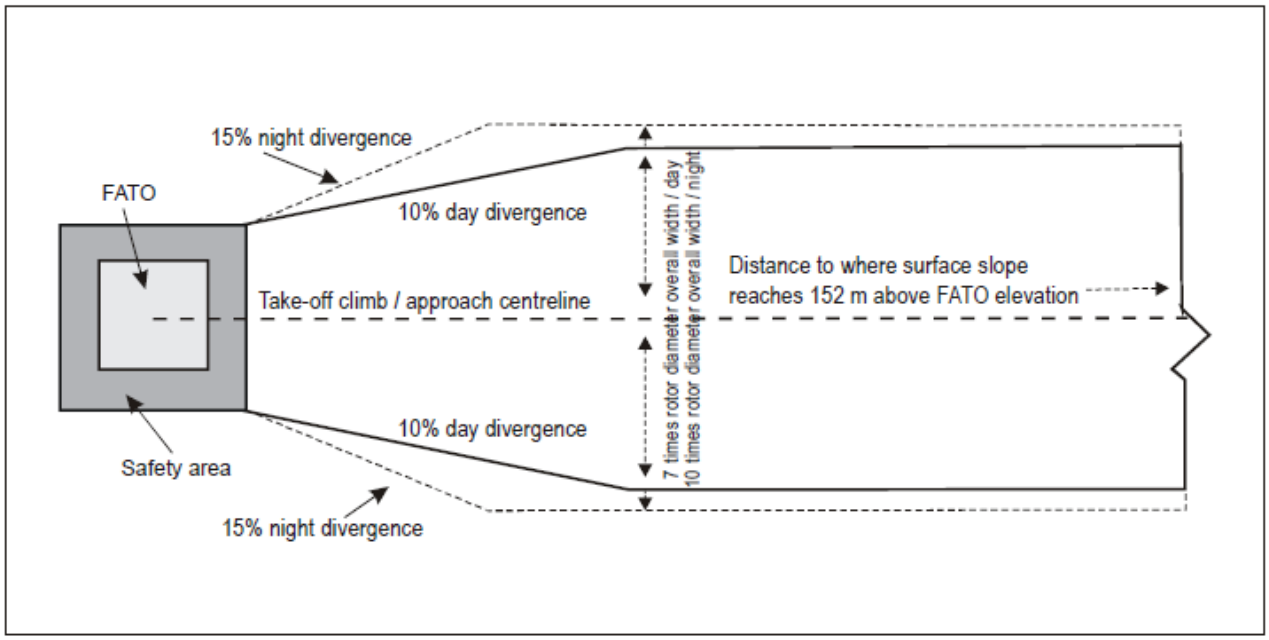


Figure 6-2 Take-off climb/ approach surface width

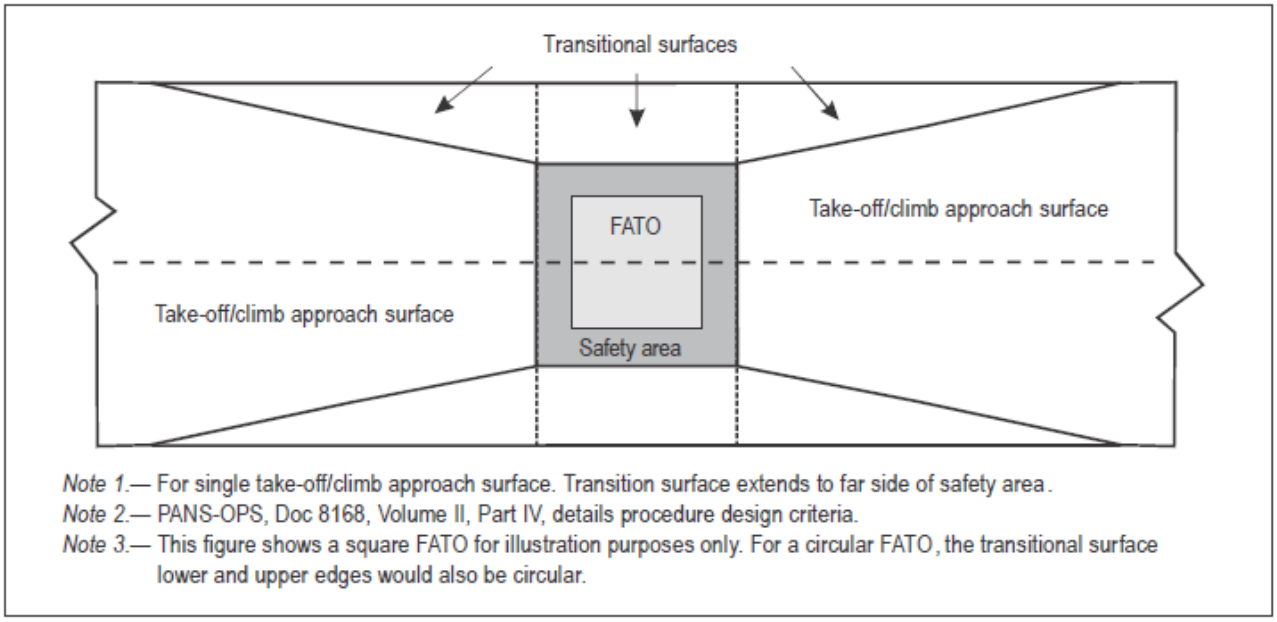


Figure 6-3 Transitional surface for a FATO with a PinS approach procedure with a VSS

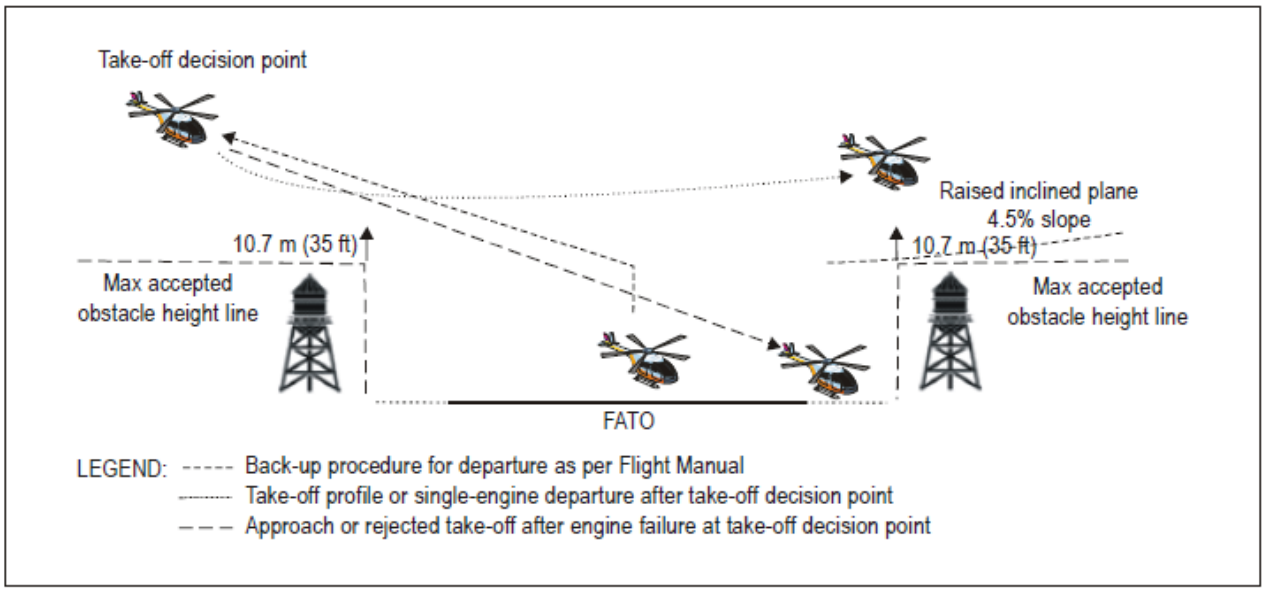


Figure 6-4[8] Example of raised inclined plane during operations in performance class 1

[8] Note 1. — This example diagram does not represent any specific profile, technique or helicopter type and is intended to show a generic example. An approach profile and a back-up procedure for departure profile are depicted. Specific manufacturers' operations in performance class 1 may be represented differently in the specific helicopter flight manual (HMF). Annex 6, Part 3, Attachment A provides back-up procedures that may be useful for operations in performance class 1.
Note 2. — The approach/landing profile may not be the reverse of the take-off profile.
Note 3. — Additional obstacle assessment might be required in the area that a back-up procedure is intended. Helicopter performance and the HFM limitations will determine the extent of the assessment required.

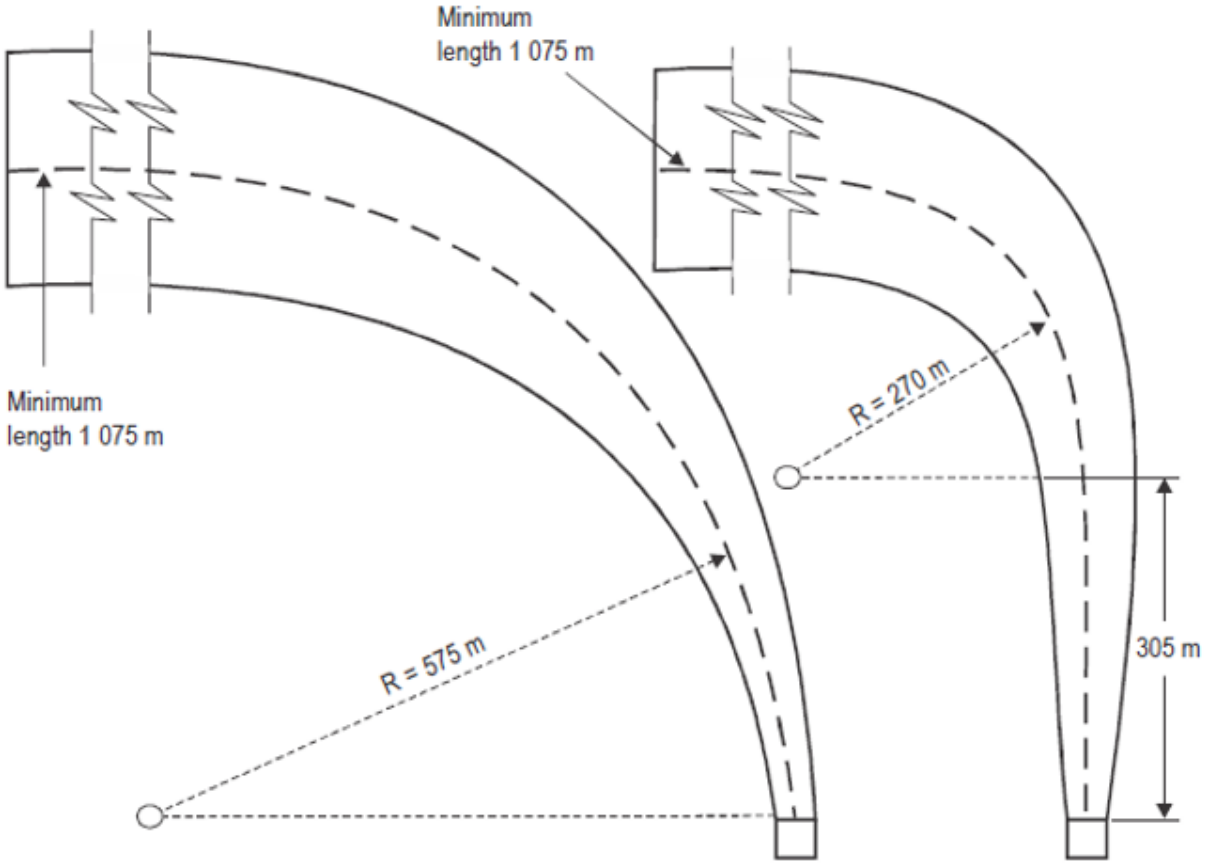
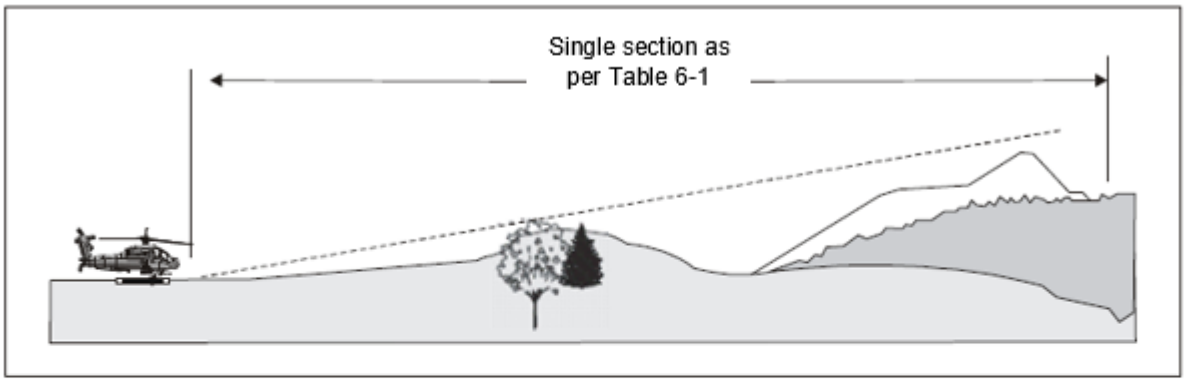
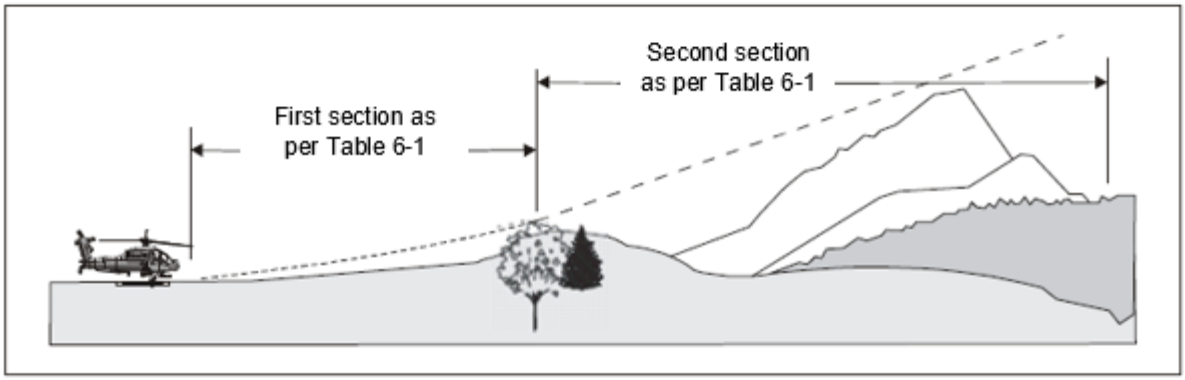


Figure 6-5[9] Curved approach and take-off climb surface for all FATOs

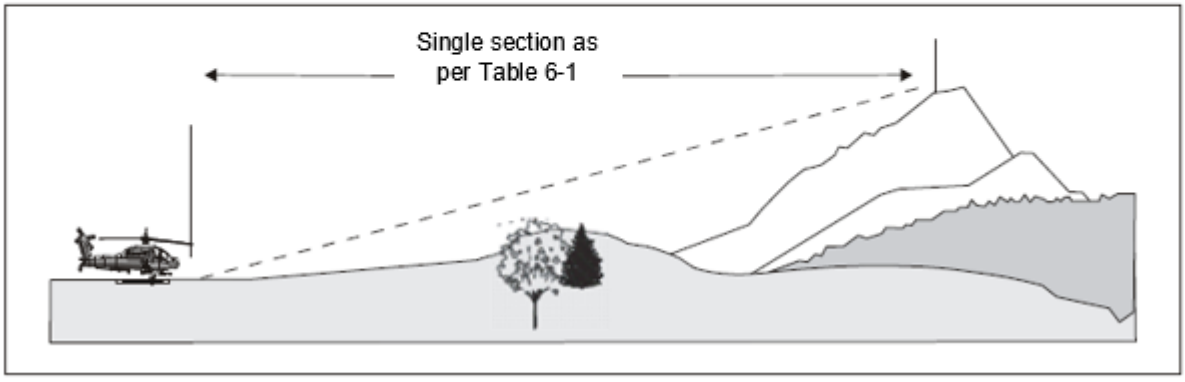
[9] Note 1 – Any combination of curve and straight portion may be established using the following formula: S + R ≥ 575m and R ≥ 270m where S = 305m, where S is the length of the straight portion and R is the radius of turn. Note any combination ≥ 575m will work.
Note 2 – The minimum length of the centre line of the curve and straight portion is 1075m but may be longer depending upon the slope used. See Table 6-1 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.



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



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



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

Figure 6-6 Approach and take-off climb surfaces with different slope design categories

Elevated heliports

6.2.7 The obstacle limitation requirements for elevated heliports must conform to the requirements for surface-level heliports specified in 6.2.1 to 6.2.5.

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

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

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

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

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

Helidecks

6.2.9 A helideck must have an obstacle-free sector.

6.2.10 There must be no fixed obstacles within the obstacle-free sector above the obstacle-free surface.

6.2.11 In the immediate vicinity of the helideck, obstacle protection for helicopters must be provided below the heliport level. This protection must extend over an arc of at least 180 degrees with the origin at the centre of the FATO, with a descending gradient having a ratio of one unit horizontally to five units vertically from the edges of the FATO within the 180-degree sector. This descending gradient may be reduced to a ratio of one unit horizontally to three units vertically within the 180-degree sector for multi-engine helicopters operated in performance class 1 or 2 (*see Figure 6-7.*)

6.2.12 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 must not exceed a height of 25 cm above the TLOF. Beyond that arc, out to an overall distance of a further 0.21 D measured from the end of the first sector, the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05 D above the level of the TLOF. (*See Figure 6-8.*)

6.2.13 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 must not exceed a height of 5 cm above the TLOF. Beyond that arc, out to an overall distance of 0.83 D from the centre of the TLOF, the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05 D above the level of the TLOF. (See Figure 6-9.)

Shipboard heliports

Purpose-built heliports located forward or aft

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

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

6.2.15 Forward and aft of a TLOF of 1 D and larger must 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 must 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.

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

6.2.17 To provide further protection from obstacles fore and aft of the TLOF, rising surfaces with gradients of one unit vertically to five units horizontally must extend from the entire length of the edges of the two 150-degree sectors. These surfaces must extend for a horizontal distance equal to at least 1 D of the largest helicopter the TLOF is intended to serve and must not be penetrated by any obstacle. (See Figure 6-10.)

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

6.2.18 No objects must 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 must only be present if they do not represent a hazard to helicopters.

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

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

Winching areas

6.2.21 An area designated for winching on-board ships must be comprised of a circular clear zone of diameter 5 m and, extending from the perimeter of the clear zone, a concentric manoeuvring zone of diameter 2 D. (See Figure 6-12.)

6.2.22 The manoeuvring zone must 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.

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

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

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

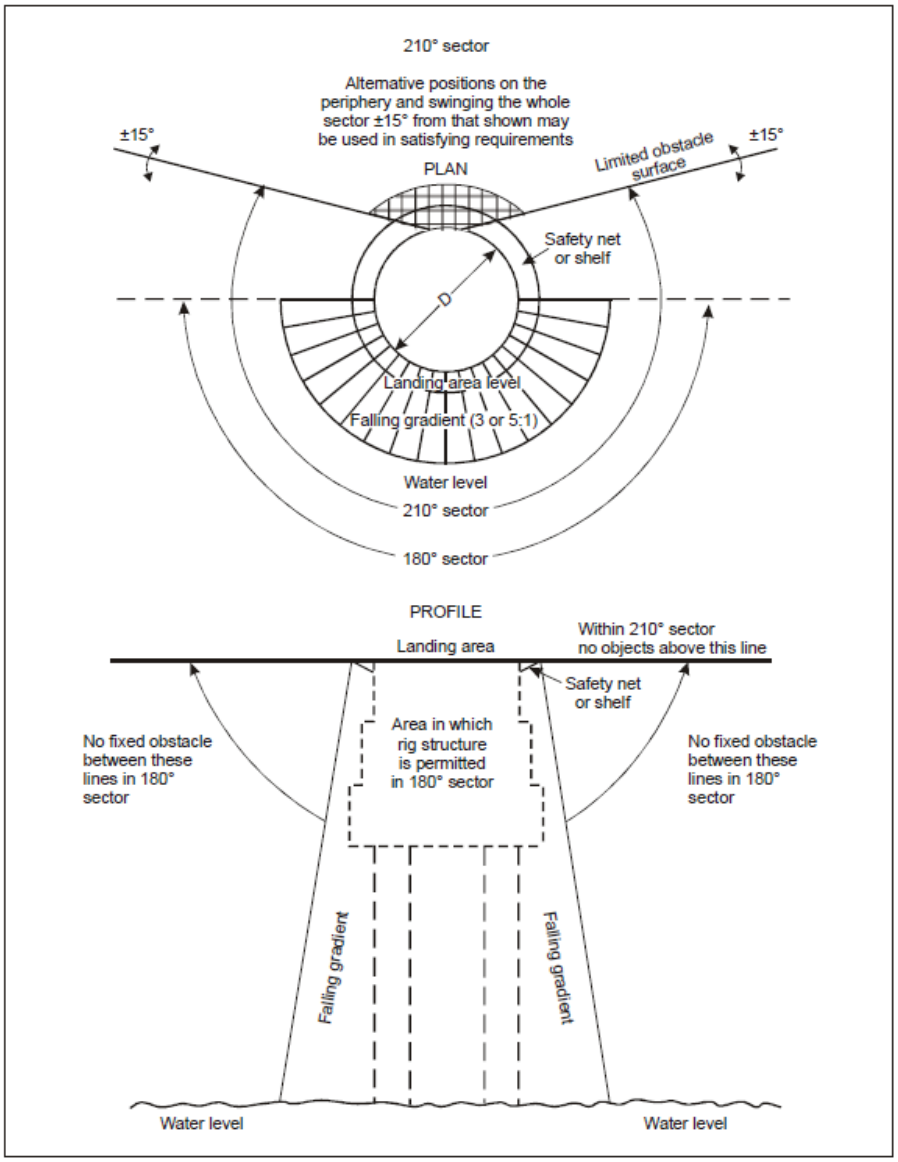


Figure 6-7. Helideck obstacle-free sector

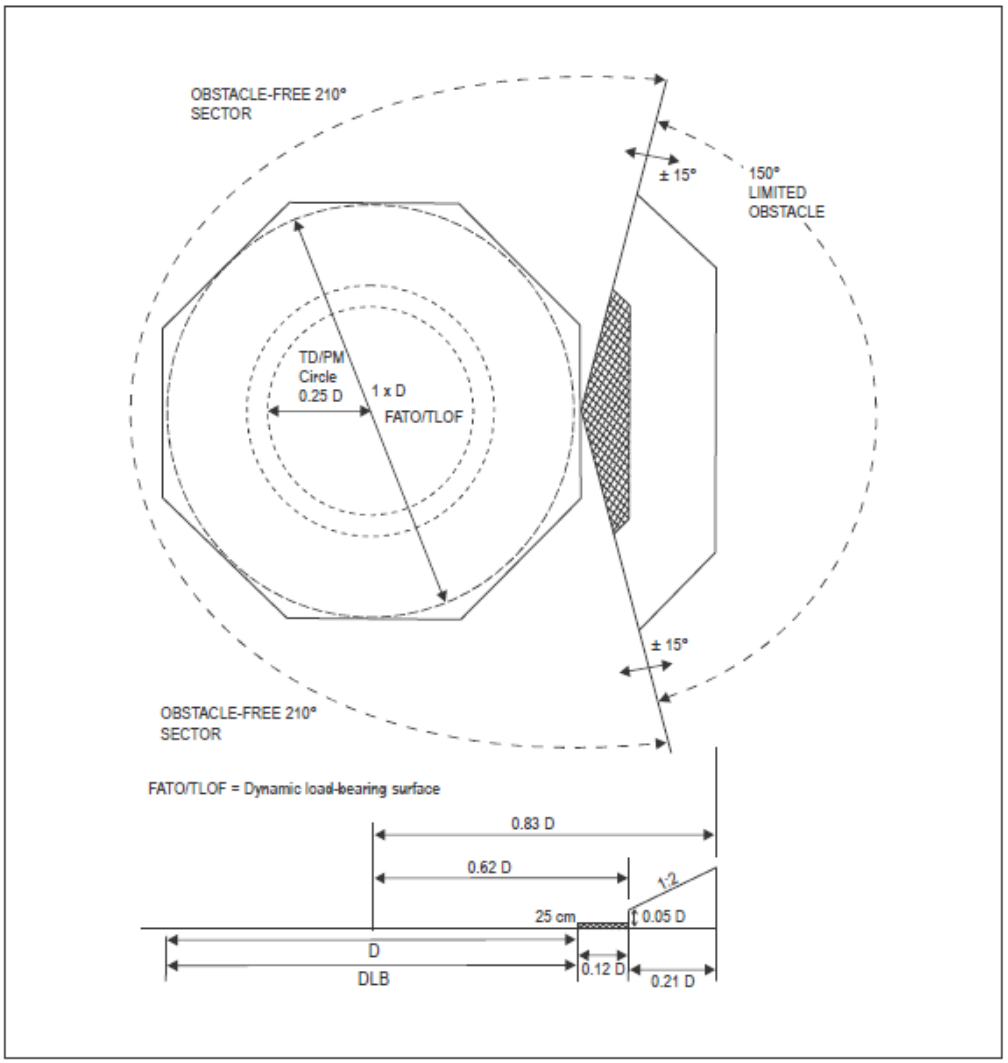


Figure 6-8. Helideck obstacle limitation sectors and surfaces for a FATO and coincidental TLOF of 1 D and larger

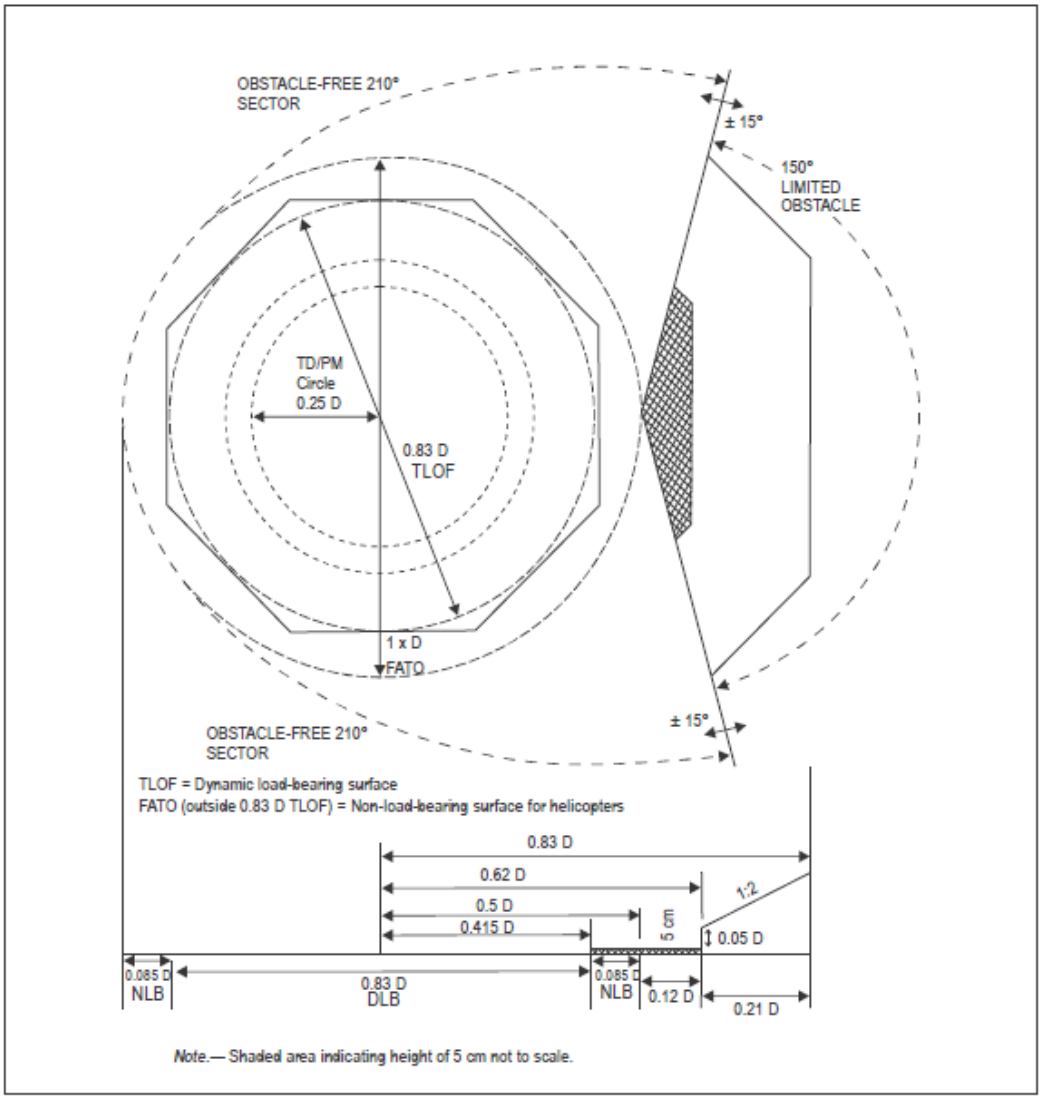


Figure 6-9. Helideck obstacle limitation sectors and surfaces for a TLOF of 0.83 D and larger

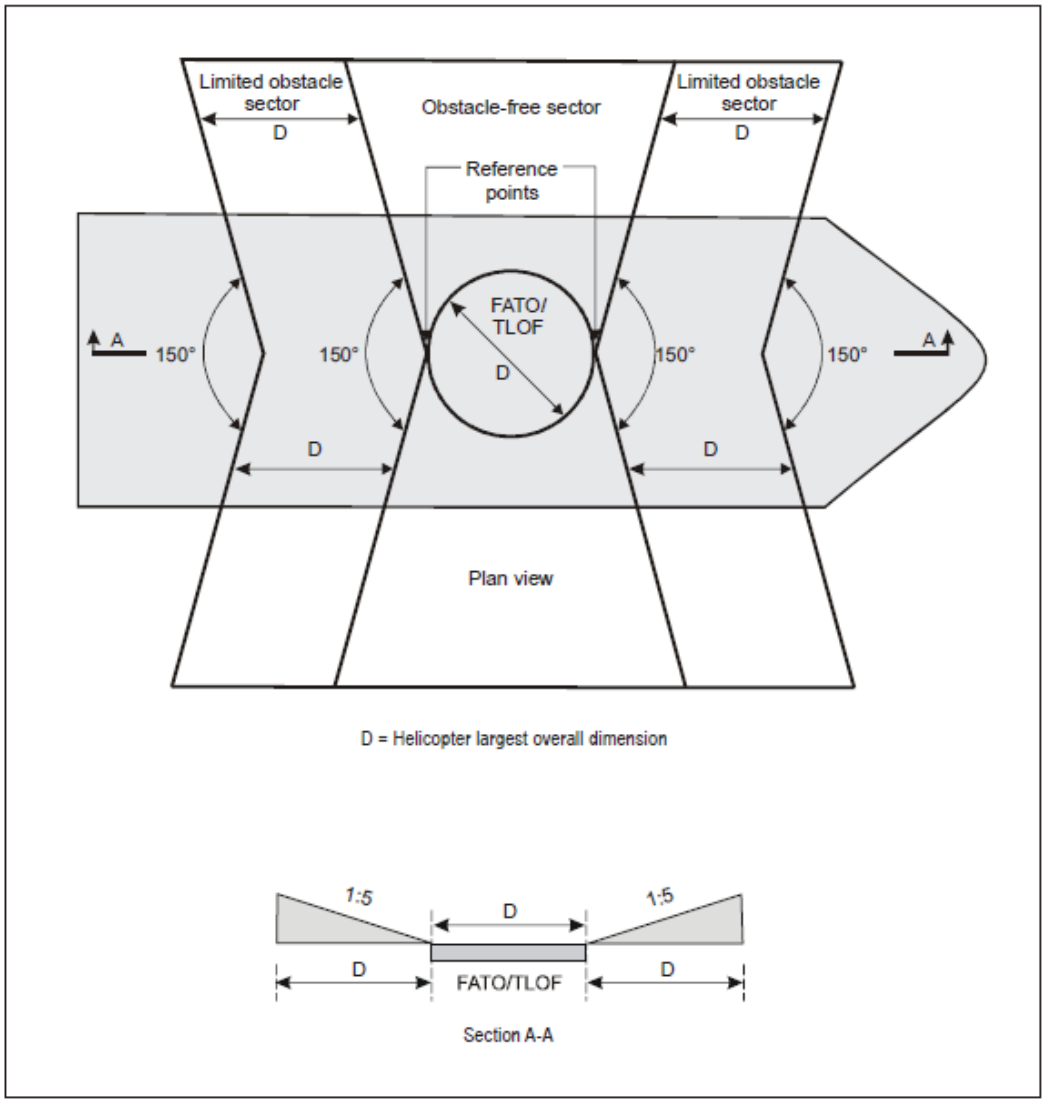


Figure 6-10. Amidship's location — shipboard heliport obstacle limitation surfaces

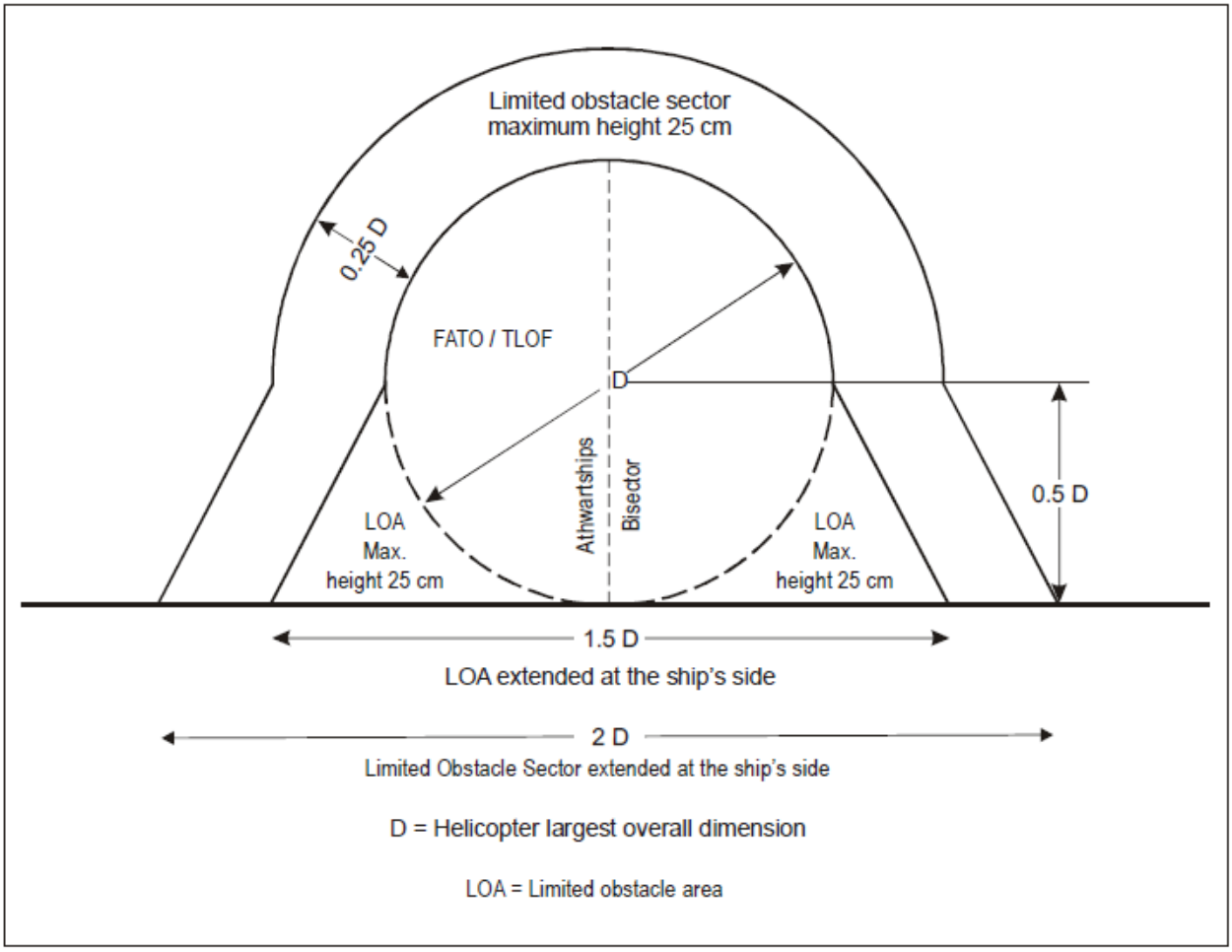


Figure 6-11 Ships-side non-purpose-built heliport obstacle limitation sectors and surfaces

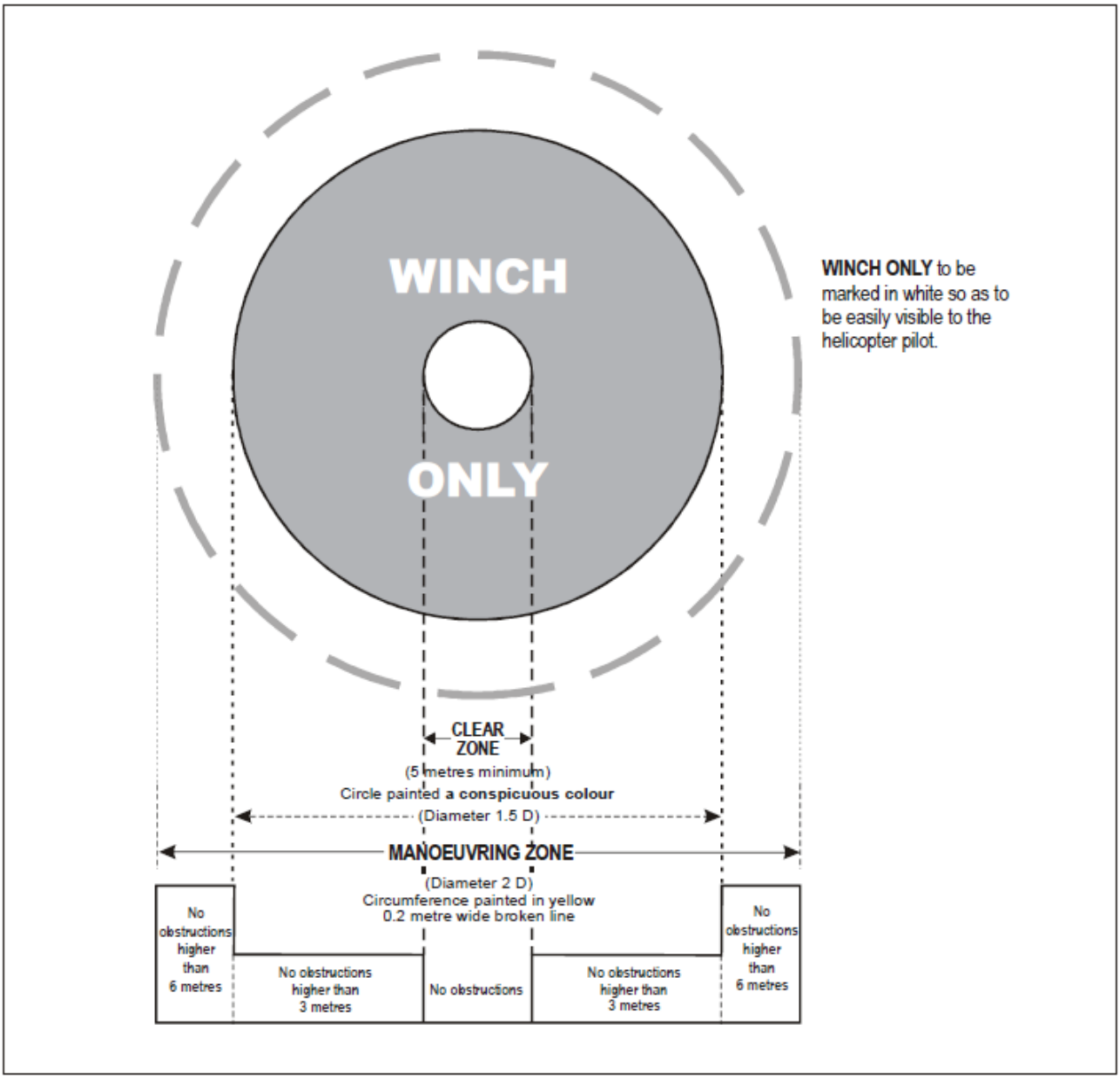


Figure 6-12 Winching area of a ship

7 Visual Aids

7.1 Indicators

7.1.1 Wind direction indicators

Application

7.1.1.1 A heliport must be equipped with at least one wind direction indicator.

Location

7.1.1.2 A wind direction indicator must 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 must be visible from a helicopter in flight, in a hover or on the movement area.

Characteristics

7.1.1.3 A wind direction indicator must be constructed so that it gives a clear indication of the direction of the wind and a general indication of the wind speed.

7.1.1.4 A wind direction indicator at a heliport intended for use at night must be illuminated.

7.2 Markings and markers

7.2.1 Heliport identification marking

Application

7.2.1.1 A heliport identification marking must be provided at a heliport.

Location – All FATOs except runway-type FATOs

7.2.1.2 A heliport identification marking must be located at or near the centre of the FATO.

7.2.1.3 On a FATO which contains a TLOF, a heliport identification marking must be located in the FATO so the position of it coincides with the centre of the TLOF.

Location – Runway-type FATOs

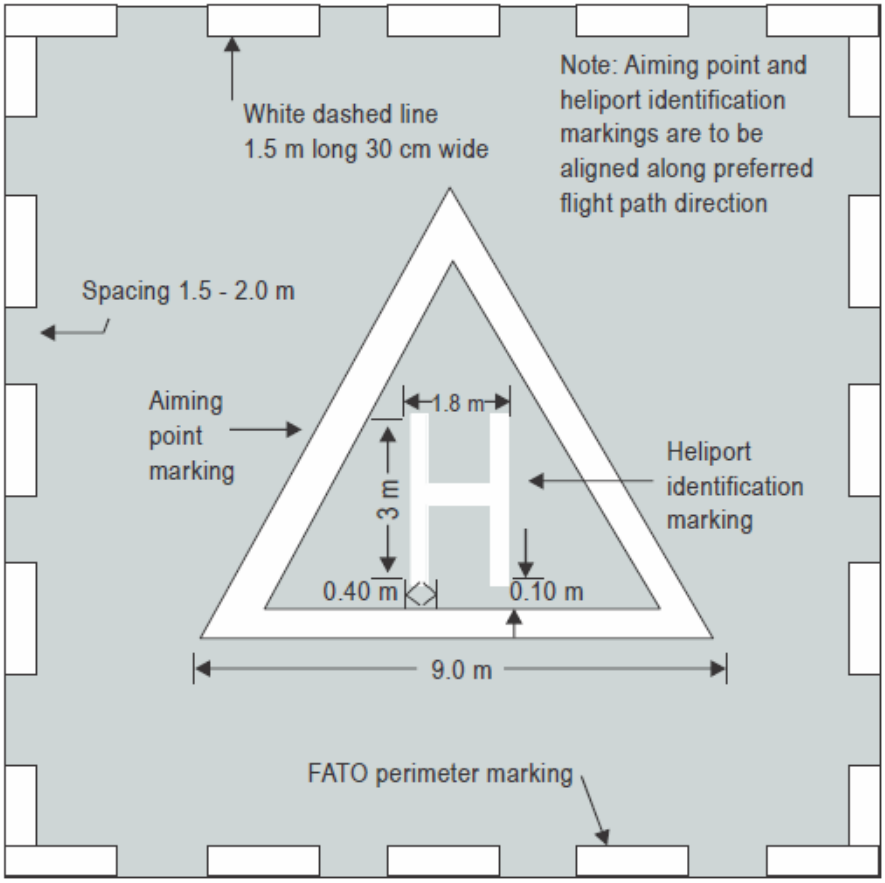
7.2.1.4 A heliport identification marking must be located in the FATO and when used in conjunction with FATO designation markings, must be displayed at each end of the FATO as shown in Figure 7-3.

Characteristics

7.2.1.5 A heliport identification marking, except for a heliport at a hospital, must consist of a letter H, in white. The dimensions of the H marking must be no less than those shown in Figure 7-4 and where the marking is used for a runway-type FATO, its dimensions must be increased by a factor of 3 as shown in Figure 7-3.

7.2.1.6 A heliport identification marking for a heliport at a hospital must consist of a letter H, red in colour, on a white cross made of squares adjacent to each of the sides of a square containing the H as shown in Figures 7-2 and 7-4.

7.2.1.7 A heliport identification marking must be oriented with the cross arm of the H at right angles to the preferred final approach direction. For a helideck the cross arm must 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 must be parallel with the side of the ship.



Note.— The aiming point, heliport identification and FATO perimeter markings are white and may be edged with a 10 cm black border to improve contrast.

Figure 7-1 Combined heliport identification, aiming point and FATO perimeter marking

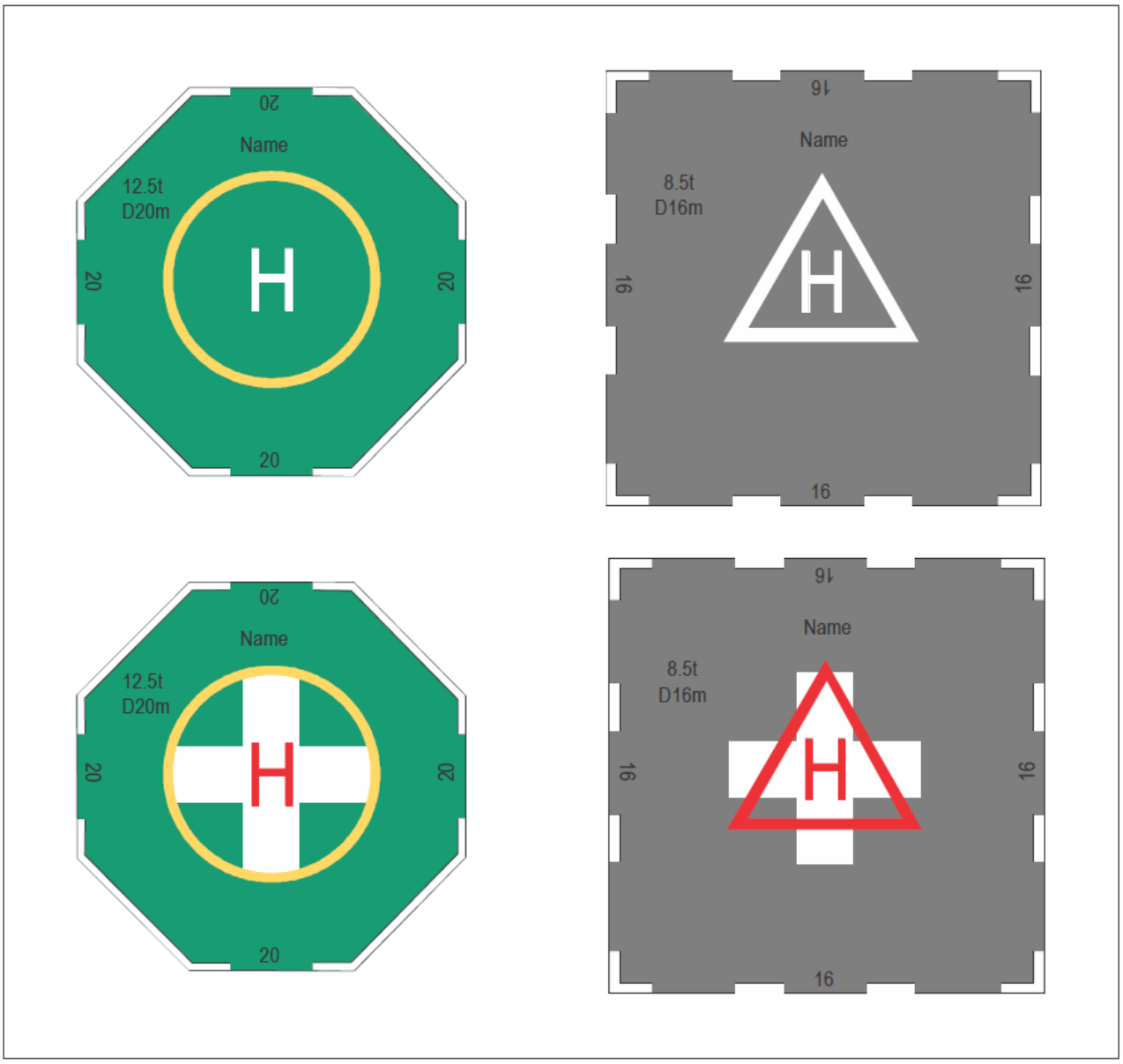


Figure 7-2 Heliport identification markings with TLOF and aiming markings for heliport and hospital heliport

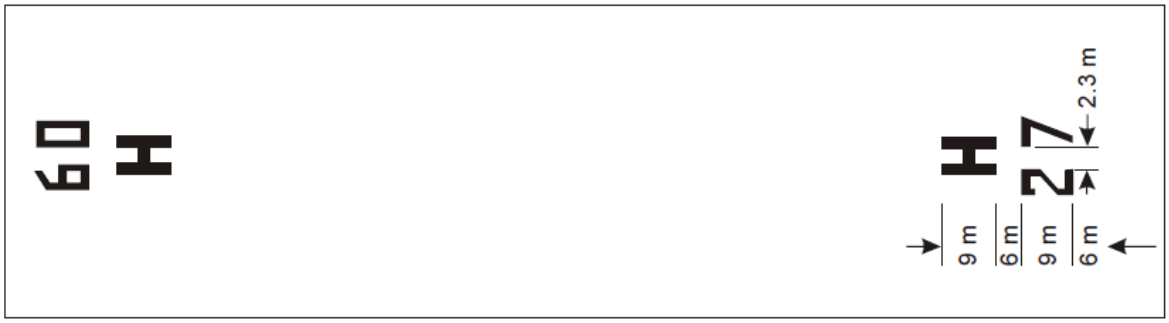


Figure 7-3 FATO designation marking and heliport identification marking for a runway-type FATO

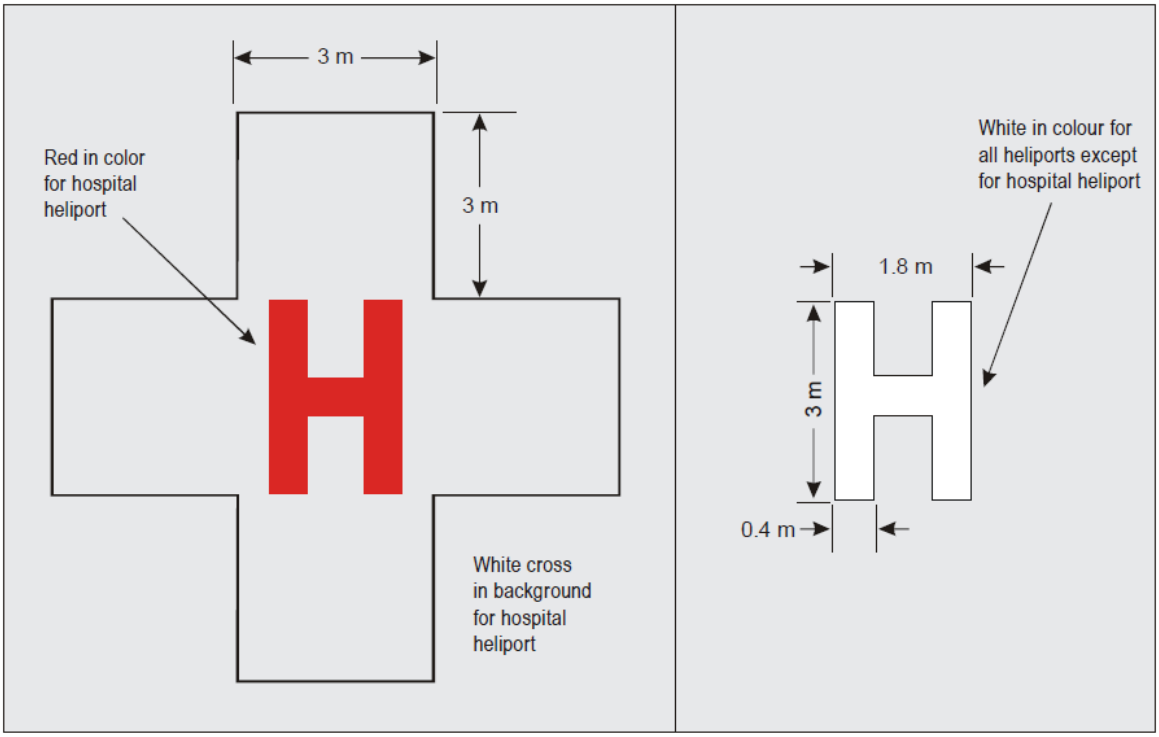


Figure 7-4 Hospital heliport identification and heliport identification marking

7.2.2 Maximum allowable mass marking

Application

7.2.2.1 A maximum allowable mass marking must be displayed at an elevated heliport, a helideck and a shipboard heliport.

Characteristics

7.2.2.2 A maximum allowable mass marking must consist of a one-, two- or three-digit number.

7.2.2.3 The maximum allowable mass must be expressed in tonnes (1,000 kg) rounded to the nearest 1,000 kg followed by a letter “t”.

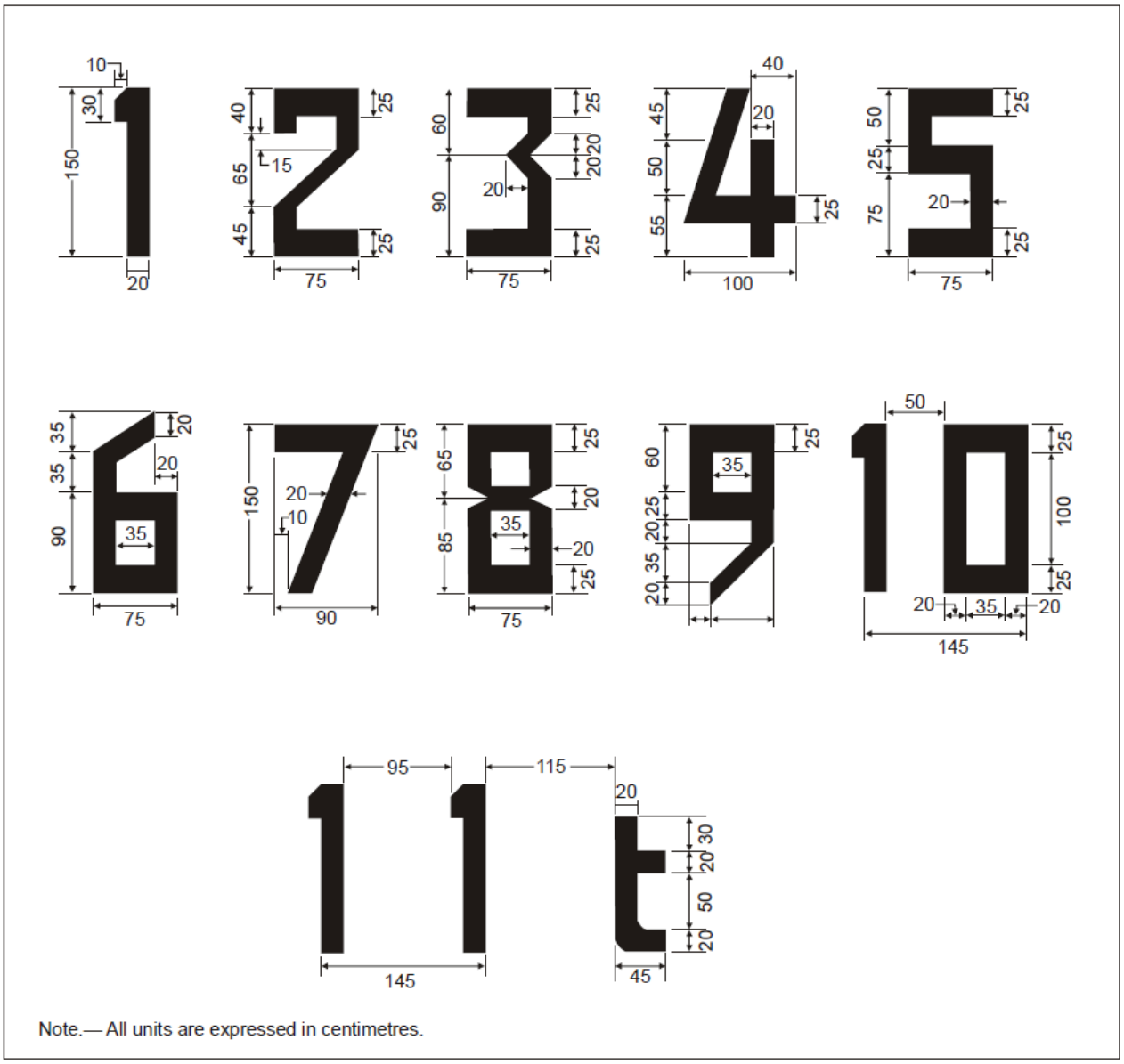


Figure 7-5 Form and proportions of numbers and letters

7.2.3 D-value marking

Application- All FATOs except runway-type FATOs

7.2.3.1 The D-value marking must be displayed at a helideck and at a shipboard heliport.

Application- Runway-type FATOs

7.2.3.2 The D-value marking must be displayed at surface-level and elevated heliports.

Location

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

Characteristics

7.2.3.4 The D-value marking must be white. The D-value marking must be rounded to the nearest whole metre or foot with 0.5 rounded down.

7.2.4 FATO perimeter marking or markers for surface-level heliports

Application

7.2.4.1 FATO perimeter marking or markers must be provided at a surface-level heliport where the extent of a FATO with a solid surface is not self-evident.

Location

7.2.4.2 The FATO perimeter marking or markers must be located on the edge of the FATO.

Characteristics – Runway-type FATOs

7.2.4.3 The perimeter of the FATO must 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.

7.2.4.4 A FATO perimeter marking must 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.

7.2.4.5 FATO perimeter markings must be white.

7.2.4.6 A FATO perimeter marker must have dimensional characteristics as shown in Figure 7-6.

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

Characteristics – All FATOs except runway-type FATOs

7.2.4.8 For an unpaved FATO the perimeter must be defined with flush in-ground markers. The FATO perimeter markers must 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 must be defined.

7.2.4.9 For a paved FATO the perimeter must be defined with a dashed line. The FATO perimeter marking segments must 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 must be defined.

7.2.4.10 FATO perimeter markings and flush-in ground markers must be white.

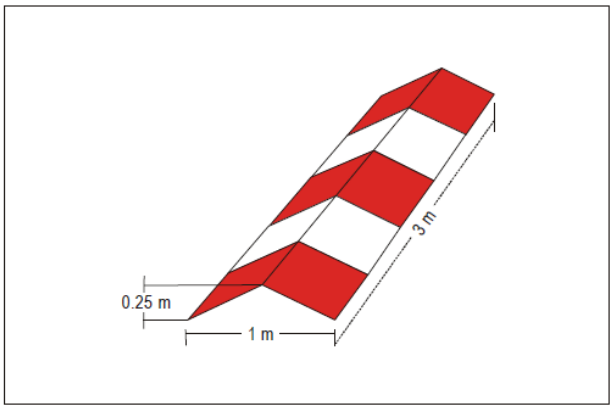


Figure 7-6 Runway-type FATO edge marker

7.2.5 FATO designation markings for runway-type FATOs

Location

7.2.5.1 A FATO designation marking must be located at the beginning of the FATO as shown in Figure 7-3.

Characteristics

7.2.5.2 A FATO designation marking must consist of a two-digit number. The two-digit number must be the whole number nearest to one-tenth of the magnetic North when viewed from the direction of approach. When this rule would give a single digit number, it must be preceded by a zero. The marking, as shown in Figure 7-3, must be supplemented by the heliport identification marking.

7.2.6 Aiming point marking

Location – Runway-type FATOs

7.2.6.1 The aiming point marking must be located within the FATO.

Location – All FATOs except runway-type FATOs

7.2.6.2 The aiming point marking must be located at the centre of the FATO as shown in Figure 7-1.

Characteristics

7.2.6.3 The aiming point marking must be an equilateral triangle with the bisector of one of the angles aligned with the preferred approach direction. The marking must consist of continuous lines providing a contrast with the background colour, and the dimensions of the marking must conform to those shown in Figure 7-7.

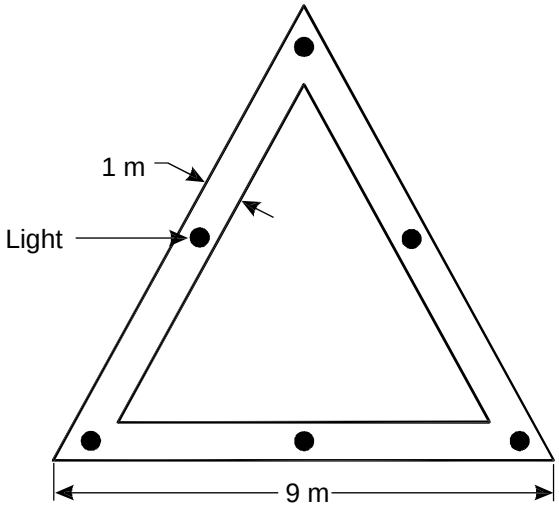


Figure 7-7 Aiming point marking

7.2.7 TLOF perimeter marking

Application

7.2.7.1 A TLOF perimeter marking must be displayed on a TLOF located in a FATO at a surface-level heliport if the perimeter of the TLOF is not self-evident.

7.2.7.2 A TLOF perimeter marking must be displayed on an elevated heliport, a helideck and a shipboard heliport.

Location

7.2.7.3 A TLOF perimeter marking must be located along the edge of the TLOF.

Characteristics

7.2.7.4 A TLOF perimeter marking must consist of a continuous white line with a width of at least 30 cm.

7.2.8 Touchdown/ position marking

Application

7.2.8.1 A TDPM must be provided for a helicopter to touch down or be accurately placed in a specific position.

7.2.8.2 The TDPM must be:

(a) when there is no limitation on the direction of touchdown/positioning, a touchdown/positioning circle (TDPC) marking; and

(b) when there is a limitation on the direction of touchdown/positioning:

(c) for unidirectional applications, a shoulder line with an associated centreline; or

(d) for multidirectional applications, a TDPC marking with prohibited landing sector(s) marked.

Location

7.2.8.3 The inner edge/inner circumference of the touchdown/positioning marking must be at a distance of 0.25 D from the centre of the area in which the helicopter is to be positioned.

7.2.8.4 On a helideck, the centre of the TDPC marking must 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 is necessary and would not impair safety.

7.2.8.5 Prohibited landing sector markings, when provided, must be located on the TDPM, within the relevant headings, and extend to the inner edge of the TLOF perimeter marking.

Characteristics

7.2.8.6 The inner diameter of the TDPC must be 0.5 D of the largest helicopter the area is intended to serve.

7.2.8.7 A TDPM must have a line width of at least 0.5 m. For a helideck and a purpose-built shipboard heliport, the line width must be at least 1 m.

7.2.8.8 The length of a shoulder line must be 0.5D of the largest helicopter the area is intended to serve.

7.2.8.9 The prohibited landing sector marking, when provided, must be indicated by white and red hatched markings as shown in Figure 7-8.

7.2.8.10 The TDPM must take precedent when used in conjunction with other markings on the TLOF except for the prohibited landing sector marking.

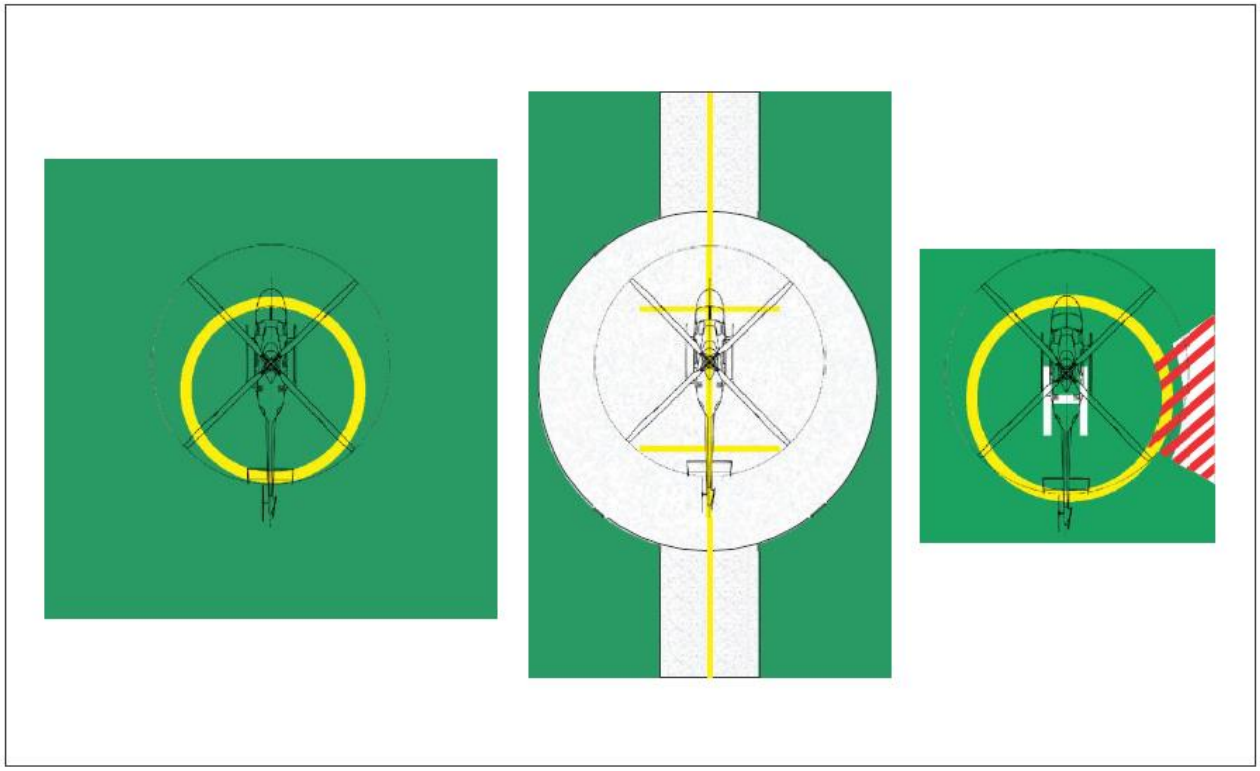


Figure 7-8 Multidirectional TDPC with no limitations (left). Unidirectional marking shoulder line with associated centreline (centre). Multidirectional TDPC with prohibited landing sector marking (right)

7.2.9 Heliport name marking

Characteristics

7.2.9.1 A heliport name marking must consist of the name or the alphanumeric designator of the heliport as used in the radio (R/T) communications.

7.2.10 Helideck obstacle-free sector (chevron) marking

Application

7.2.10.1 A helideck with adjacent obstacles that penetrate above the level of the helideck must have an obstacle-free sector marking.

Location

7.2.10.2 A helideck obstacle-free sector marking must 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.

Characteristics

7.2.10.3 The helideck obstacle-free sector marking must indicate the location of the obstacle-free sector and the directions of the limits of the sector.

7.2.10.4 The height of the chevron must not be less than 30 cm.

7.2.10.5 The chevron must be marked in a conspicuous colour.

7.2.11 Helicopter taxiway markings and markers

Application

7.2.11.1 The centre line of a helicopter taxiway must be identified with a marking.

Location

7.2.11.2 Helicopter taxiway markings must be along the centre line and, if required, along the edges of a helicopter ground taxiway.

7.2.11.3 Helicopter taxiway edge markers must be located at a distance of 1 m to 3 m beyond the edge of the helicopter taxiway.

7.2.11.4 Helicopter taxiway edge markers must 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.

Characteristics

7.2.11.5 On a paved taxiway, a helicopter taxiway centre line marking must be a continuous yellow line 15 cm in width.

7.2.11.6 On an unpaved taxiway that will not accommodate painted markings, a helicopter taxiway centre line must 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.

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

7.2.11.8 A helicopter taxiway edge marker must be frangible to the wheeled undercarriage of a helicopter.

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

7.2.11.10 A helicopter ground taxiway edge marker must be blue.

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

7.2.12 Helicopter air taxi-route markings and markers

Application

7.2.12.1 The centre line of a helicopter air taxi route must be identified with markers or markings.

Location

7.2.12.2 A helicopter air taxi-route centre line marking or flush in-ground centre line marker must be located along the centre line of the helicopter air taxi-route.

Characteristics

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

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

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

7.2.13 Helicopter stand markings

Application

7.2.13.1 A helicopter stand perimeter marking must be provided.

7.2.13.2 A helicopter stand must be provided with the appropriate TDPM. See Figure 7-8.

Location

7.2.13.3 The TDPM, alignment lines and lead-in/lead-out lines must be located such that every part of the helicopter can be contained within the helicopter stand during positioning and permitted manoeuvring.

7.2.13.4 Alignment lines and lead-in/lead-out lines must be located as shown in Figure 7-9.

Characteristics

7.2.13.5 A helicopter stand perimeter marking must consist of a continuous yellow line and have a line width of 15 cm.

7.2.13.6 The TDPM must have the characteristics described in section 7.2.8 above.

7.2.13.7 Alignment lines and lead-in/lead-out lines must be continuous yellow lines and have a width of 15 cm.

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

7.2.13.9 Stand identification markings must be marked in a contrasting colour so as to be easily readable.

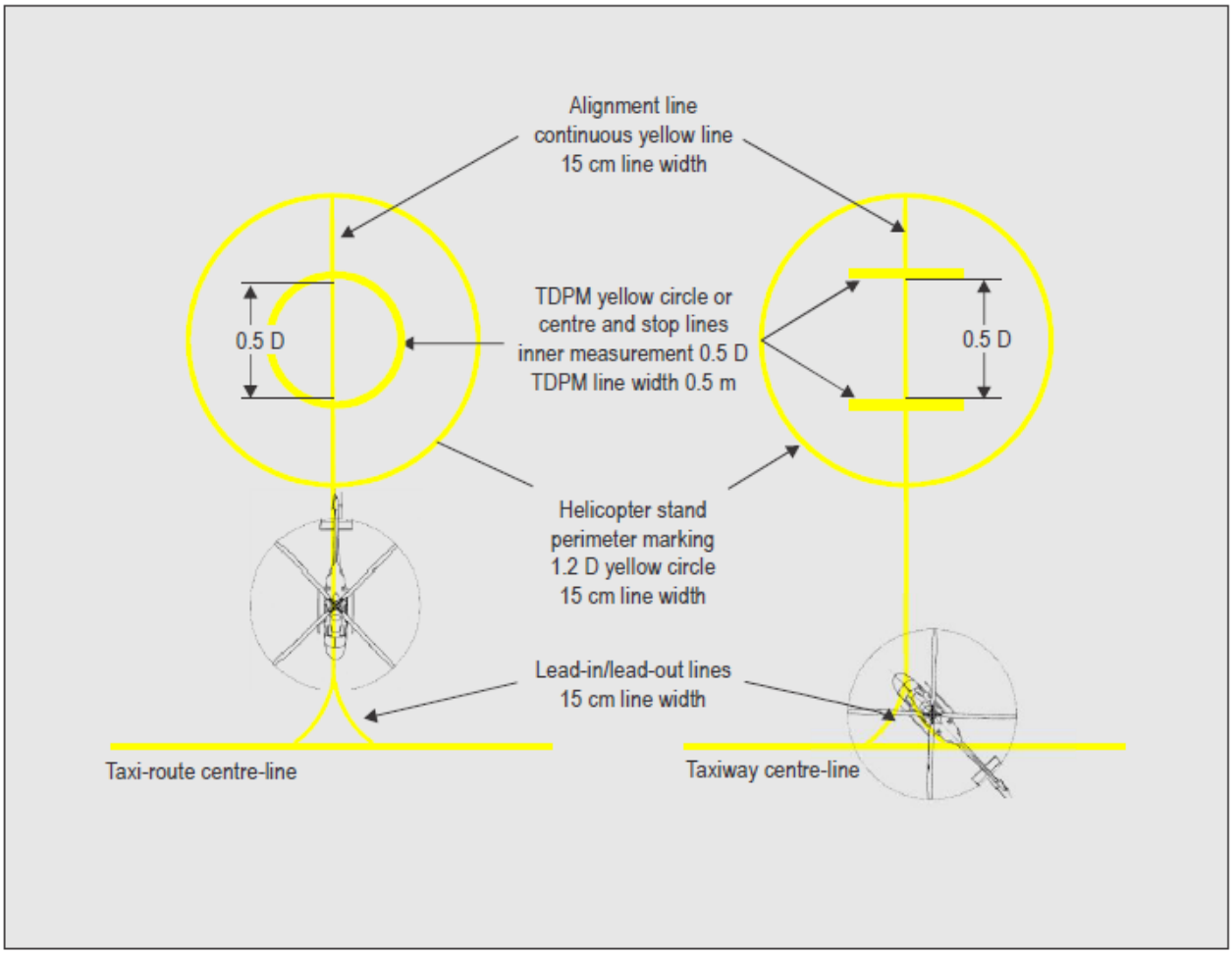


Figure 7-9. Helicopter stand markings

7.2.14 Flight path alignment guidance marking

Location

7.2.14.1 The flight path alignment guidance marking must 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.

Characteristics

7.2.14.2 A flight path alignment guidance marking must consist of one or more arrows marked on the TLOF, FATO and/or safety area surface as shown in Figure 7-10. The stroke of the arrow(s) must be 50 cm in width and at least 3 m in length. When combined with a flight path alignment guidance lighting system it must take the form shown in Figure 7-10 which includes the scheme for marking “heads of the arrows” which are constant regardless of stroke length.

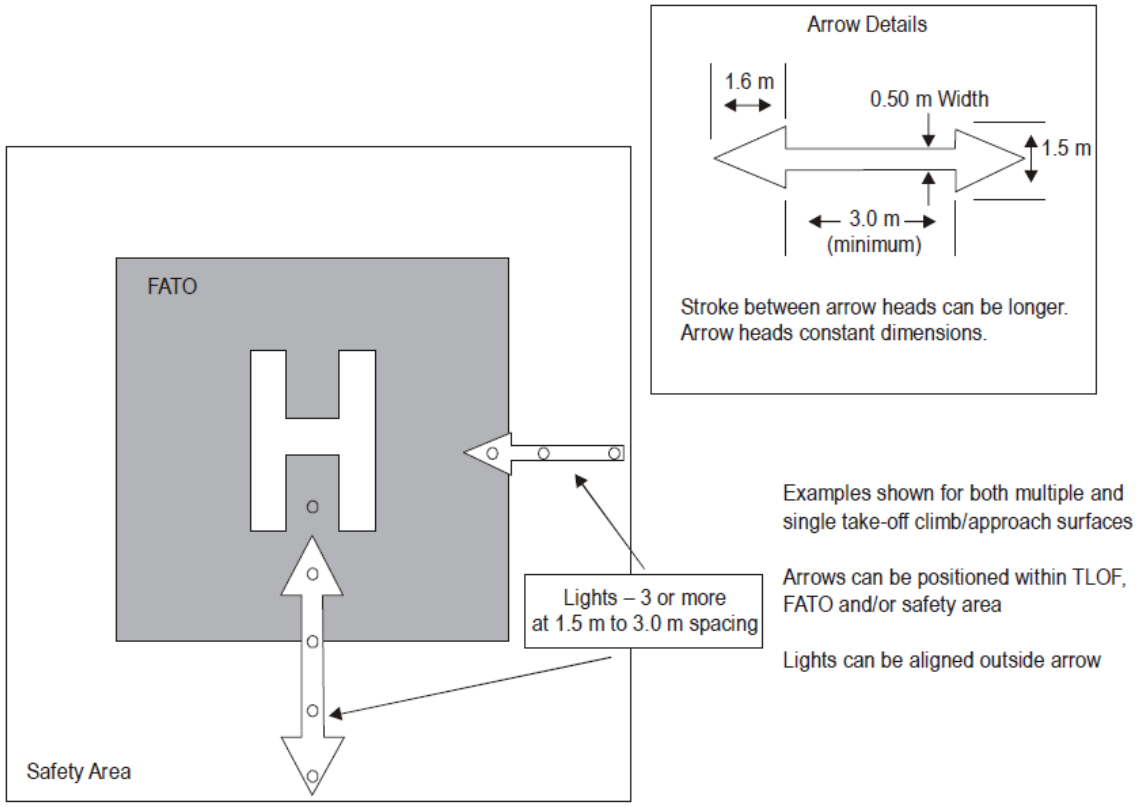


Figure 7-10 Flight path alignment guidance markings and lights

7.3 Lights

7.3.1 Heliport beacon

Location

7.3.1.1 The heliport beacon must 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[10].

Characteristics

7.3.1.2 The heliport beacon must emit repeated series of equispaced short duration white flashes in the format in Figure 7-11.

7.3.1.3 The light from the beacon must show at all angles of azimuth.

[10] Where a heliport beacon is likely to dazzle pilots at short range, it may be switched off during the final stages of the approach and landing.

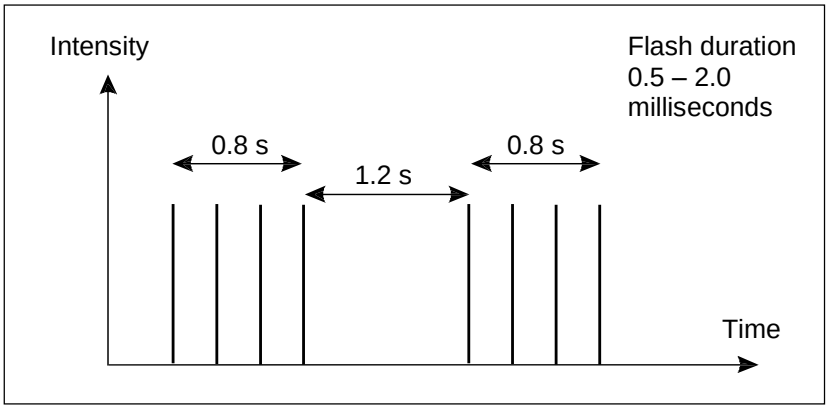


Figure 7-11 Heliport beacon flash characteristics

7.3.2 Approach lighting system

Location

7.3.2.1 The approach lighting system must be located in a straight line along the preferred direction of approach.

Characteristics

7.3.2.2 The steady lights must be omnidirectional white lights.

7.3.2.3 Sequenced flashing lights must be omnidirectional white lights.

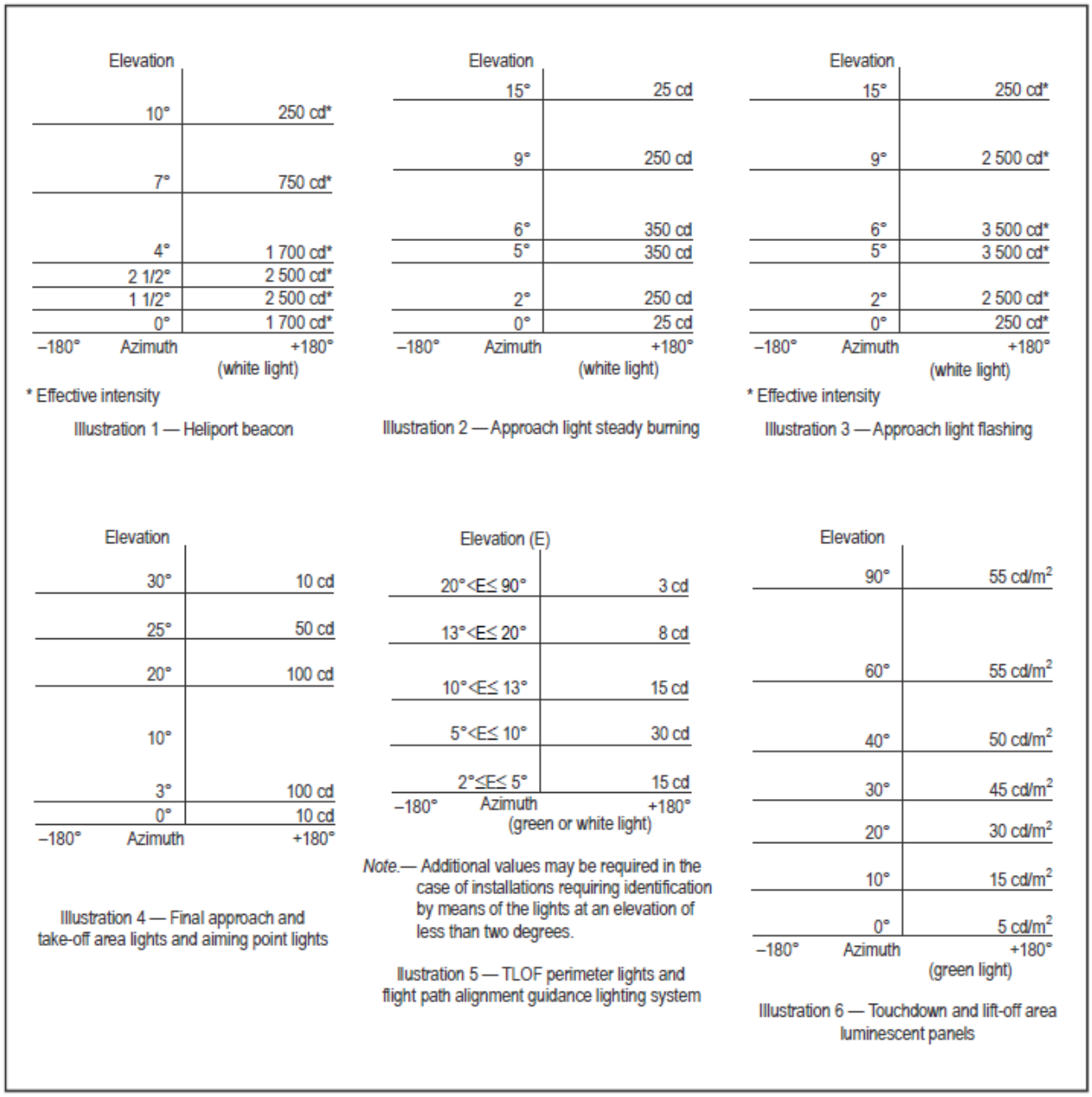


Figure 7-12. Isocandela diagrams

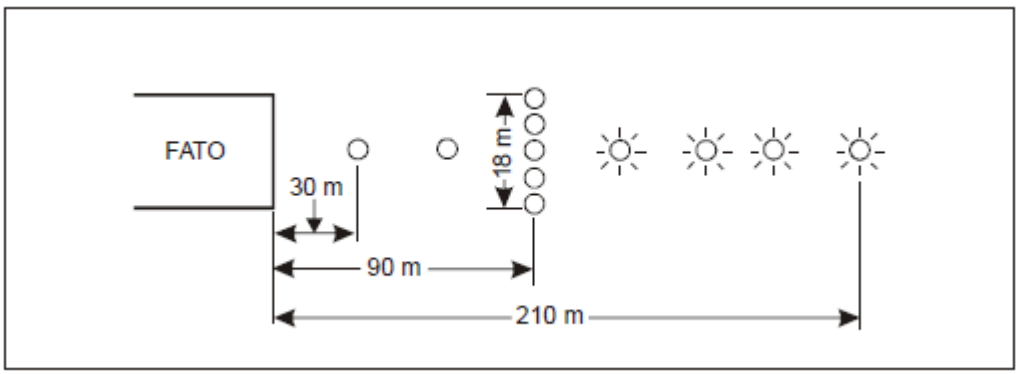


Figure 7-13. Approach lighting system

7.3.3 Flight path alignment guidance lighting system

Location

7.3.3.1 The flight path alignment guidance lighting system must 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.

Characteristics

7.3.3.2 The lights must be steady omnidirectional inset white lights.

7.3.4 FATO lighting systems for onshore surface-level heliports

Application

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

Location

7.3.4.2 FATO lights must be placed along the edges of the FATO. The lights must be uniformly spaced as follows:

(a) for an area in the form of a square or rectangle, at intervals of not more than 50m with a minimum of four lights on each side including a light at each corner; and

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

Characteristics

7.3.4.3 FATO lights must be fixed omnidirectional lights showing white. Where the intensity of the lights is to be varied the lights must show variable white.

7.3.5 Aiming point lights

Location

7.3.5.1 Aiming point lights must be collocated with the aiming point marking.

Characteristics

7.3.5.2 Aiming point lights must form a pattern of at least six omnidirectional white lights as shown in Figure 7-7. The lights must be inset when a light extending above the surface could endanger helicopter operations.

7.3.6 TLOF lighting system

Application

7.3.6.1 A TLOF lighting system must be provided at a heliport intended for use at night.

7.3.6.2 For a surface-level heliport, lighting for the TLOF in a FATO must consist of one or more of the following:

(a) perimeter lights;

(b) floodlighting;

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

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

(a) perimeter lights; and

(b) ASPSL and/or LPs to identify the TDPM and/or floodlighting to illuminate the TLOF.

Location

7.3.6.4 TLOF perimeter lights must 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 must be:

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

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

7.3.6.5 TLOF perimeter lights must 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 must 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 7.3.6.4 (b) there must be a minimum of fourteen lights.

7.3.6.6 The TLOF perimeter lights must 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.

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

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

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

7.3.6.10 TLOF floodlights must be located so as to avoid glare to pilots in flight or to personnel working on the area. The arrangement and aiming of floodlights must be such that shadows are kept to a minimum.

Characteristics

7.3.6.11 The TLOF perimeter lights must be fixed omnidirectional lights showing green.

7.3.6.12 At a surface-level heliport, ASPSL or LPs must emit green light when used to define the perimeter of the TLOF.

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

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

7.3.6.15 For a helideck or shipboard heliport, the TLOF perimeter lights must not exceed a height of 5 cm, or for a FATO/TLOF, 15 cm.

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

7.3.6.17 The LPs must not extend above the surface by more than 2.5 cm.

7.3.6.18 The spectral distribution of TLOF area floodlights must be such that the surface and obstacle markings can be correctly identified.

7.3.7 Helicopter stand floodlighting

Characteristics

7.3.7.1 The spectral distribution of stand floodlights must be such that the colours used for surface and obstacle marking can be correctly identified.

7.3.7.2 Horizontal and vertical illuminance must be sufficient to ensure that visual cues are discernible for required manoeuvring and positioning, and essential operations around the helicopter can be performed expeditiously without endangering personnel or equipment.

7.3.8 Taxiway lights

7.3.8.1 Visual aids for denoting obstacles outside and below the obstacle limitation surface

7.3.9 Floodlighting of obstacles

Application

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

Location

7.3.9.2 Obstacle floodlights must be arranged so as to illuminate the entire obstacle and as far as practicable in a manner so as not to dazzle pilots.

8 Heliport Emergency Response

8.1 Rescue and firefighting

Applicability

8.1.1 Rescue and firefighting equipment and services must be provided at helidecks and at elevated heliports located above occupied structures.

Level of protection provided

8.1.2 For the application of primary media the discharge rate (in litres/minute) applied over the assumed practical critical area (in m^2) must be predicated on a requirement to bring any fire which may occur on the heliport under control within one minute, measured from activation of the system at the appropriate discharge rate.

8.2 Means of escape

8.2.1 Elevated heliports and helidecks must be provided with a main access and at least one additional means of escape.

9 Instrument Heliports with Non-Precision And/ Or Precision Approaches and Instrument Departures

9.1 Heliport Data

9.1.1 Heliport elevation

9.1.1.1 The elevation of the TLOF and/or the elevation and geoid undulation of each threshold of the FATO (where appropriate) must be measured in accordance with the appropriate system of coordinates and reported to the AIS provider to the accuracy of:

(a) one-half metre or foot for non-precision approaches; and

(b) one-quarter metre or foot for precision approaches.

9.1.2 Heliport dimensions and related information

9.1.2.1 The following additional data must be measured or described, as appropriate, for each facility provided on an instrument heliport:

— distances to the nearest metre or foot of localizer and glide path elements comprising an instrument landing system (ILS) or azimuth and elevation antenna of a microwave landing system (MLS) in relation to the associated TLOF or FATO extremities.

9.2 Physical Characteristics

9.2.1 Surface-level and elevated heliports

Safety areas

9.2.1.1 A safety area surrounding an instrument FATO must extend (See Figure 9-1):

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

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

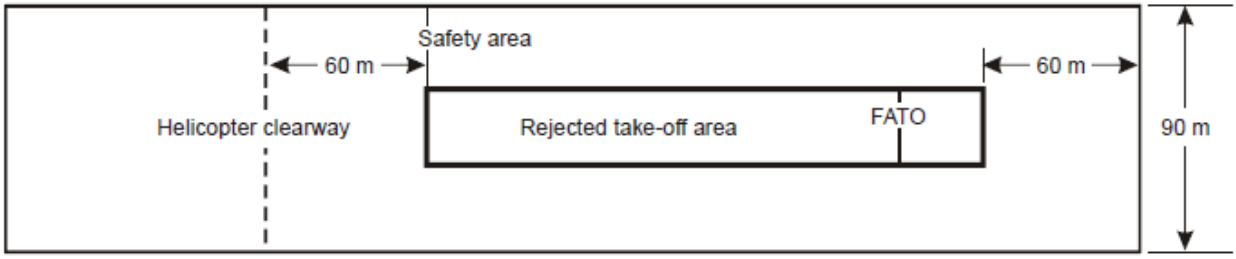


Figure 9-1 Safety area for instrument FATO

9.3 Obstacle environment

9.3.1 Obstacle limitation surfaces and sectors

Approach surface

9.3.1.1 Characteristics. The limits of an approach surface must comprise:

(a) an inner edge horizontal and equal in length to the minimum specified width 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;

(i) for an instrument FATO with a non-precision approach, diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO;

(ii) for an instrument FATO with a precision approach, diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO, to a specified height above FATO, and then diverging uniformly at a specified rate to a specified final width and continuing thereafter at that width for the remaining length of the approach surface; and

(iii) an outer edge horizontal and perpendicular to the centre line of the approach surface and at a specified height above the elevation of the FATO.

9.3.2 Obstacle limitation requirements

9.3.2.1 The following obstacle limitation surfaces[11] must be established for an instrument FATO with a non-precision and/or precision approach:

(a) take-off climb surface;

(b) approach surface; and

(c) transitional surfaces.

9.3.2.2 The slopes of the obstacle limitation surfaces must not be greater than, and their other dimensions not less than, those specified in Tables 9-1 to 9-3.

[11] See Figures 9-2 to 9-5.

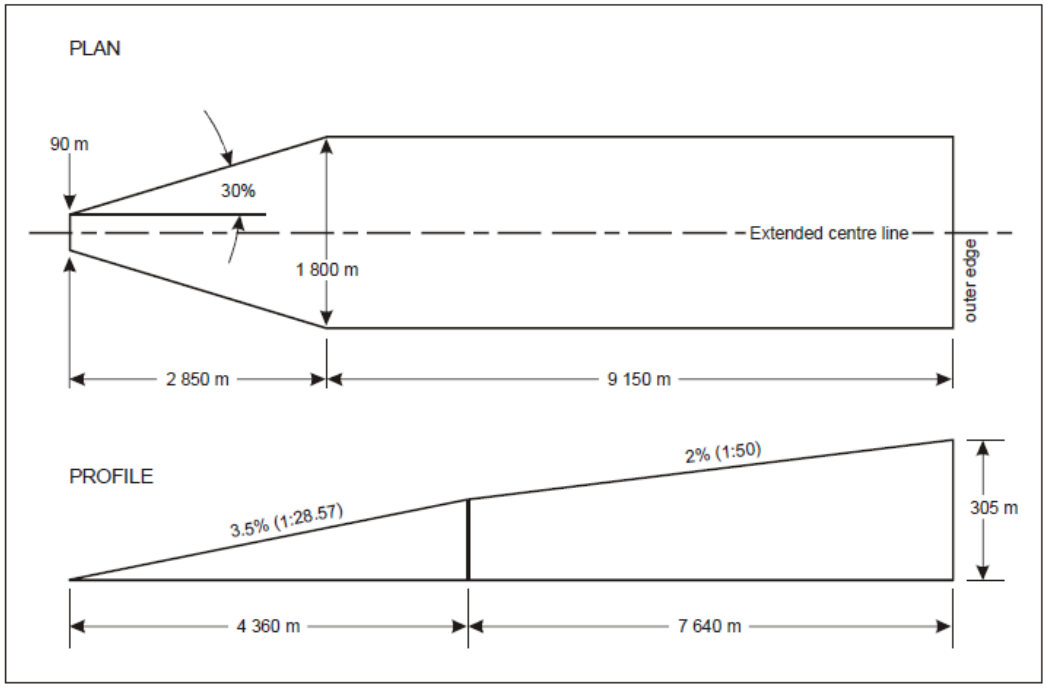


Figure 9-2 Take-off climb surface for instrument FATO

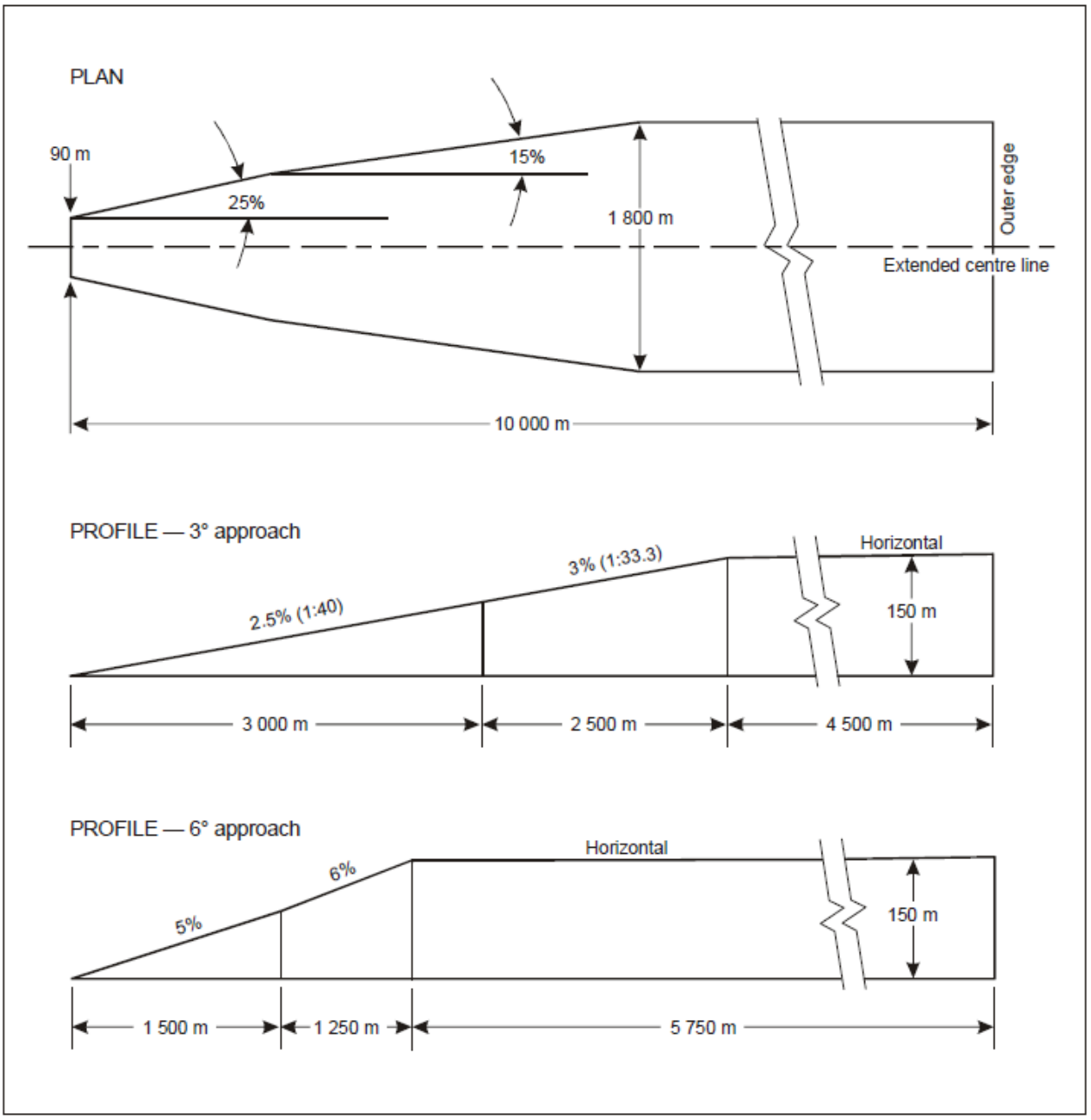


Figure 9-3 Approach surface for precision approach FATO

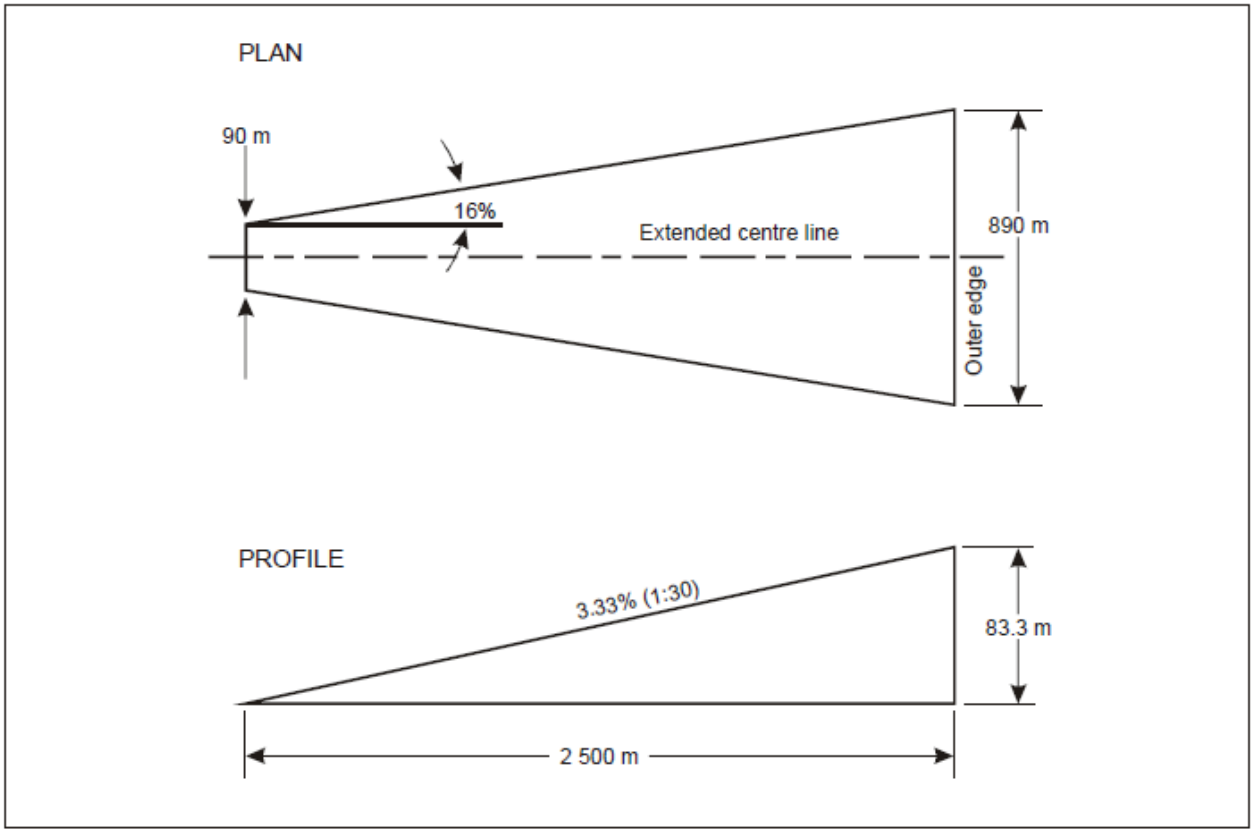


Figure 9-4 Approach surface for non-precision approach FATO

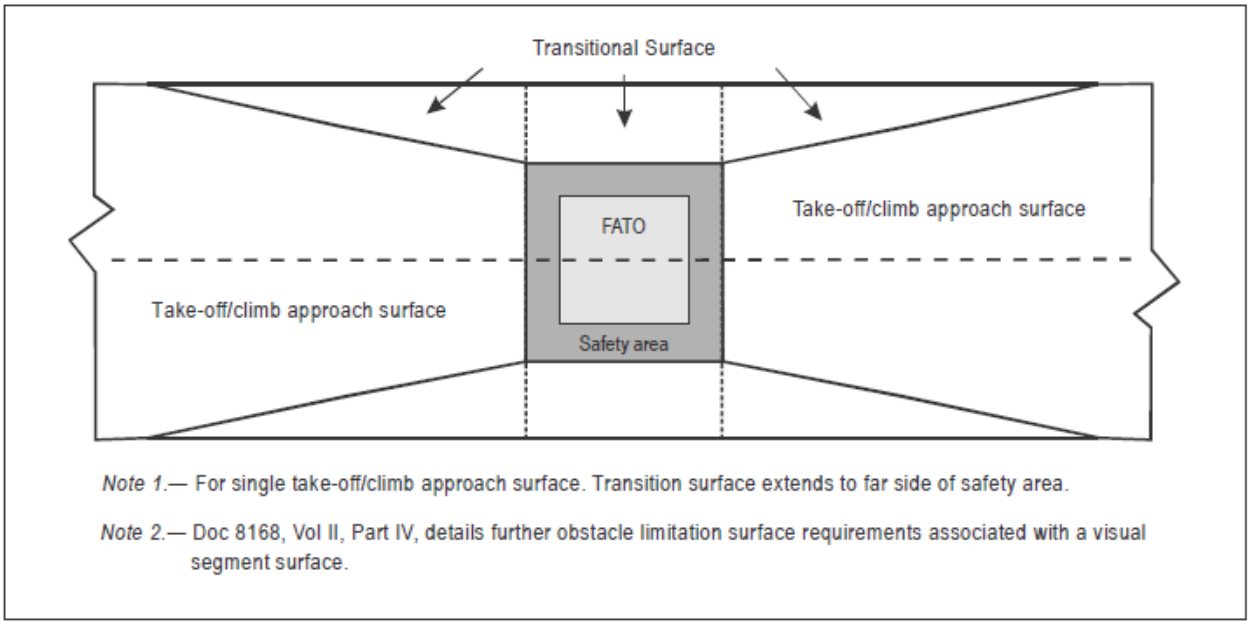


Figure 9-5 Transitional surfaces for an instrument FATO with a non-precision and/or precision approach

Table 9-1 Dimensions and slopes of obstacle limitation surfaces
Instrument (non-precision) FATO

Surface and dimensions		
APPROACH SURFACE		Width of safety area boundary
Width of inner edge		
Location of inner edge		
First section		
Divergence	— day	16%
	— night	
Length	— day	2 500 m
	— night	
Outer width	— day	890 m
	— night	
Slope (maximum)		3.33%
Second section		
Divergence	— day	—
	— night	
Length	— day	—
	— night	
Outer width	— day	—
	— night	
Slope (maximum)		—
Third Section		
Divergence		—
Length	— day	—
	— night	
Outer width	— day	—
	— night	
Slope (maximum)		—
TRANSITIONAL		
Slope		20%
Height		45 m

Table 9-2 Dimensions and slopes of obstacle limitation surfaces
Instrument (precision) FATO

	3° approach				*6° approach*			
	Height above FATO				*Height above FATO*			
Surface and dimensions	*90 m (300 ft)*	*60 m (200 ft)*	*45 m (150 ft)*	*30 m (100 ft)*	*90 m (300 ft)*	*60 m (200 ft)*	*45 m (150 ft)*	*30 m (100 ft)*
APPROACH SURFACE								
Length of inner edge	90 m	90 m	90 m	90 m	90 m	90 m	90 m	90 m
Distance from end of FATO	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60m
Divergence each side to height above FATO	25%	25%	25%	25%	25%	25%	25%	25%
Distance to height above FATO	1 745 m	1 163 m	872 m	581 m	870 m	580 m	435 m	290 m
Width at height above FATO	962 m	671 m	526 m	380 m	521 m	380 m	307.5 m	235 m
Divergence to parallel section	15%	15%	15%	15%	15%	15%	15%	15%
Distance to parallel section	2 793 m	3 763 m	4 246 m	4 733 m	4 250 m	4 733 m	4 975 m	5 217 m
Width of parallel section	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m
Distance to outer edge	5 462 m	5 074 m	4 882 m	4 686 m	3 380 m	3 187 m	3 090 m	2 993 m
Width at outer edge	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m	1 800 m
Slope of first section	2.5% (1:40)	2.5% (1:40)	2.5% (1:40)	2.5% (1:40)	5% (1:20)	5% (1:20)	5% (1:20)	5% (1:20)
Length of first section	3 000 m	3 000 m	3 000 m	3 000 m	1 500 m	1 500 m	1 500 m	1 500 m
Slope of second section	3% (1:33.3)	3% (1:33.3)	3% (1:33.3)	3% (1:33.3)	6% (1:16.66)	6% (1:16.66)	6% (1:16.66)	6% (1:16.66)
Length of second section	2 500 m	2 500 m	2 500 m	2 500 m	1 250 m	1 250 m	1 250 m	1 250 m
Total length of surface	10 000 m	10 000 m	10 000 m	10 000 m	8 500 m	8 500 m	8 500 m	8 500 m
TRANSITIONAL								
Slope	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m

Table 9-3 Dimensions and slopes of obstacle limitation surfaces
Straight take-off

Surface and dimensions		*Instrument*
TAKE-OFF CLIMB		
Width of inner edge		90 m
Location of inner edge		Boundary of end of clearway
First section		
Divergence	— day	30%
	— night	
Length	— day	2 850 m
	— night	
Outer width	— day	1 800 m
	— night	
Slope (maximum)		3.5%
Second section		
Divergence	— day	parallel
	— night	
Length	— day	1 510 m
	— night	
Outer width	— day	1 800 m
	— night	
Slope (maximum)		3.5%*
Third Section		
Divergence		parallel
Length	— day	7 640 m
	— night	
Outer width	— day	1 800 m
	— night	
Slope (maximum)		2%

* *This slope exceeds the maximum mass one-engine-inoperative climb gradient of many helicopters which are currently operating.*

10 Heliport Maintenance

10.1 Pavements

10.1.1 The surfaces of all movement areas such as FATO, taxiway, TLOF and helicopter stands, and areas adjacent to such areas, must be inspected and their conditions monitored regularly as part of a heliport preventive and corrective maintenance programme with the objective of avoiding and eliminating any foreign object debris that might cause damage to helicopters or impair the operation of helicopter systems.

10.1.2 The surface of the movement areas must be maintained in a condition such as to prevent formation of harmful irregularities.

10.2 Removal of contaminants

10.2.1 Standing water, mud, dust, sand, oil, and other contaminants must be removed from the surface of movement areas that are in use as rapidly and completely as possible to minimize accumulation.

10.2.2 Chemicals which may have harmful effects on helicopters or pavements, or chemicals which may have toxic effects on the heliport environment, must not be used.

10.3 Visual aids

10.3.1 A system of preventive maintenance of visual aids must be employed to ensure lighting and marking system reliability.

Appendix 1 Definitions

The following list contains definitions of terms that are used in AS-6, with the meanings given below.

Aerodrome reference point (ARP). The designated geographical location of an aerodrome

Approach surface. An inclined plane or a combination of planes or, when a turn is involved, a complex surface[12] sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO.

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

Design D. The D of the design helicopter.

Design helicopter. The helicopter type having the largest overall length and greatest maximum certificated take-off mass for which a heliport has been designed. Both attributes may not reside in the same helicopter.

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

Declared distances — heliports.

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

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

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

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

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

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

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

[12] See Table 6-1 for dimensions and slopes of surfaces. See Figures 6-1, 6-2, 6-3 and 6-4 for depiction of surfaces.

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

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

Helicopter taxiway. A defined path on a heliport intended for the ground movement of helicopters and that may be combined with an air taxi-route to permit both ground and air taxiing.

Helicopter taxi-route. A defined path established for the movement of helicopters from one part of a heliport to another.

(a) Air taxi-route. A marked taxi-route intended for air taxiing.

(b) Ground taxi-route. A taxi-route centred on a taxiway.

Helideck. A heliport located on a fixed or floating offshore facility such as an exploration and/or production unit used for the exploitation of oil or gas.

Heliport. An aerodrome, including one that may be on a structure, used wholly or intended to be used wholly or in part by helicopters only.

Heliport elevation. The elevation of the highest point of the FATO.

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

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

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

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

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

Operations in Performance Class 1 (PC1). Operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area.

Operations in Performance Class 2 (PC2). Operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

Operations in Performance Class 3 (PC3). Operations with performance such that, in the event of an engine failure at any time during the flight, a forced landing will be required.

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

Point-in-space (PinS) visual segment. This is the segment of a helicopter PinS approach procedure from the MAPt to the landing location for a PinS “proceed visually” procedure. This visual segment connects the PinS to the landing location.

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

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

Rejected take-off distance required (RTODRH). The horizontal distance required from the start of the take-off to the point where the helicopter comes to a full stop following an engine failure and rejection of the take-off at the take-off decision point.

Rejected take-off distance available (RTODAH). The length of the final approach and take-off area declared available and suitable for helicopters operating in Performance Class 1 to complete a rejected take-off.

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

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

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

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

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

Take-off climb surface. An inclined plane, a combination of planes or, when a turn is involved, a complex surface[13] sloping upwards from the end of the safety area and centred on a line passing through the centre of the FATO.

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

Touchdown/positioning circle (TDPC). A touchdown positioning marking (TDPM) in the form of a circle used for omnidirectional positioning in a TLOF.

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

Transitional surface. 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).

[13] See Table 6-1 for dimensions and slopes of surfaces. See Figures 6-1, 6-2, 6-3 and 6-4 for depiction of surfaces.

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

Appendix 2 Abbreviations and symbols

Abbreviations

AIP	Aeronautical Information Publication
AIRAC	Aeronautical information regulation and control
AIS	Aeronautical Information Services
APAPI	Abbreviated precision approach path indicator
ARP	Aerodrome reference point
ASPSL	Arrays of segmented point source lighting
cd	Candela
cm	Centimetre
DIFFS	Deck integrated firefighting system
FAS	Fixed application system
FATO	Final approach and take-off area
FFAS	Fixed foam application system
FMS	Fixed monitor system
ft	Foot
GNSS	Global navigation satellite system
HAPI	Helicopter approach path indicator
HFM	Helicopter flight manual
HRP	Helicopter reference point
Hz	Hertz
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
ISO	International Organization for Standardization
kg	Kilogram
km/h	Kilometre per hour
kt	Knot
L	Litre
lb	Pounds
LDAH	Landing distance available (helicopters)
LED	Light emitting diode
L/min	Litre per minute
LOA	Limited obstacle area
LOS	Limited obstacle sector
LP	Luminescent panel
m	Metre
MAPt	Missed approach point
MLS	Microwave Landing System
MSL	Mean sea level
MTOM	Maximum take-off mass
NOTAM	Notice to Airmen
NVIS	Night vision imaging system
OFS	Obstacle-free sector
OLS	Obstacle limitation surface
PANS-AIM	Procedures for Air Navigation Services for Aeronautical Information Management or ICAO Doc 10066
PANS-OPS	Procedures for Air Navigation Services for Aircraft Operations or ICAO Doc 8168

PAPI	Precision approach path indicator
PC1	Performance Class 1
PC2	Performance Class 2
PC3	Performance Class 3
PFAS	Portable foam application system
PinS	Point-in-space
RFF	Rescue and firefighting
RFFS	Rescue and firefighting service
RMS	Ring-main system
R/T	Radiotelephony or radio communication
RTOD	Rejected take-off distance
RTODAH	Rejected take-off distance available (helicopters)
RTODR	Rejected take-off distance required
s	Second
SNOWTAM	Snow Warning to Airmen
t	Tonne (1 000 kg)
TDPC	Touchdown/positioning circle
TDPM	Touchdown/positioning marking
TLOF	Touchdown and lift-off area
TODAH	Take-off distance available (helicopters)
TMA	Terminal control area
UCW	Undercarriage width
UTC	Coordinated Universal Time
VASI	Visual approach slope indicator
VSS	Visual segment surface
W1	Width factor

Symbols

°	Degree
=	Equals
%	Percentage
±	Plus or minus