

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SW 5200.5B

SOUTHWEST REGION

2/15/96

SUBJ: AIRPORT SAFETY DURING FAA-FUNDED AIRPORT CONSTRUCTION AND FAA FACILITIES MAINTENANCE

1. **PURPOSE.** This Order establishes airport safety standards for FAA-funded construction (Airport Improvement Program and Facilities and Equipment Program) and FAA facilities maintenance.
2. **DISTRIBUTION.** This Order is distributed to the Section level in the Airports and Airway Facilities Divisions, to the Branch level in the Flight Standards, Air Traffic, and Civil Aviation Security Divisions, to the Fort Worth Flight Procedures Office, to all Southwest Region field offices and facilities, and to F & E Field Installation/Construction Representatives.
3. **CANCELLATION.** Order SW 5200.5A, Airport Safety During FAA-Funded Airport Construction and FAA Facilities Maintenance, dated 6/6/89, is canceled.
4. **EXPLANATION OF CHANGES.** This Order revises and updates safety criteria for consistency with current FAA publications and updates references to regional organizations.
5. **DEFINITIONS.**
 - a. **Airport Elevation** - the highest point on the landing surface of an airport.
 - b. **Certificated Airport** - an airport which, by law, is safety-regulated by the FAA under Part 139 of the Federal Aviation Regulations, and which operates under specific safety requirements which apply to maintenance and construction activities on the airport. Certificated airports are listed in Appendix 2.
 - c. **Displaced Threshold** - A threshold that is located at a point on the runway other than the designated beginning of the runway. A temporary displacement may be used

Distribution: A-X-3(FS,AT,AP,CS); A-X-4(AF);
A-FOF-0 (maximum); A-FAF-10; A-FAS-1

Initiated By: ASW-620

to provide landing aircraft adequate clearance over construction equipment or other objects in the approach area of a runway or adjacent to a runway.

d. **Obstacle Free Zone (OFZ)** - an FAA airport design standard for a volume of airspace above a runway. The components are the Runway OFZ, Inner-transitional surface OFZ, and Inner-Approach OFZ.

e. **Obstruction** - any structure, natural growth, vehicle or construction material which penetrates any airport imaginary surface defined by FAR Part 77, including primary, transitional, approach, horizontal, and conical surfaces.

f. **Relocated Threshold** - a runway end which is not located at the physical end of the pavement. This may occur if part of a runway is closed, and a relocated threshold is established at the beginning of the usable pavement. (Note: this term is not used in the Notice to Airmen system.)

g. **Safety Area** - the ground surface next to runways, taxiways, and aircraft parking areas which is expected to be graded, drained and free of any hazardous surface variations and nonfrangible objects, the purpose of which is to reduce the risk of damage to an aircraft inadvertently leaving airport pavement.

h. **Small Aircraft** - an aircraft weighing 12,500 lbs or less maximum certificated takeoff weight.

i. **Large Aircraft** - an aircraft weighing more than 12,500 lbs. maximum certificated takeoff weight.

6. **PROCEDURES.** Aviation safety is a primary consideration during airport construction and facilities maintenance. These activities shall be planned and scheduled to minimize disruption of normal aircraft ground and air traffic. For airports subject to FAR Part 107, Airport Security, the airport operator's security program standards shall be observed in the areas of access control, and movement and identification of construction and FAA personnel and vehicles.

a. These standards shall be used to develop specific safety measures which FAA employees, grantees, and contractors shall adhere to during these activities on all airports in the Southwest Region. They provide a reasonable level of safety, but aircraft operations, weather, security, or local airport rules may require use of more stringent safety measures. Use of less stringent measures and changes that impact security controls are permitted only after coordination between Airports, Air Traffic, Airway Facilities, Flight Standards, and Civil Aviation Security Divisions, airport management, and affected aviation users.

b. Bid documents for on-airport construction or maintenance projects shall include general and specific safety requirements, based on Appendix 1 to this Order, so that contractors are aware of the costs and constraints which will apply during the project to maintain a high level of aviation safety.

c. If the clearances and restrictions described in this Order cannot be maintained while construction or maintenance is underway, action will be taken as appropriate to:

- (1) close runways, taxiways, or aprons,
- (2) relocate or displace runway thresholds temporarily,
- (3) perform work at night or during periods of minimal aircraft activity,
- (4) close affected areas to certain types of aircraft,
- (5) restrict aircraft use by weight, wingspan, approach speed, or other characteristic,
- (6) shut down or restrict use of navigational or approach aids.

d. FAA employees who are responsible for construction or maintenance activities on airports shall coordinate project safety and security requirements and impacts with the airport sponsor as soon as the impacts have been identified, but before commitments are made with contractors or others to perform work on an airport. Coordination will vary from formal predesign conferences to informal contacts with the airport manager or responsible sponsor official before starting work.

7. SAFETY IMPACTS. Potentially hazardous conditions which may occur during airport construction and maintenance include the following:

- a. **Excavations, trenches, and stockpiled material on or near runways, taxiways and aprons.**
- b. **Construction equipment on aircraft operating areas or in runway approaches or departure areas.**
- c. **Inadequate construction area marking or lighting.**
- d. **Lack of control over vehicle access to aircraft operating areas, unauthorized entry of personnel, vehicles, or animals.**
- e. **Inadequate vehicle marking or lighting.**
- f. **Deficient marking and lighting of temporary runway thresholds.**

g. **Failure to issue, update, or cancel Notices to Airmen concerning airport or runway closures or other construction-related airport condition.**

h. **Failure to mark and identify utilities or power cables, resulting in loss of airport lighting; navigational, visual, or approach aids; weather reporting service; or communications.**

i. **Unauthorized vehicle operations in localizer or glide slope critical areas, resulting in electronic interference or facility shutdown.**

j. **Construction debris (gravel, sand, mud, paving material, etc.) on airport pavements, resulting in aircraft prop, turbine engine, or tire damage.**

k. **Exposed pavement edges (drop-offs) from runways, taxiways and aprons to adjacent pavement sections or shoulders.**

l. **Construction activities which hamper aircraft rescue/ firefighting access from fire stations to the runway-taxiway system or airport buildings.**

m. **Lack of radio communication with construction and maintenance vehicles in aircraft operating areas.**

8. **SAFETY STANDARDS.** Paragraphs a through h below define safety standards and guidelines for FAA-funded construction and FAA maintenance activities on airports.

a. **Obstacle Free Zone**

(1) Objects, vehicle, and stockpiled material normally are not permitted to penetrate an OFZ. OFZs are shown on Figures 1 - 4.

(a) Runway OFZs are applicable at any time the runway is open for aircraft use. On precision runways with approach lights, the inner-approach and inner-transitional surface OFZs must be kept free of penetrations only when the weather conditions are below an 800 ft. ceiling or less than 2 miles visibility and aircraft are using an Instrument Landing System (ILS) for approaches.

(b) Objects which do not penetrate an OFZ still may require notice to the FAA under FAR Parts 77 or 152 and may be obstructions to air navigation. Those objects which exceed FAR Part 77 obstruction standards are to be appropriately obstruction-marked and, if used at night, obstruction-lighted. Cranes or other equipment of unusual height may require special consideration and coordination with FAA operating Divisions and airport users.

(2) The Runway OFZ is a volume of airspace extending from the runway surface up to 150 feet above the runway. It extends 200 feet beyond each end of the runway and has the following width:

Runways Serving:	Visibility Minimums lower than 3/4 mile	Other Runways
Small Aircraft	300 feet	250 feet
Large Aircraft	400 feet	

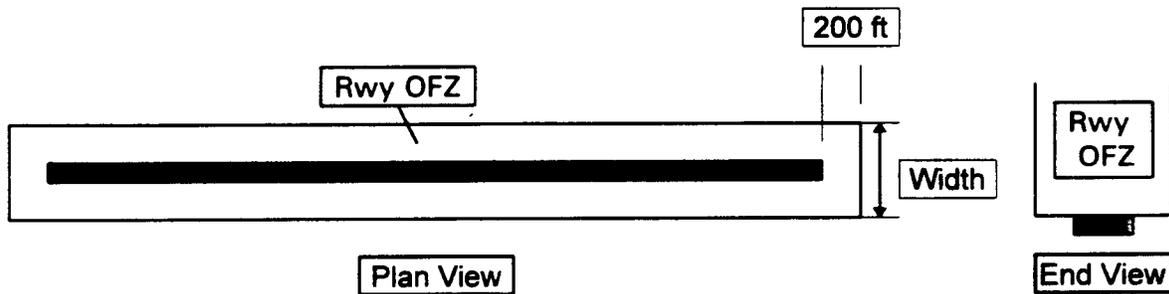


Figure 1

OFZ - Visual Runways and Runways with visibility minimums not lower than 3/4 mile

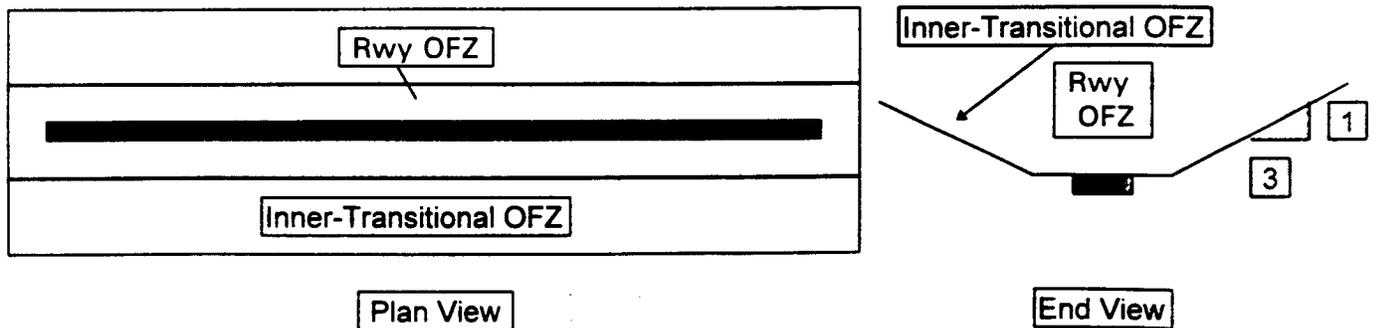


Figure 2

OFZ - Small airplanes exclusively with visibility minimums lower than 3/4 mile

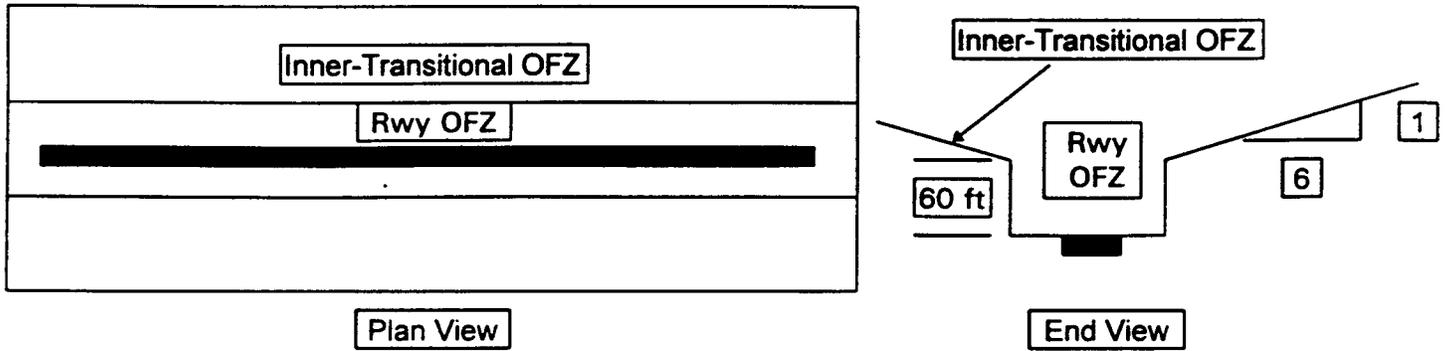


Figure 3. OFZ - Runways serving large aircraft - visibility minimums lower than 3/4 mile

(3) The Inner-Approach OFZ, shown in Figure 4, applies only to runways with approach lighting systems. It begins 200 feet from the runway threshold and ends 200 feet beyond the last light unit in an approach lighting system, and has a 50:1 slope, beginning at runway end elevation.

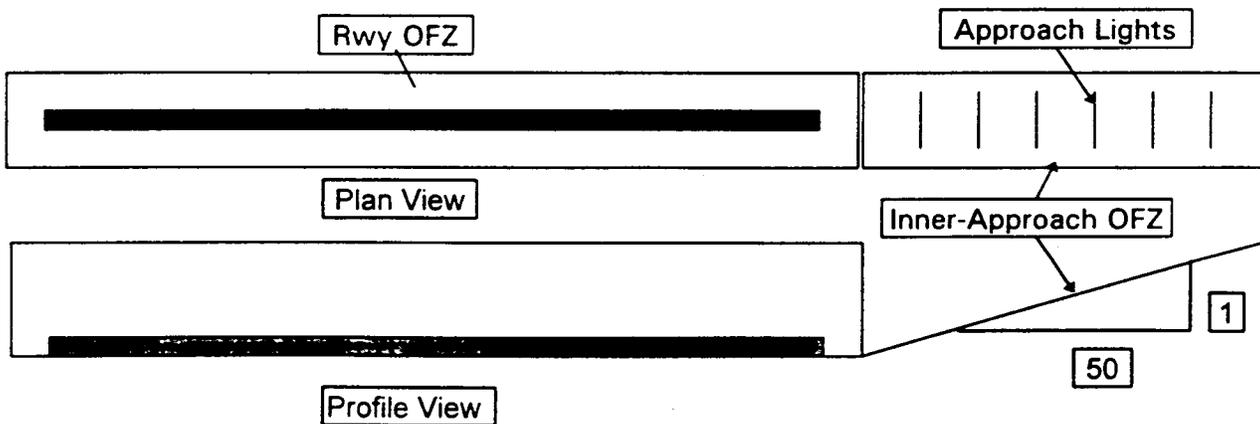
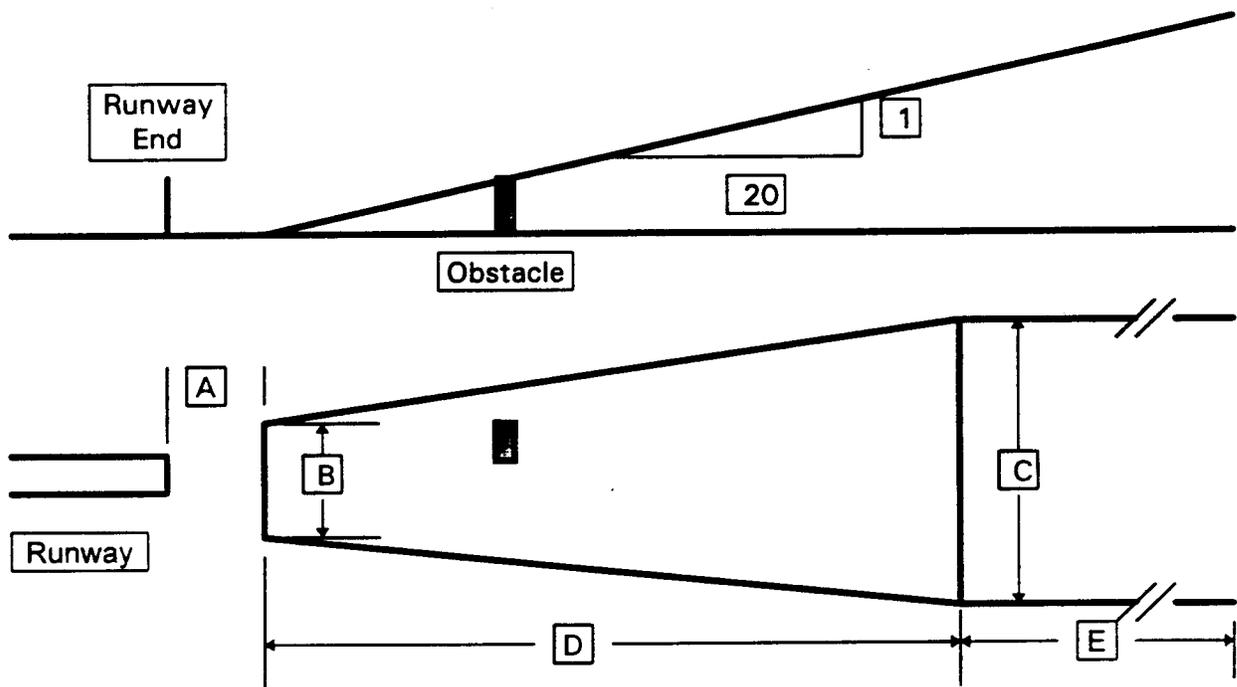


Figure 4. Inner-Approach OFZ - Runways with approach lighting systems

b. Approach Clearance Over Equipment and Material.

(1) Construction activity in a runway approach may result in a need to displace the landing threshold temporarily. If an object penetrates a surface shown in Fig. 5, displace the threshold to a point where the surface is not penetrated.

(2) Objects which do not penetrate these surfaces still may be obstructions to air navigation and/or may affect standard instrument approach procedures. Coordinate these with the Fort Worth Flight Procedures Office, and the Air Traffic System Management Branch, ASW-530, as necessary.



Dimension (Feet)	Small Aircraft	Large Aircraft
A	0	200
B	250	400
C	700	1000
D	2250	1500
E	2750	8500

Figure 5. 20:1 Threshold Location Surface

c. Partial Runway Closure For Equipment On The Runway.

(1) When equipment of construction/maintenance activity must be on a runway and a decision is made to keep part of the runway open for aircraft, part of the runway must be closed as shown in Figure 6. The dimensions shown are recommended; however, a larger closed area than shown may be necessary depending on aircraft use, level of activity, pilot technique, and equipment height, and a smaller closed area may be possible under some circumstances. These recommendations are based on equipment heights of about 15 feet; higher objects may require special considerations.

(2) Use the following distances from the construction/maintenance activity to the relocated threshold:

Small aircraft (12,500 lbs or less) - 500 feet
 Large aircraft (More than 12,500 lbs.) - 1000 feet

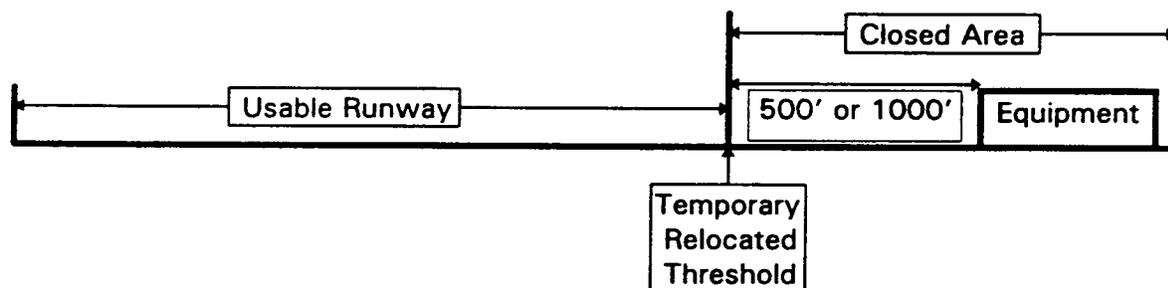
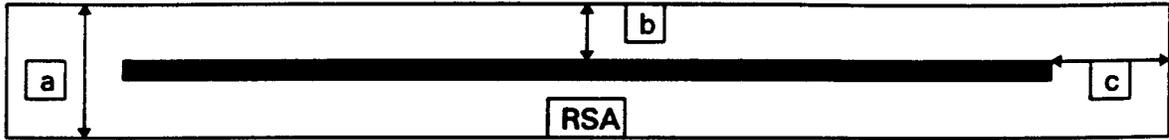


Figure 6. Relocated Threshold for Equipment on the Runway

d. Runway and Taxiway Safety Areas.

(1) Runway safety areas - construction or maintenance activity is prohibited in runway safety areas (RSA) while the full length of the runway is open. Normal FAA maintenance of visual, approach, and navigational aids is permissible within safety areas provided vehicles, material, and excavations do not penetrate a runway OFZ and requirements of paragraph 8b for approach clearance over vehicles, equipment and material are met.

(2) Runway safety area dimensions are shown in Figure 7. Existing safety areas at a particular airport may be larger or smaller than the standard dimensions listed. If construction or maintenance activity must take place within the specified safety area, it is also acceptable to restrict the runway use to a smaller size of aircraft and use a narrower and/or shorter safety area dimension for the duration of the activity.



Aircraft Approach Category	Runway Safety Area Dimensions (Feet)					
	Airplane Design Group (See Appendix 3)					
A and B		I	II	III	IV	
visual runways and not lower than 3/4 mi approach visibility minimums	Dimen. a	120	150	300	500	
	b	30	40	100	175	
	c	240	300	600	1000	
lower than 3/4 mi approach visibility minimums	a	300	300	400	500	
	b	100	100	150	175	
	c	600	600	800	1000	
C and D		I	II	III	IV	V
	a			All 500		
	b			All 150		
	c			All 1000		

Note 1: Use dimension a or b, whichever results in the greater distance from the runway centerline.

Note 2: Use dimension c or the existing safety area length, whichever is less, but no less than 200 feet.

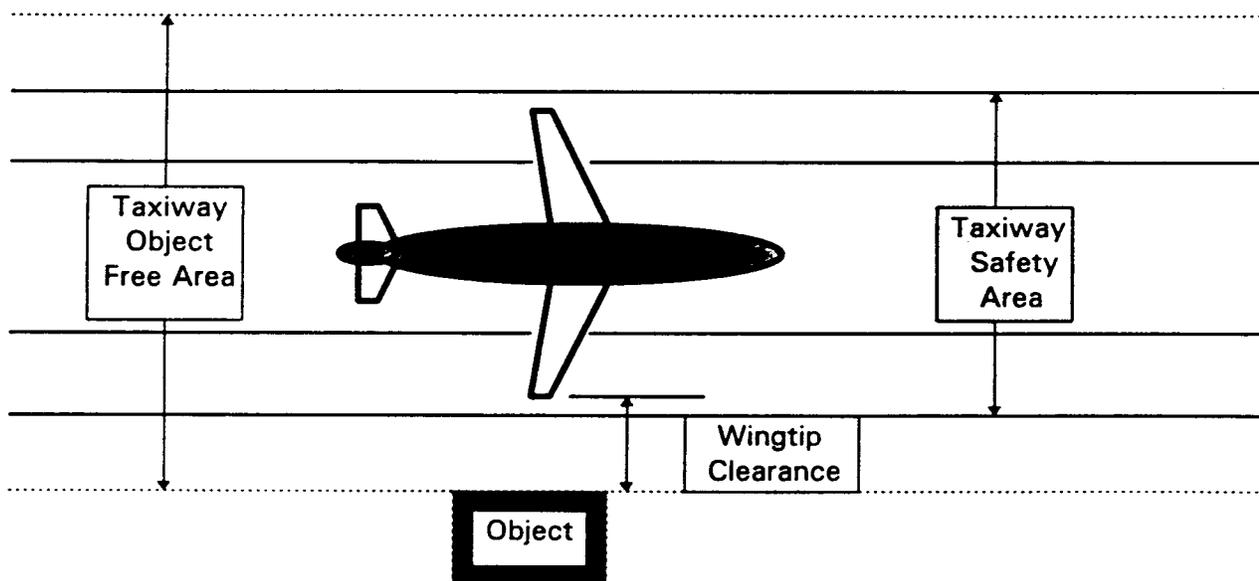
Note 3: Some certificated airports have or permit use of 400-foot wide runway safety areas during construction and maintenance. Coordinate proposals with the Airports Division, Safety and Standards Branch, ASW-620.

Figure 7. Runway Safety Areas

(3) Taxiway safety areas/object free areas - see Figure 8.

Construction/maintenance activity is permissible in taxiway object free areas and safety areas if the activity is hazard-marked and/or lighted and NOTAMs are in effect. Special consideration must be given to the height of barricades, flashers and other warning devices to clear aircraft wingtips, propellers, engines etc. Other actions may be necessary such as:

- Using "wingwalkers" to guide aircraft past hazards,
- Using temporary taxiway marking/lighting to detour aircraft clear of the area,
- Moving equipment and personnel well clear to allow aircraft to pass safely.



Airplane Design Group (See Appendix 3)					
Item	I	II	III	IV	V
Taxiway Safety Area Width (Feet)	49	79	118	171	214
Taxiway Object Free Area Width (Feet)	88	130	186	260	320

Figure 8. Taxiway Safety Area and Object Free Area

e. Marking and Lighting**(1) Temporary displaced runway threshold:**

(a) Mark with white arrows and a white threshold bar as shown in Advisory Circular 150/5340-1, or

(b) Use alternate marking which is:

- 1 Clearly visible to the pilot,**
- 2 Not misleading, confusing, or deceptive,**
- 3 Secured in place to prevent movement,**
- 4 Made of material which will minimize damage to aircraft which come in contact with the marking.**

(2) Temporary relocated runway threshold (partial closure of a runway):

(a) Mark with yellow chevrons as shown in A.C. 150/5340-1, or use alternate marking as described in par. (1)(b) above.

(b) Runway distance remaining signs may need to be covered or removed during the closure to avoid misleading runway length indications to pilots.

(3) Temporary runway thresholds must be lighted if all or part of a runway is to be open at night during construction and maintenance. The airport operator may already have temporary threshold lighting available, but this should be determined in advance.

(a) Use light lens colors and spacing in A.C. 150/5340-24, Runway and Taxiway Edge Lighting System.

(b) Disable runway lighting on closed parts of runways and adjust amber lenses (caution zone) if necessary. On some lighting systems, it may be necessary to cover a light rather than removing the lamp or fixture.

(c) Disable visual glide slope indicators (VASI, PAPI, PLASI, etc.), REIL, and approach lights which would otherwise give misleading indications to pilots as to the threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance for pilots on approach to the affected runway. These may be funded or provided by the FAA or the sponsor.

(4) Closed runway marking:

(a) Use yellow "X" marking as shown in A.C. 150/5340-1.

(b) Closed runway marking is not required on airports with 24-hour Control Towers if the closed runway cannot be mistaken by pilots for nearby open runways and the airport operator consents to omitting them. In some cases, closed runway marking could interfere with the use of the runway for aircraft taxiing if this is to be allowed while the runway is closed for landing and takeoffs.

(c) Closed runway marking is not required on runways which are closed only at night provided that:

1 Runway lighting and visual aids are turned off,

2 NOTAMs are in effect regarding the closure.

(5) Hazard Marking (barricades, traffic cones, flashers, etc.) shall be used:

(a) To outline construction/maintenance areas which are accessible to aircraft, persons, or vehicles,

(b) To identify isolated hazards such as open manholes, small areas under repair, stockpiled material, waste areas, etc.,

(c) To prevent aircraft from taxiing onto a closed runway for takeoff,

(d) To identify FAA, airport, and National Weather Service facilities, cables, power lines, ILS critical areas and other sensitive areas, in order to prevent damage, interference, and facility shutdown.

f. Navigation Aids and Instrument Approach Procedures

(1) The need to shut down navigational, approach, or visual aids shall be determined on a case-by-case basis. Flight Standards, Air Traffic, Airports, Airway Facilities, the Flight Procedures Office, and the airport sponsor shall be involved in the decision as necessary. Work within an ILS critical area may affect the radiated signals and interfere with aircraft navigation. ILS critical areas may be shown on the Airport Layout Plan, or contact the local Airway Facilities office or Airport Traffic Control Tower for information on critical area location and dimensions.

(2) Construction on or near runways may severely restrict the use of Standard Instrument Approach Procedures, and all phases of the project shall be coordinated with the Fort Worth Flight Procedures Office to determine the effects.

g. Notices to Airmen (NOTAM)

(1) Responsibility for issuing NOTAMs shall be determined before construction or maintenance begins. Refer to Order 7930.1, National Notice to Airmen System, or Advisory Circular 150/5200-28, Notices to Airmen for Airport Operators.

(2) NOTAMs on shutdown or irregular operation of FAA-owned facilities shall be issued and canceled only by FAA employees. Flight Data Center (FDC) NOTAMs on instrument approach procedures are issued by the Fort Worth Flight Procedures Office. NOTAMs on airport conditions and non-Federal navigational aids shall be issued and canceled only by the airport sponsor. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate shall notify the responsible person.

h. Vehicle Identification. FAA employees who operate vehicles on an airport shall comply with the airport owner's rules for vehicle marking, lighting, and operations, unless FAA requirements are more stringent. Vehicles operated by FAA employees on active runways, taxiways, or safety areas shall be marked with orange and white flags or flashing yellow beacons during daylight hours, and with flashing yellow beacons at night. Contractors and suppliers shall be informed of the applicable requirements of the airport sponsor by the FAA or airport sponsor employee responsible for the work.

i. Controlling Access To Aircraft Operational Areas

(1) Vehicle and pedestrian access routes for airport construction and maintenance shall be controlled as necessary to prevent inadvertent or unauthorized entry of persons, vehicles, and animals. The amount of construction traffic or local security/safety rules may require use of personnel to control access through gates or fencing, or across aircraft movement areas. Radio communications may be required between these personnel and a Control Tower if equipment and personnel must enter or cross an active Aircraft Movement Area.

(2) Vehicle parking areas for FAA and contractor employees shall be designated in advance to minimize vehicle traffic in aircraft operating areas while still providing reasonable employee access to the job site.

9. STANDARD SAFETY SPECIFICATIONS. General safety provisions which apply during contract work on airports are contained in the following documents:

a. Facilities and Equipment Program (F & E) projects - Additional General Provisions, FAA P-1, Clause No. 75, "Special Precautions for Work at Operating Airports."

b. Airport Improvement Program (AIP) projects - Advisory Circular 150/5370-10, "Standards for Specifying Construction of Airports," General Provisions 40-05, Maintenance of Traffic; 70-08, Barricades, Warning Signs, and Hazard Marking; 80-04, Limitation of Operations.

10. PROJECT SPECIFICATIONS. Specific safety requirements for a project may be developed using the guide in Appendix 1 of this Order, or may be written or provided in other forms which provide similar guidance. The project safety requirements shall be included in the plans and specifications, as applicable, when an invitation for bids is issued.



Clyde M. DeHart, Jr.
Regional Administrator