

Chapter 10 - Airspace Obstructions

Introduction

An airspace obstruction can be an object created by man, whether existing or planned, permanent or temporary, and can also be natural growth on terrain. Obstructions to air navigation are presumed to be hazards to air navigation until a Federal Aviation Administration (FAA) study determines otherwise. **The airport sponsor or applicant requesting a study has the burden of proving the object is not a hazard.** Federal Aviation Regulation (FAR) Part 77, states that an object is an obstruction if it is higher than any of the following:

- A height of 500 feet above ground level at the site of the object.
- A height of 200 feet above ground level or above the established airport elevation, whichever is higher; within 3 nautical miles of the established airport reference point (mathematically calculated center of the airport), excluding heliports, with its longest runway more than 3,200 feet in actual length. That height increases 100 feet for each *additional* nautical mile of distance from the airport up to a maximum of 500 feet.
- A height that is within the terminal obstacle clearance area which results in the vertical distance between any point on that object, and an established minimum instrument flight altitude within that area, being less than what is the required obstacle clearance.
- A height within an en route obstacle clearance area of a Federal airway or approved airway route, which would make the minimum obstacle clearance altitude increase.
- A height that would penetrate any imaginary surfaces associated with a public use airport (civil airport), military airport or heliport.

Obstructions and airport imaginary surfaces are detailed, defined and discussed in FAR Part 77, "Objects Effecting Navigable Airspace."

Notice Of Construction Or Alteration

In administering FAR Part 77, the prime objective of the FAA is to ensure the safety of aircraft and the efficient use of navigable airspace by aircraft. The FAA recognizes that there are varied demands for the use of airspace, both by aviation and non-aviation interests. When conflicts arise out of construction proposals, the FAA emphasizes the need for conserving the navigable airspace.

Early notice of proposed construction or alteration provides the FAA the opportunity to:

- Evaluate the effect of the construction or alteration on operational procedures and proposed operational procedures.
- Determine if the proposed construction or alteration has any possibly hazardous effects on air navigation.
- Give recommendations for marking and lighting the construction or alteration in accordance with all FAA regulations.
- To update charting and other Notifications To Airmen of the construction or alteration.
- To determine any other appropriate measures to be instituted for continued safety of air navigation.

Construction Or Alteration Requiring Notices (FAA Form 7460-1)

All projects involving construction on or near airports, are required to submit the **FAA Form 7460-1, "Notice of Proposed Construction or Alteration"**, located **on the enclosed CD**, to the FAA Regional Air Traffic Division if the proposed construction or alteration falls into any of the following categories:

1. As a general rule, any activity on an airport should be submitted, as well as any crane or tower work in the vicinity of an airport.
2. The proposed construction or alteration would be more than 200 feet in height above ground level at its site near an airport.
3. Located on any of the following airports (including heliports):
 - A public use airport that is listed in the Airport Directory of the current Airman's Information Manual.
 - An airport under construction, that is planned or proposed and that will be available for public use.
 - An airport that is operated by any armed forces of the United States.
4. When any construction or alteration is within 20,000 feet of the airport reference point of an airport (as described above in number 3) that has at least one runway longer than 3,200 feet. The object would be higher than a 100:1 horizontal slope (meaning 100 feet horizontally for each 1 foot vertically) approach zone from the nearest point, of the nearest runway, excluding heliports.

5. When any construction or alteration is within 10,000 feet of the reference point of an airport (as described previously in number 3) not having any runway more than 3,200 feet in length and the object would be higher than a 50:1 horizontal slope (meaning 50 feet horizontally for each 1 foot vertically) approach zone from the nearest point of the nearest runway, excluding heliports.
6. When any construction or alteration is within 5,000 feet of the reference point of a heliport (as described previously in number 3), and the object is higher than a 25:1 horizontal slope (meaning 25 feet horizontally for each 1 foot vertically) approach zone from the nearest landing and takeoff area of that heliport.
7. When there is proposed construction or alteration to any of the following:
 - Any interstate highway, including the imaginary space that extends 17 feet above that highway (to allow for the height of any moving vehicles or other objects), which would make the highway and its imaginary space penetrate the approach zones described above (numbers 1-6).
 - Any other public roadway, including the imaginary space that extends 15 feet above that roadway (to allow for the height of any moving vehicles or other objects), which would make the public roadway and its imaginary space penetrate the approach zones described above (numbers 1-6).
 - Any private road, including the imaginary space that extends 10 feet above that roadway or the height of the highest mobile object that would normally cross the roadway, which would make the private road and its imaginary space penetrate the approach zones described above (numbers 1-6).
 - Any railroad, waterway, or any other thoroughfare not mentioned, including the imaginary space that extends 23 feet above those thoroughfares or the height of the highest mobile object that would normally cross them, which would make these thoroughfares and their imaginary spaces penetrate the approach zones described above (numbers 1-6).

The LA DOTD Aviation Section has sponsored a program called the Photoslope process where designated runway approach surfaces are photographed in order to identify objects which penetrate these approach surfaces as defined by FAR Part 77. Through the use of these photographs, the Photoslope process documents the status of runway approach surfaces. The format of the photography allows the airport manager and state and federal inspectors to visualize the approach, identify existing obstructions, and anticipate potential obstructions.

All photographic documentation can be stored for immediate access through a PC based computer system (IBM Compatible). If you want more information about the Photoslope program, contact the Division of Aviation.

Construction Or Alteration Not Requiring Notice

The sponsor is not required to notify the FAA for any of the following construction or alteration:

- Any object that would be shielded by any permanent existing structures or by any natural terrain that is of equal or greater height.
- Any antenna structure 20 feet or less in height except if it increases the height of another antenna structure.
- Any FAA approved air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device that has a fixed location and height.
- Any construction or alteration for which notification is required by any other FAA regulation.

Filing Notices

Each sponsor who proposes construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously) shall send one executed set (four copies) of the FAA Form 7460-1, "Notice of Proposed Construction or Alteration" to the following address:

**DOT/FAA
Airports Division, ASW-640
Fort Worth, Texas 76193-0640
Tel: (817) 222-5640 Fax: (817) 222-5988
<http://www.faa.gov/arp/asw>**

A copy must also be sent to the LADOTD, Division of Aviation at the following address:

**LADOTD
Division of Aviation
P. O. Box 94245
Baton Rouge, Louisiana 70804-9245
Tel: (225) 274-4125 Fax: (225) 274-4181
http://www.dotd.louisiana.gov/section_home.asp?SEC=88**

This notice must be submitted at least 30 days prior to the date of construction or alteration, or 30 days prior to the date the construction permit is applied for, whichever is sooner. The application is usually filed by the owner of the object that will undergo the construction or alteration.

If the project is subject to Federal Communications Commission (FCC) licensing requirements such as constructing or altering communication towers, the FAA must be notified on or before the date of filing with the FCC. In the case of an emergency involving essential public services, where public safety or health is a concern, telephone notification is acceptable if the FAA is also notified in writing within 5 days.

Any proposed structure or alteration to an existing structure that is higher than 2,000 feet above the ground will be presumed to be a hazard to air navigation and results in inefficient use of airspace, unless proven otherwise by the sponsor.

Additional Notices

Each sponsor who *proposes* construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously) may be notified by the FAA that a supplemental notice is required. In this case, the sponsor must submit a FAA Form 117-1, “Notice of Progress of Construction or Alteration”, to the FAA regional office at least 48 hours prior to the start of the construction or alteration.

Also, each sponsor who *begins* construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously), must submit a FAA Form 117-1 to the FAA regional office within 5 days after the construction or alteration reaches its greatest height if the construction or alteration is more than 200 feet in height above ground level at its site, or if the FAA states that the submission of this form is required.

Acknowledgment Of Notices

The FAA will return, in writing, an acknowledgment stating they have received the FAA Form 7460-1. The FAA will indicate that the construction or alteration proposed either: would not exceed any standard previously described and would not be an obstruction to air navigation; would exceed a standard described previously but would not be a hazard to air navigation; or would exceed a standard described previously and further study is necessary to determine if it would be a hazard to air navigation. Until any further study has been completed, the proposed construction or alteration would be presumed to be a hazard to air navigation.

The FAA may sometimes request a complete airspace study. This airspace study mainly consists of comments from all applicable governing agencies, including local, state and federal agencies.

Once complete, a “Determination of Hazard to Air Navigation” or a “Determination of No Hazard to Air Navigation” is issued. Structures that receive the “hazard” designation may still be constructed unless the structure needs licensing or permitting from the FCC. The FCC will not issue permits and licenses to owners of structures deemed by the FAA as being “hazards to air navigation.”

Persons failing to comply with the provisions of FAR Part 77 may be subject to a criminal penalty under Section 902 of the Federal Aviation Act of 1958, as amended.

Obstruction Marking And Lighting

The FAA may recommend that a structure be marked and/or lighted to warn pilots. The following sections discuss some aspects of marking and lighting objects. For all marking and lighting standards, please refer to the FAA Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting" for additional information.

Marking

Marking structures is used to identify obstacles during daylight hours in order to warn pilots of the obstructions. This is accomplished by painting the structure or by using suitable markers. Two colors of paint are used in marking: orange (Aviation Orange Federal Standard Number 12197) and white (Aviation White Federal Standard Number 17875). These colors should conform to the Federal Standard FED-STD-595 for chromaticity and luminance. With the heat and rain conditions that are prevalent in Louisiana, all structures should be repainted when showing signs of deterioration, usually often.

Various types of paint patterns are used to mark structures. The pattern used depends upon the size and shape of the structure. The different types of paint patterns are illustrated in **Figure 10.1** and are described below:

Solid Pattern: Structures that have both horizontal and vertical dimensions that are less than 10.5 feet should be colored a solid aviation orange.

Checkerboard Pattern: Large structures that are more than 10.5 feet across and have a horizontal dimension that is equal to or greater than the vertical dimension (such as storage tanks), should be colored with alternating rectangles of aviation orange and aviation white. The sides of the checkerboard rectangles should measure not less than 5 feet or more than 20 feet. For more information and for some exceptions, please refer to the standards established in AC 70/7460-1G "Obstruction Marking and Lighting".

Alternating Color Bands: Large structures that are more than 10.5 feet or more across and have the vertical dimension that is larger than the horizontal dimension (such as communication towers, smokestacks, poles, skeletal framework of storage tanks, etc.), should be marked with alternating bands of aviation orange and aviation white. The width of the bands will depend upon the width and height of the structure. For more information please refer to the standards established in Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting".

Teardrop Pattern: Circular shaped water storage tanks that have a single circular standpipe support may be marked in teardrop striped pattern. The tank should be colored to show alternating stripes of aviation orange and aviation white. The stripes should extend from the top center of the tank to its supporting standpipe. The width of the stripes should be equal and the width of each stripe at the greatest girth of the tank should not be less than 5 feet nor more than 15 feet.

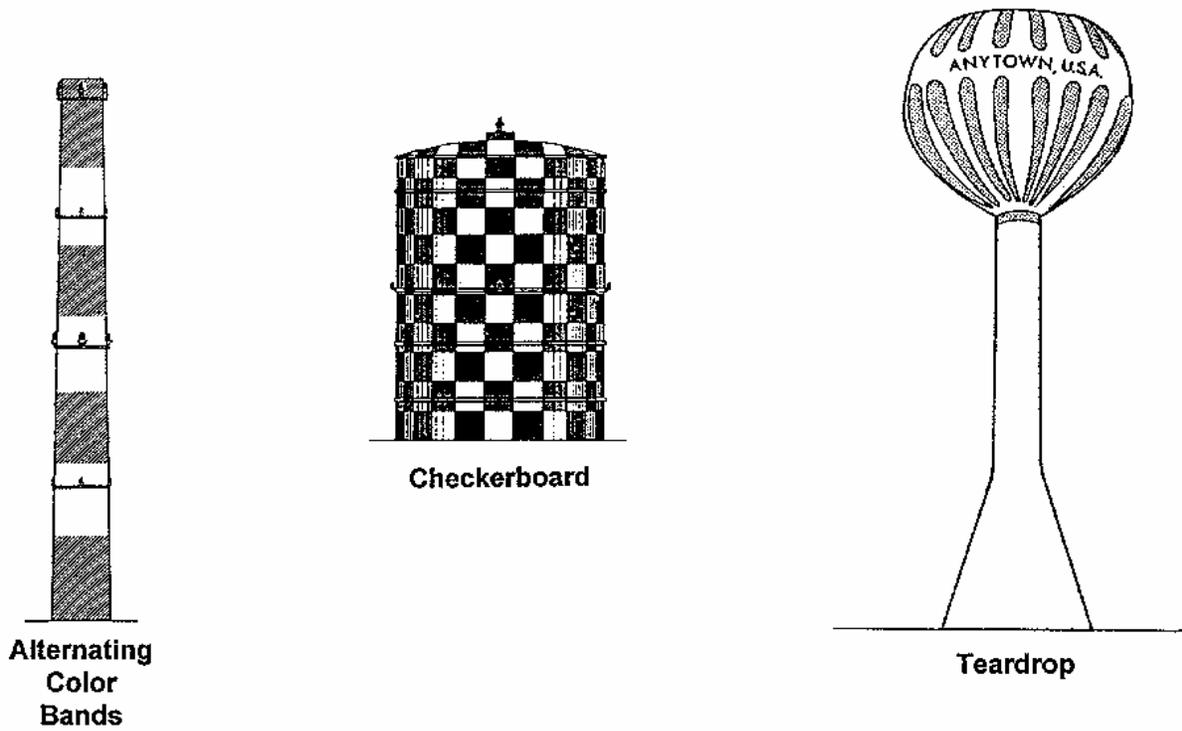


Figure 10.1: Various Structure Marking Patterns

Markers should be used when painting an object is not practical. Ball markers are usually used on overhead lines. All ball markers should not be less than 36 inches in diameter when these lines cross long distances, such as over rivers. Small 20-inch diameter ball markers may be used on lines that cover shorter distances, that are below 50 feet above the ground or are within 1,500 feet of the runway end. Depending on the length, these ball markers should be spaced equally across these lines but not exceeding 200 feet apart. Alternating colors of aviation orange, white, and yellow should be used to provide the greatest visibility of these ball markers. When less than four balls are used, they should all be aviation orange.

Flag markers may be used to mark certain obstructions when painting or ball markers are technically impractical. Temporary construction equipment, cranes, derricks, oil drilling rigs are some examples. The flags should be placed at the highest point of a structure. An aviation orange flag of not less than 2 feet square is recommended but, a checkerboard pattern of aviation orange and aviation white is also frequently used. Flag stiffeners should be used to keep it from drooping in calm wind.

Lighting

Lighting structures is a method used to identify obstacles at night in order to warn pilots of the obstructions.

Obstruction lighting may be displayed in any of the following combinations:

Aviation Red Obstruction Lights: This method is the minimum lighting system which uses flashing aviation red beacons and steady burning aviation red lights during the nighttime. Aviation orange and aviation white paint should be used for daytime marking.

High Intensity White Obstruction: This method uses flashing high intensity white obstruction lights during the daytime and automatically reduced intensity for twilight and nighttime operation. An FAA aeronautical study will be conducted to determine if this system is recommended to make the structure more visible. When this type of system is used, other methods of marking and lighting the structure may be omitted. This system is not recommended on structures 500 feet tall or less unless an FAA aeronautical study shows otherwise.

Medium Intensity White Obstruction Lights: During daytime medium intensity white obstruction lights with control for intensity change for darkness may be used. When this type of system is used on structures 500 feet tall or less, other methods of marking and lighting the structure may be omitted. Aviation orange and aviation white paint should be used for daytime marking on structures over 500 feet tall. This system should not be used on structures less than 200 feet in height unless an FAA aeronautical study shows otherwise.

For more information on obstruction lighting standards and other combinations of lighting systems, please refer to the standards established in Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting".

Terminal Instrument Procedures (TERPs)

The United States Standard for Terminal Instrument Procedures (TERPs) contains criteria which are used to establish procedures for instrument approaches and departures of aircraft to and from civil and military airports. These criteria are to be used at any airport where an appropriate United States Agency exercises jurisdiction.

The FAA establishes and approves terminal instrument procedures for civil airports. At civil airports, the owner/operator can make request to the FAA for procedures. The FAA will grant requests for an instrument approach procedure and/or instrument departure procedure if the following minimum standards are met:

Airport

- Runways must have adequate landing surfaces for the expected aircraft using the procedures.
- These runways must be marked and lighted as specified in the FAA's "United States Standard for Terminal Instrument Procedures".
- The airport must pass an FAA airport airspace analysis conducted in accordance with the FAA Handbook 7400.2B "Procedures for Handling Airspace Matters".

Navigational Facility

- All electronic and visual navigation facilities used must successfully pass flight inspection.

Obstacle Marking and Lighting

- Obstacles which penetrate FAR Part 77 imaginary surfaces should be marked and lighted in accordance with the FAA Advisory Circular AC 70/7460.1G "Obstruction Marking and Lighting".

Weather Information

- Terminal weather observation and reporting facilities must be available for the airport to serve information on an alternate airport.

Communications

- Air-to-ground communications must be available at the initial approach fix minimum altitude and when the aircraft performing the missed approach reaches the missed approach altitude. At lower altitudes communications shall be required wherever it is essential to the safe and efficient use of the airspace.

For more information on TERPs and the requirements to establish them, please refer to the Federal Aviation Administration's "United States Standard for Terminal Instrument Procedures".

References

Federal Aviation Administration, "United States Standard for Terminal Instrument Procedures".

Federal Aviation Regulation Part 77, "Objects Affecting Navigable Airspace"

Federal Aviation Administration Advisory Circular 70/7460-1K, “Obstruction Marking and Lighting”

Federal Aviation Administration Advisory Circular 70/7460-2K “Obstruction Marking and Lighting”

Federal Aviation Administration Advisory Circular 150/5020-1, “Noise Control and Compatibility Planning for Airports”

Federal Aviation Administration Advisory Circular 150/5050-4, “Citizen Participation in Airport Planning”

Federal Aviation Administration Advisory Circular 150/5070-6B, “Airport Master Plans”

Federal Aviation Administration Advisory Circular 150/5070-7, “The Airport System Planning Process”

Federal Aviation Administration Advisory Circular 150/5190-4A, “A Model Zoning Ordinance to Limit Height of Objects Around Airports”

Federal Aviation Administration Advisory Circular 150/5200-32A, “Reporting Wildlife Aircraft Strikes”

Federal Aviation Administration Advisory Circular 150/5200-33A, “Hazardous Wildlife Attractions on or near Airports”

Federal Aviation Administration Advisory Circular 150/5200-34A, “Construction or Establishment of Landfills Near Public Airports”

Federal Aviation Administration Advisory Circular 150/5300-13, “Airport Design”

Federal Aviation Administration Advisory Circular 150/5300-16, “General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-17, “General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-18, “General Guidance and Specifications for Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards”

Federal Aviation Administration Advisory Circular 150/5320-14, “Airport Landscaping for Noise Control Purposes”