

**AIRPORT STANDARDS DIRECTIVE 403  
[ASD 403]**

**MARKING OF OBSTACLES**



**AIRPORTS STANDARDS DIVISION  
DEPARTMENT OF CIVIL AVIATION MALAYSIA**

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# AMENDMENT RECORD

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## INTRODUCTION

1. The Civil Aviation Act 1969 has made provisions for the control and the denoting of obstacles to ensure air navigation could be conducted safely.
2. Airport Standards Directive 401 [ASD401] defines objects regarded as obstacles. Where it is impractical to eliminate an obstacle, it shall be appropriately marked and/or lighted so as to be clearly visible to pilots in all weather and visibility conditions.
3. This Directive outlines the application of provisions under the Act in the form of rules, instructions and practices pertaining to the marking of obstacles and to which aerodrome operator, local authority, developer or property owner shall be informed and obliged to comply.
4. This Directive has been written in general terms. Specific advice could be obtained from the Authority at:

Department of Civil Aviation  
Airport Standards Division  
Level 1 Block Podium B 4G4 Precinct 4  
Federal Government Administration Offices  
62570 PUTRAJAYA.  
Phone: 03-88714000  
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## OBJECTIVE

5. This Directive specifies the characteristics of obstacle markings to be used in indicating the various obstacles defined in ASD401.

## MARKING OF OBSTACLE

6. Objects defined as obstacles in ASD 401 shall be marked.
7. Markings may be omitted -
  - i. where the obstacle is shielded by another fixed obstacle; or
  - ii. where the obstacle is lighted with Obstacle Lights as defined under Para 28 of this Directive.

## AUTHORITY

8. The Authority is the Department of Civil Aviation Malaysia.

## USE OF COLOURS

### 9. Single Colour

- 9.1 An obstacle shall be coloured in a single conspicuous colour if its projection on any vertical plane has both dimensions less than 1.5 meters.
- 9.2 Orange or red shall be used.
- 9.3 Against some background it may be necessary to use different colour from Orange or Red to obtain sufficient contrast.

### 10. Chequered Pattern

- 10.1 An obstacle shall be coloured to show a chequered pattern if it has essentially unbroken surfaces and its projection on any vertical plane equals or exceeds 4.5 meters in both dimensions.
- 10.2 The pattern shall consist of rectangles of not less than 1.5 meters and not more than 3 meters on a side and the corners being of the darker colour.
- 10.3 The colours of the pattern shall contrast each with the other and with the background against which they will be seen.
- 10.4 Orange and White or Red and White shall be used.
- 10.5 Against some background it may be necessary to use different colour from Orange and White or Red and White to obtain sufficient contrast.

### 11. Vertical Contrasting Bands

- 11.1 An obstacle shall be coloured to show vertical contrasting bands if it has essentially unbroken surfaces and its projection on the horizontal plane is more than 4.5 meters and its projection on the vertical plane is less than 1.5 meters.
- 11.2 The contrasting bands shall be perpendicular to the horizontal plane and have a width approximately  $\frac{1}{7}$  of the horizontal dimension or 30 meters, whichever is less.

11.3 The band widths shall be determined in reference to the following Table.

Horizontal Dimension		Band Widths
Greater than [meters]	Not exceeding [meters]	
4.5	210	1/7 of the Horizontal Dimension
210	270	1/9 of the Horizontal Dimension
270	330	1/11 of the Horizontal Dimension
330	350	1/13 of the Horizontal Dimension
350	450	1/15 of the Horizontal Dimension
450	510	1/17 of the Horizontal Dimension
510	570	1/19 of the Horizontal Dimension
570	630	1/21 of the Horizontal Dimension

11.4 The number of bands shall be odd with the both the outer-most band to be of the darker colour.

11.5 The colours of the pattern shall contrast each with the other and with the background against which they will be seen.

11.6 Orange and White or Red and White shall be used.

11.7 Against some background it may be necessary to use different colour from Orange and White or Red and White to obtain sufficient contrast.

## 12. Horizontal Contrasting Bands

12.1 An obstacle shall be coloured to show horizontal contrasting bands if –

(a) it has essentially unbroken surfaces and its projection on the vertical plane is more than 4.5 meters and its projection on the horizontal plane is less than 1.5 meters; or

(b) it is of skeletal type with either the vertical dimension or horizontal dimension is greater than 1.5 meters.

12.2 The contrasting bands shall be perpendicular to the vertical plane and have a width approximately 1/7 of the horizontal dimension or 30 meters, whichever is less.

12.3 The band widths shall be determined in reference to the following Table.

---

Vertical Dimension		Band Widths
Greater than [meters]	Not exceeding [meters]	
1.5	210	1/7 of the Vertical Dimension
210	270	1/9 of the Vertical Dimension
270	330	1/11 of the Vertical Dimension
330	350	1/13 of the Vertical Dimension
350	450	1/15 of the Vertical Dimension
450	510	1/17 of the Vertical Dimension
510	570	1/19 of the Vertical Dimension
570	630	1/21 of the Vertical Dimension

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12.4 The number of bands shall be odd with the both the top-most and bottom-most band to be of the darker colour.

12.5 The colours of the pattern shall contrast each with the other and with the background against which they will be seen.

12.6 Orange and White or Red and White shall be used.

12.7 Against some background it may be necessary to use different colour from Orange and White or Red and White to obtain sufficient contrast.

### 13. Emergency Vehicles

13.1 An emergency vehicle shall be marked with a single conspicuous colour of either red or yellowish green.

### 14. Service Vehicles

14.1 A service vehicle shall be marked with a single conspicuous colour yellow.



## USE OF MARKERS

15. Markers displayed on or adjacent to obstacles shall be located in conspicuous position so as to retain the general definition of the obstacle and shall be recognizable in clear weather from a distance of at least 1000 meters for an obstacle to be viewed from the air and 300 meters for an obstacle to be viewed from the ground in all direction in which the aircraft is likely to approach the obstacle.
16. The shape of the marker shall be distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information and they shall be such that the hazard presented by the obstacle they mark is not increased.
17. Spherical markers shall be displayed on overhead wires and cables.
18. Spherical markers shall have a diameter of not less than 60 cm.
19. The spacing between two consecutive spherical markers or between a spherical marker and a supporting tower shall be appropriate to the diameter of the spherical marker, but in no case shall the spacing exceed –
  - i. 30 meters where the spherical marker diameter is 60 cm.
  - ii. 35 meters where the spherical marker diameter is 80 cm.
  - iii. 40 meters where the spherical marker diameter is 130 cm.
20. The colours of the flags shall contrast with the background against which they will be seen.
21. The spherical marker shall be of one colour and when installed should be displayed alternately Red and White or Orange and White spherical markers.

## **USE OF FLAGS**

22. Flags used to mark obstacles shall be displayed around, on top of or at the highest edge of the obstacle.
23. Flags used to mark extensive obstacles or groups of closely space obstacles shall be displayed at least every 15 meters.
24. Flags used to mark obstacles shall not increase the hazard presented by the obstacle they mark is not increased.
25. Fixed obstacles
  - 25.1 Flags used to mark fixed obstacles shall not be less than 0.6 meter square.
  - 25.2 Flags used to mark fixed obstacles shall be Orange in colour or a combination of two triangular sections, Orange and White or Red and White.
26. Mobile obstacles
  - 26.1 Flags used to mark mobile obstacles shall not be less than 0.9 meter square.
  - 26.2 Flags used to mark mobile obstacles shall consist of a chequered pattern, each having sides of not less than 0.3 meters with colours Orange and White or Red and White to be used.
27. The colours of the flags shall contrast with the background against which they will be seen.

## **OMISSION OF MARKINGS BY THE LIGHTING OF OBSTACLES**

28. Markings for an obstacle may be omitted by the lighting of the obstacle with Obstacle Lights, as follows -
  - i. when the obstacle is lighted by DCA/M/A by day
  - ii. when the obstacle is lighted by DCA/H/A by day
  - iii. when the obstacle is lighted by DCA/H/B by day for towers supporting wires or cables

## **DEVIATIONS**

29. The Department of Civil Aviation shall notify and publish deviations from any Standards and Recommended Practices contained in ICAO Annex 14 in the Aeronautical Information Services publications in compliance to the Article 38 of the Convention on International Civil Aviation.

30. The Appendices to this Directive shall be taken, construed, read and be part of this Directive.

**DATO' AZHARUDDIN ABDUL RAHMAN**  
**Director General**  
**Department of Civil Aviation**  
**Malaysia**

**Dated: 1 November 2008**

