**Airspace Risk Analysis for Heliports: Draft**

**Definition of a Heliports Imaginary Surfaces found in CFR Part-77**

**§77.23   Heliport imaginary surfaces.**

**(a) *Primary surface.*** The area of the primary surface coincides in size and shape with the designated take-off and landing area. This surface is a horizontal plane at the elevation of the established heliport elevation.

**(b) Approach surface***.* The approach surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports and 10 to 1 for military heliports.

**(c) *Transitional surfaces.*** These surfaces extend outward and upward from the lateral boundaries of the primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

**LAYER-1:**

**CFR Part-77**

**§77.9 Construction or alteration requiring notice.**

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of:

(a) Any construction or alteration that is more than 200 ft. AGL at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

(d) Any construction or alteration on any of the following airports and heliports:

(1) A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications;

(2) A military airport under construction, or an airport under construction that will be available for public use;

(3) An airport operated by a Federal agency or the DOD.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

(e) You do not need to file notice for construction or alteration of:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation;

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

(3) Any construction or alteration for which notice is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

**FAA Heliport Design Advisory Circular AC 150/5390-2C**

**Definitions**

**n. Hazard to air navigation.** Any object having a substantial adverse effect upon the safe and efficient use of the navigable airspace by aircraft, upon the operation of air navigation facilities, or upon existing or planned airport/heliport capacity as determined by the FAA.

**cc. Obstruction to air navigation.** Any fixed or mobile object, including a parked helicopter, of greater height than any of the heights or surfaces presented in subpart C of part 77 (see also paragraph 111 in this AC).

**kk. Shielded obstruction.** A proposed or existing obstruction that does not need to be marked or lighted due to its close proximity to another obstruction whose highest point is at the same or higher elevation.

**uu. Unshielded obstruction.** A proposed or existing obstruction that may need to be marked or lighted since it is not near another marked and lighted obstruction whose highest point is at the same or higher elevation.

**111. Hazards to air navigation.** Part 77 establishes requirements for notification to the FAA of objects that may affect navigable airspace. It sets standards for determining obstructions to navigable airspace and provides for aeronautical studies of such obstructions to determine their effect on the safe and efficient use of airspace. Part 77 applies only to public airports and heliports, airports operated by a federal agency or the Department of Defense, and private airports and heliports with at least one FAA-approved instrument approach procedure. See Figure 1–4.

**a. FAA studies.**

**(1) Part 77.** Part 77 defines objects that are obstructions to surfaces. Presume these objects to be hazards unless an FAA study determines otherwise. The FAA conducts aeronautical studies to determine the physical and electromagnetic effect on the use of navigable airspace, air navigational facilities, public airports and heliports, and private airports and heliports with at least one FAA-approved instrument approach procedure. The FAA encourages public agencies to enact zoning ordinances to prevent man-made features from becoming hazards to navigation.

**(2) Part 157.** While the FAA performs aeronautical studies under part 157 (see paragraph 110.c), such studies do not identify hazards to private facilities that do not have an FAA-approved instrument approach.

**b. Mitigation of hazards.** You may mitigate the adverse effect of an object presumed or determined to be a hazard by:

**(1)** Removing the object.

**(2)** Altering the object, for example, reducing its height.

**(3)** Marking and/or lighting the object, provided an FAA aeronautical study has determined that the object would not be a hazard to air navigation if it were marked and/or lighted. Find guidance on marking and lighting objects in AC 70/7460-1, Obstruction Marking and Lighting.

**c. Notification requirements.** Part 77 requires persons proposing certain construction or alteration to give 45-day notice to the FAA of their intent. Use FAA Form 7460-1, Notice of Proposed Construction or Alteration to provide notification. See https://oeaaa.faa.gov for more information and to download the form.



**LAYER 2:**

**217. Marking and lighting of difficult-to-see objects.** It is difficult for a pilot to see unmarked wires, antennas, poles, cell towers, and similar objects, even in the best daylight weather, in time to take evasive action. While pilots can avoid such objects during en route operations by flying well above them, approaches and departures require operations near the ground where obstacles may be a factor. This paragraph discusses the marking and lighting of objects near, but outside and below the approach/departure surface. Find guidance on marking and lighting objects in AC 70/7460-1, Obstruction Marking and Lighting.

**a. Airspace.** If difficult-to-see objects penetrate the applicable object identification surfaces illustrated in Figure 2–32 and Figure 2–33, mark these objects to make them more conspicuous. If a heliport supports operations between dusk and dawn, light these difficult-to-see objects. The object identification surfaces in Figure 2–32 and Figure 2–33 are described as follows:

**(1)** In all directions from the safety area except under the approach/departure paths, the object identification surface starts at the safety area perimeter and extends out horizontally for a distance of 100 feet (30.5 m).

**(2)** Under the approach/departure surface, the object identification surface starts from the outside edge of the FATO and extends horizontally out for a distance of 800 feet (244 m) along the approach path. From this point, the object identification surface extends out for an additional distance of 3,200 feet (975 m) along the approach path while rising on an 8:1 slope (8 units horizontal in 1 unit vertical). From the point 800 feet (244 m) from the FATO perimeter, the object identification surface is 100 feet (30.5 m) beneath the approach/departure surface.

**(3)** The width of this object identification surface under the approach/departure surface increases as a function of distance from the safety area. From the safety area perimeter, the object identification surface extends laterally to a point 100 feet (30.5 m) outside the safety area perimeter. At the upper end of the surface, the object identification surface extends laterally 200 feet (61 m) on either side of the approach/departure path.

**b. Shielding of objects.** Title 14 CFR Part 77.9, Construction or alteration requiring notice, provides that if there are a number of objects close together, it may not be necessary to mark all of them if they are shielded. To meet the shielding guidelines, part 77 requires that an object “be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation.”



**LAYER 3:**

