

RA 3531 - Helicopter Landing Site - Physical Characteristics

Rationale

The physical characteristics of a Helicopter Landing Site (HLS) are defined to reduce the risk associated with an Air System flying over it, and when taking-off or landing, including: when taxiing, during an incident or accident scenario, to enable safe use by rescue and firefighting vehicles, when loading and unloading passengers, crew and cargo, and when servicing.

Contents

- 3531(1): Permanent Helicopter Landing Site - Final Approach and Take Off area
- 3531(2): Permanent Helicopter Landing Site - Clearway
- 3531(3): Permanent Helicopter Landing Site - Touchdown and Lift Off area
- 3531(4): Permanent Helicopter Landing Site - Safety Area
- 3531(5): Permanent Helicopter Landing Site - Ground Taxiway
- 3531(6): Permanent Helicopter Landing Site - Air Taxiway
- 3531(7): Permanent Helicopter Landing Site - Air Transit Route - Design
- 3531(8): Permanent Helicopter Landing Site - Apron
- 3531(9): Domestic Helicopter Landing Site

Regulation 3531(1)

Permanent Helicopter Landing Site - Final Approach and Take Off area

3531(1) Heads of Establishments (HoEs) and Aviation Duty Holder (ADH) Facing organizations **shall** ensure that Final Approach and Take Off areas (FATO) are provided at an HLS.

Acceptable Means of Compliance 3531(1)

Permanent Helicopter Landing Site - Final Approach and Take Off area

1. **Location.** The FATO **should** be located to minimize the influence of the surrounding environment, including turbulence, which could have an adverse impact on helicopter operations. 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 **should** be as prescribed in Table 1.

Table 1. FATO minimum separation distance

If Air System mass and/or helicopter mass are	Distance between FATO edge and runway edge or taxiway edge
Up to but not including 3175kg	60m
3175kg up to, but not including, 5760kg	120m
5760kg up to, but not including, 100,000kg	180m
100,000kg and over	250m

2. A FATO **should** be located away from:
- a. Taxiway intersections or holding points where jet engine efflux is likely to cause high turbulence; and
 - b. Areas where Air System vortex wake generation is likely to exist.
3. **Dimension.** The dimensions of a FATO for Class 1 Helicopters **should** be:
- a. As defined in the Helicopter Flight Manual; and

**Acceptable
Means of
Compliance
3531(1)**

- b. Of no smaller width than the largest overall dimension of the helicopter it is intended to serve.
4. The dimensions of a FATO for Class 2 or 3 Helicopters **should** be:
- a. $1D^1$ of the largest helicopter when the Maximum Take-Off Mass (MTOM) of helicopters the FATO is intended is more than 3175kg;
- b. $0.83D$ of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3175kg or less.
5. **Slope.** The slope **should** be designed to promote the most rapid drainage of water from the FATO.
6. The mean slope of the FATO, in any direction, **should not** exceed 3%.
7. No portion of a FATO **should** have a local slope exceeding:
- a. 5% where the HLS is intended to be used by helicopters operated in performance Class 1; and
- b. 7% where the HLS is intended to be used by helicopters operated in performance Class 2 or 3.
8. **Surface.** The surface of the FATO **should**:
- a. Be constructed without characteristics that would adversely affect the safety of the helicopter operating from the FATO.
- b. Be resistant to the effects of rotor downwash;
- c. Be free of irregularities that would adversely affect the take-off or landing of helicopters;
- d. Have bearing strength sufficient to accommodate a rejected take-off by helicopters operated in performance Class 1; and
- e. Provide ground-effect.
9. The surface of a FATO surrounding a Touchdown and Lift Off area (TLOF) intended for use by helicopters operated in performance Classes 2 and 3 **should** be static load-bearing.

**Guidance
Material
3531(1)**

Permanent Helicopter Landing Site - Final Approach and Take Off area

10. Local conditions, such as elevation and temperature, may need to be considered when determining the size of a FATO.
11. If turbulence mitigating design measures are warranted but not practical, operational limitations may need to be considered under certain wind conditions.

Civil Equivalence.

12. This regulation is in line with International Civil Aviation Organization (ICAO) Annex 14 Vol II para 3.1.

**Regulation
3531(2)**

Permanent Helicopter Landing Site - Clearway

- 3531(2) HoEs and ADH Facing organizations **shall** ensure that a Clearway is provided for aerodromes intended for Performance Class 1 Helicopters.

**Acceptable
Means of
Compliance
3531(2)**

Permanent Helicopter Landing Site - Clearway

13. **Location.** The Clearway **should** be located beyond the end of the FATO.
14. **Dimension.** The width of a Clearway **should** be no less than that of the associated safety area².

¹ Where D is the largest overall dimension of the helicopter using the HLS.

² See RA 3531(4).

**Acceptable
Means of
Compliance
3531(2)**

15. **Slope.** The ground in a Clearway **should** remain below a plane having an upward slope of 3%, the lower limit of this plane being a horizontal line which is located on the periphery of the FATO.

**Guidance
Material
3531(2)**

Permanent Helicopter Landing Site - Clearway

16. A clearway is not required for Performance Class 2 and 3 helicopters.

Civil Equivalence.

17. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

**Regulation
3531(3)**

Permanent Helicopter Landing Site - Touchdown and Lift Off area

3531(3) HoEs and ADH Facing organizations **shall** ensure that one TLOF is located within the FATO, or that one or more TLOFs are to be collocated with helicopter stands.

**Acceptable
Means of
Compliance
3531(3)**

Permanent Helicopter Landing Site - Touchdown and Lift Off area

18. **Location.** Where a TLOF is located within a FATO which can contain a circle of diameter more than 1D, the centre of the TLOF **should** be located not less than 0.5D from the edge of the FATO.

19. **Dimension.** The TLOF **should** be of sufficient size to contain a circle of diameter of at least 0.83D of the largest helicopter the area is intended to serve.

20. **Slope.** The TLOF surface **should** be designed to promote the most rapid drainage of water from the TLOF. The slope of the TLOF **should** be no greater than 2% in any direction.

21. **Surface.** The surface of a TLOF **should** be constructed without characteristics that would adversely affect the safety of the helicopter operating from the TLOF.

22. Where the TLOF is within the FATO, the TLOF **should** be dynamic load-bearing.

23. Where a TLOF is collocated with a helicopter stand, the TLOF **should** be static load-bearing and capable of withstanding the traffic of helicopters that the area is intended to serve.

**Guidance
Material
3531(3)**

Permanent Helicopter Landing Site - Touchdown and Lift Off area

24. For runway-type FATOs, additional TLOFs located in the FATO are acceptable.

Civil Equivalence.

25. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

**Regulation
3531(4)**

Permanent Helicopter Landing Site - Safety Area

3531(4) HoEs and ADH Facing organizations **shall** ensure that a FATO is surrounded by a Safety Area.

**Acceptable
Means of
Compliance
3531(4)**

Permanent Helicopter Landing Site - Safety Area

26. **Dimension.** For Visual Meteorological Conditions operations, the Safety Area **should** extend outwards from the periphery of the FATO for a distance of at least 3m or 0.2D, whichever is greater, of the largest helicopter the FATO is intended to serve and:

a. Each external side of the Safety Area **should** be at least 2D where the FATO is quadrilateral; or

b. The outer diameter of the Safety Area **should** be at least 2D where the FATO is circular.

Acceptable Means of Compliance 3531(4)

27. For Instrument Meteorological Conditions operations, the Safety Area **should** extend at least:
- 45m either side of the FATO centre-line; and
 - 60m beyond the FATO ends.
28. **Slope.** The surface of the Safety Area, when solid, **should** have an upward slope no greater than 4% outwards from the edge of the FATO.
29. **Surface.** Where applicable, the surface of the Safety Area **should** be treated to prevent flying debris caused by rotor downwash.
30. When solid, the surface of the Safety Area abutting the FATO **should** be continuous with the FATO and capable of supporting the design helicopter without structural damage.

Guidance Material 3531(4)

Permanent Helicopter Landing Site - Safety Area

31. The surface of the Safety Area need not be solid.
- Civil Equivalence.**
32. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

Regulation 3531(5)

Permanent Helicopter Landing Site - Ground Taxiway

- 3531(5) HoEs and ADH Facing organizations **shall** ensure that, where required, a helicopter Ground Taxiway is provided to cater for the largest helicopter intended for use at the HLS.

Acceptable Means of Compliance 3531(5)

Permanent Helicopter Landing Site - Ground Taxiway

33. **Location.** For simultaneous operations, helicopter Ground Taxiway **should not** overlap.
34. Minimum separation distances between helicopter Ground Taxiways and other taxiways, objects and helicopter stands **should** be as per Table 2.

Table 2. Separation Distances (expressed in multiples of maximum design helicopter overall dimension with rotors turning)

Facility	Helicopter Ground Taxiway ^a	Air Taxiway ^a	Object ^b	Helicopter Stand ^{cdefg}
Helicopter Ground Taxiway	2	3	1.25	1.75
Air Taxiway	3	3	1.5	2.5
Object	1.25	1.5	-	1.25 (1.5)
Helicopter Stand ^{cd}	1.75	2.5	1.25 (1.5)	1.5 (1.75)

^a Centre-line to centre-line

^b Centre-line to edge of object

^c Centre-line to centre

^d Stands with through ground taxi access. Figures in () for through hover taxi access

^e Simultaneous hover operations in/out of stands are equivalent to 2 x Air Taxiway operations

^f Stands may require increased spacing to that shown to allow for manoeuvring of helicopters on the stands, either because there isn't through access or because there is a need to manoeuvre helicopters to park them headed into wind.

^g Stands without through access, no part of the turning helicopter to overlap the adjacent stand clearance and helicopter to come to rest parked centrally pointing perpendicular to the line of the stands.

35. **Dimension.** The width of a helicopter Ground Taxiway **should** be no less than 1.5 times the largest Undercarriage Width (UCW) of the helicopters the helicopter Ground Taxiway is intended to serve.
36. Horizontal helicopter Ground Taxiway curves **should** be compatible with the design helicopter and with a centre-line radius of no less than 20m.

**Acceptable
Means of
Compliance
3531(5)**

37. Helicopter Ground Taxiway intersection edge fillet radii **should** be no less than 10m.
38. A helicopter Ground Taxiway **should** extend symmetrically on each side of the centre-line for at least 0.75 times the largest overall width of the helicopters it is intended to serve.
39. **Longitudinal slope.** The longitudinal slope of a helicopter Ground Taxiway **should** be no greater than 3%, to allow for stabilized and safe use of the taxiway by a helicopter.
40. **Transverse slope.** The transverse slopes of a Ground Taxiway **should** be sufficient to prevent the accumulation of water on the surface of the taxiway but **should** be no greater than 2% to promote the most rapid drainage of water from the taxiway.
41. **Surface.** A helicopter Ground Taxiway **should** be static load-bearing and capable of withstanding the traffic of the helicopters the helicopter Ground Taxiway is intended to serve.
42. The surface of a helicopter Ground Taxiway **should** be resistant to the effect of rotor downwash.
43. Shoulders **should** extend symmetrically on each side of the Ground Taxiway and to a width 0.5 x maximum design helicopter overall dimension.
44. The longitudinal slope on a helicopter Ground Taxiway shoulder **should** be no greater than 3%.
45. The transverse slope on a helicopter Ground Taxiway shoulder **should** be no greater than 2%.
46. The shoulder of a helicopter Ground Taxiway **should** be resistant to the effect of rotor downwash.

**Guidance
Material
3531(5)**

Permanent Helicopter Landing Site - Ground Taxiway

47. When a taxiway is intended for use by Air Systems and helicopters, the provisions for taxiways for Air Systems and helicopter Ground Taxiways are to be taken into consideration and the more stringent requirements are to be applied.

Civil Equivalence.

48. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

**Regulation
3531(6)**

Permanent Helicopter Landing Site - Air Taxiway

3531(6) HoEs and ADH Facing organizations **shall** ensure that, where required, a helicopter Air Taxiway is provided to cater for the largest helicopter intended for use at the HLS.

**Acceptable
Means of
Compliance
3531(6)**

Permanent Helicopter Landing Site - Air Taxiway

49. **Location.** Minimum separation distances between helicopter Air Taxiways and other taxiways, objects and helicopter stands **should** be as per Table 2.
50. **Dimension.** The width of a helicopter Air Taxiway **should** be at least two times the largest UCW of the helicopters that the helicopter Air Taxiway is intended to serve.
51. A helicopter Air Taxiway **should** extend symmetrically on each side of the centre-line for a distance at least equal to the largest overall width of the helicopters it is intended to serve.
52. **Slope.** The slopes of the surface of a helicopter Air Taxiway **should not** exceed the slope landing limitation of the helicopters the Air Taxiway is intended to serve.
53. The slopes of a helicopter Air Taxiway **should** be within design helicopter parameters and no more than 7% longitudinally and 10% transversely.
54. **Surface.** The surface of a helicopter Air Taxiway **should**:

**Acceptable
Means of
Compliance
3531(6)**

- a. Be rotor down-wash resistant;
- b. Be suitable for emergency landing (static load bearing); and
- c. Provide ground effect.

**Guidance
Material
3531(6)**

**Permanent Helicopter Landing Site - Air Taxiway
Civil Equivalence.**

55. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

**Regulation
3531(7)**

Permanent Helicopter Landing Site - Air Transit Route - Design

- 3531(7) HoEs and ADH Facing organizations **shall** ensure that Air Transit Routes are selected that allow Autorotative/One Engine Inoperative landings whilst minimising injury or damage to property.

**Acceptable
Means of
Compliance
3531(7)**

Permanent Helicopter Landing Site - Air Transit Route - Design

56. For day operations, the width of the Air Transit Route **should** be no less than 7 times the design helicopter radius.
57. For night operations, the width of the Air Transit Route **should** be no less than 10 times the design helicopter radius.
58. Centre-line direction changes of an Air Transit Route **should** be no more than 120°.
59. Centre-line turn radii of an Air Transit Route **should** be no more than 270m.

**Guidance
Material
3531(7)**

Permanent Helicopter Landing Site - Air Transit Route - Design

60. Nil.

**Regulation
3531(8)**

Permanent Helicopter Landing Site - Apron - Location

- 3531(8) HoEs and ADH Facing organizations **shall** ensure that HLS Aprons are located such that operations do not adversely impact other aerodrome users.

**Acceptable
Means of
Compliance
3531(8)**

Permanent Helicopter Landing Site - Apron- Location

61. **Location.** Minimum separation distances between helicopter aprons, helicopter taxiways, objects and helicopter stands **should** be as per Table 2.
62. **Dimension.** A helicopter stand intended to be used by helicopters turning in a hover **should** be of sufficient size to contain a circle of diameter of at least 1.2D of the largest helicopter the stand is intended to serve.
63. Where a helicopter stand is intended to be used for taxi-through and where the helicopter using the stand is not required to turn, the minimum width of the stand and associated protection area **should** be that of the taxi-route.
64. Where a helicopter stand is intended to be used for turning, the minimum dimension of the stand and protection area **should** be not less than 2D.
65. Where a helicopter stand is intended to be used for turning, it **should** be surrounded by a protection area which extends for a distance of 0.4D from the edge of the helicopter stand.
66. **Slope.** The transverse slopes of an apron **should** be sufficient to prevent the accumulation of water on the surface of the apron but **should** be no greater than 2%.

**Acceptable
Means of
Compliance
3531(8)**

67. **Surface.** A helicopter stand and associated protection area intended to be used for air taxiing **should** provide ground effect.
68. The central zone of a helicopter stand **should** be capable of withstanding the traffic of helicopters it is intended to serve and **should** have a static load-bearing area:
- Of diameter not less than 0.83D of the largest helicopter it is intended to serve; or
 - For a helicopter stand intended to be used for taxi-through, and where the helicopter using the stand is not required to turn, the same width as the helicopter Ground Taxiway.

**Guidance
Material
3531(8)**

Permanent Helicopter Landing Site - Apron- Location

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

Civil Equivalence.

70. This regulation is in line with ICAO Annex 14 Vol II para 3.1.

**Regulation
3531(9)**

Domestic Helicopter Landing Site

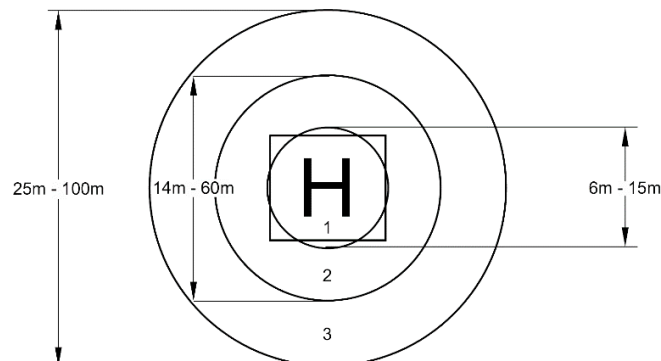
- 3531(9) HoE and ADH Facing organizations **shall** ensure that, where required, a domestic HLS is constructed according to the requirements of the helicopters intended to use the HLS.

**Acceptable
Means of
Compliance
3531(9)**

Domestic Helicopter Landing Site - Dimension

71. **Dimension.** The size of a domestic HLS **should** be in accordance with the maximum and minimum dimensions given in Figure 1.

Figure 1 Maximum and Minimum Sizes for Domestic HLS



Circle 1 = Hard surface (0.83D).

Circle 2 = Cleared to ground level (1D).

Circle 3 = Free of obstructions over 25cm high (2D).

Note: The circles are not to be marked; only the 'H' and its surrounding box are to be marked in white paint.

72. The size of a domestic HLS **should** be determined according to the largest overall dimension of the helicopter using the HLS (D).
73. In the absence of definite information on the type of helicopter to be operated, units **should** choose the largest site.
74. **Slope.** The ground of a HLS **should** be level, however, where a slope is present, it **should** be uniform and:
- For day only operations, **should not** exceed 7°; and
 - For day and night operations **should not** exceed:

**Acceptable
Means of
Compliance
3531(9)**

- (1) 0° nose down;
- (2) 3° nose up; and
- (3) 3° laterally

75. **Surface.** The surface of the centre of the site **should** be even and sufficiently firm to allow a fully loaded ground vehicle (0.25 ton for light helicopters, 3 tons for heavy helicopters) to stop and start without sinking.

76. The landing point surface **should** be concrete/asphalt for a Group 3 HLS;

77. The whole landing site **should** be cleared of loose materials or piles of dust/sand, which could be blown up by the rotor blades.

78. Landing sites with sandy or dusty surfaces **should** be stabilised or covered by an approved material.

79. Snow and ice **should** be removed from the landing site.

**Guidance
Material
3531(9)****Domestic Helicopter Landing Site - Dimension**

80. Larger dimensions than those provided may be appropriate depending on factors such as the size of the load to be lifted etc.