

**OFFICE OF THE CHAIRMAN, AIRPORTS AUTHORITY OF INDIA**

**DIRECTORATE OF AIR TRAFFIC MANAGEMENT**  
**DARA CIRCULAR NO. 05 OF 2005.**

(SECTION-AR I OPERATIONS)

NO.AAI.20012/1/05-ARI ( NOC )

PRINCIPLES GOVERNING THE ISSUE OF NO OBJECTION CERTIFICATE FOR CONSTRUCTION OF BUILDING AND OTHER STRUCTURE IN THE VICINITY OF AERODROMES.

\*\*\*\*\*

Before issue of "NOC" for a Building, Mast or any other structure in the vicinity of an aerodrome, it is required to be examined with a view to ascertain that this object is not likely to cause an obstruction from the point of view of safety of aircraft operations in all respects, i.e., Aerodrome & Ground Aids (AGA), Operations and Communication points of view. The parameters which should be taken into consideration in respect of Aerodrome and Ground Aids(AGA) point of view are as follows :

**1.1 RUNWAY STRIP**

A runway and any associated stopway shall be contained in a rectangular runway strip. The dimensions of the runway strip are given in the Table below:

**DIMENSION OF BASIC STRIP**

RUNWAY		INSTRUMENT RUNWAY		NON-INSTRUMENT RUNWAY	
Code No.	Length {METRE}	Width Extending Laterally on Either Side of Runway Centre Line(Metre)	Length beyond Runway End/ Stopway (Metre)	Width Extending laterally on either side of runway Centre Line (Metre)	Length beyond Runway End/Stopway (Metre)
1.	< 800	75	60	30	30
2.	800 < 1200	75	60	40	60
3.	1200 < 1800	150	60	75	60
4.	1800 & above	150	60	75	60

**Note:**

Where there is no possibility of having a runway strip of 300mt for instrument runways, there is no point in applying that yard stick for the purpose of NOC.

## 1.2 CLEARWAY

The rectangular area beyond runway extremity extending laterally for a distance of at least 75mt on each side of the extended centre line of the runway, upto a distance not exceeding half the length of the take-off run available, provided that the land is under the control of the appropriate authority maintaining the Aerodrome.

## 1.3 TRANSITIONAL SURFACE

It is a complex surface sloping upwards and outwards upto the Inner Horizontal Surface from the edge of the Approach Surface and from a line originating at the end of the inner edge of each approach area, drawn parallel to the runway centre line in the direction of landing. Its slope shall be measured in a vertical plane perpendicular to the centre line of each runway as given below :

- 1.3.1. The outer limit of the Transitional Surface is determined by its intersection with the plane containing Inner Horizontal Surface.

In case of Instrument Runway, its slope shall be 14.3% i.e.(1:7). In case of Non-Instrument Runway, the slope shall be 20% i.e. (1:5) for runway length less than 1200 metres and 14.3% i.e. (1:7) for runway length 1200 mt and above.

## 1.4 APPROACH AREA AND SURFACE

The approach area shall be established from the smaller ends of the runway strip for each runway direction intended to be used for the landing of aeroplanes. The limits and slopes are given in the Table below :

DIMENSIONS AND SLOPES OF APPROACH SURFACES :

RUNWAY		INSTRUMENT RUNWAY [DIVERGENCE 15% ON EITHER SIDE]				NON-INSTRUMENT RWY[DIVERGENCE 10% ON EITHER SIDE]	
Code No.	Length (Metre)	First Section Length Slope (Metre)		Second Section Length Slope (Metre)		Length Slope (Metre)	
1.	< 800	3000	2.5%	3600	3%	1600	5%
2.	800<1200	3000	2.5%	3600	3%	2500	4%
3.	1200<1800	3000	2%	3600	2.5%	3000	3.33%
4.	1800 &above	3000	2%	3600	2.5%	3000	2.5%



- NOTE: 1) The permissible elevations shall be restricted to that of either Approach or Inner Horizontal Surface/Conical Surface, whichever is the lowest.  
 2) For Datum of Approach surface refer para 1.9.1.

1.5 While examining cases for the issue of "NOC the following points should be kept in view :

1.5.1 At aerodrome where there are more than one runway with overlapping approach areas and associated surface the criteria shall be as prescribed for the main runway.

1.5.2 For determining the approach area, the physical extremities of the runway shall only be considered irrespective of the fact that a runway threshold is displaced due to any reason.

1.5.3 At Aerodrome , where the proposals for runways extension exist, the requisite surface shall be determined from the proposed extended runway strip/associated clearway, as applicable.

**1.6 INNER HORIZONTAL SURFACE AREA**

1.6.1 The dimension and permissible height of Inner Horizontal Surface are given in the Table below :

DIMENSIONS AND PERMISSIBLE HEIGHTS OF INNER HORIZONTAL SURFACE

RUNWAY		INSTRUMENT RUNWAY		NON-INSTRUMENT RUNWAY	
CODE No.	LENGTH (METRE)	RADIUS (METRE)	HEIGHT (METRE)	RADIUS (METRE)	HEIGHT (METRE)
1.	< 800	3500	45	2000	45
2.	800<1200	3500	45	2500	45
3.	1200<1800	4000	45	4000	45
4.	1800 & above	4000	45	4000	45

**NOTE** For Datum of Inner Horizontal Surface refer para 1.9.2.

1.6.2 Where the runway length is 1525 mt or more, the Inner Horizontal Surface shall be a composite pattern, which consists of two circular areas centred at the two runway ends with a radius of 4000 meters. These areas shall be joined tangentially to form an elliptical shape.

1.6.3 Where it is required to protect two or more widely spaced long runways, an even more complex pattern involving four or more circular areas are formed. These areas should be joined tangentially by straight lines and the I H S shall be defined by the external limits of the resulting pattern.

1.6.4

**ADJOINING AERODROMES WITH OVERLAPPING CIRCUITS**

When two aerodromes are close to each other with overlapping circuits the I H S will be drawn as prescribed in para 1.6.2 . The inner horizontal surfaces of these two aerodromes shall be joined tangentially to form one common I H S .

1'6.5

**LANDING GROUNDS WITHOUT PAVED RUNWAYS**

For the landing ground without paved runways a clearance of 4% (1:25) from the boundary of aerodrome in all directions shall be applied upto a distance of 460mt and beyond that a uniform elevation of 45mt. Above A.R.P. elevation be permitted upto a distance of 2600 mt. A conical surface extending upwards and outwards from the edge of the area ending at 2600mt should be provided upto a distance of another 1525mt. with a slope of 5% (1:20).

1.6.6.

In case of common horizontal surface serving two aerodromes, the elevation of the I.H.S. will be of higher category of the two aerodromes.

1.6.7.

In case of complex I.H.S. for two runways at the same aerodrome, a common surface need not be worked out. However, when these surfaces overlap each other, the lower surface be regarded as overriding.

**1.7****CONICAL SURFACE**

The conical surface shall be projected upwards and outwards from the periphery of the Inner Horizontal Surface (I H S). The slope of the conical surface measured above the I H S in a vertical plane shall be 5% (1:20). The outer limits and permissible heights of the conical surface are given in the table below :

**OUTER LIMITS AND PERMISSIBLE HEIGHTS OF CONICAL SURFACE**

RUNWAY		INSTRUMENT RUNWAY		NON-INSTRUMENT RUNWay	
CODE NO.	LENGTH (METRE)	Horizontal Distance of Conical Surface Beyond I.H.S. (Metres)	Maximum Height Above I.H.S. ( Metres)	Horizontal Distance of Conical Surface Beyond I.H.S. (Metres)	Maximum Height Above I.H.S. (Metres)
1.	< 800	1200	60	700	35
2.	800<1200	2100	105	2100	105
3.	1200<1800	2100	105	2100	105
4.	1800 & above	2100	105	2100	105

For Datum of conical surface refer para 1.9.2.



**1.8 OUTER HORIZONTAL SURFACE**

- 1.8.1 The Outer Horizontal Surface(OHS) shall extend to 15000 metres from the Aerodrome Reference Point(ARP) for Aerodrome with runway code 3 and 4.
- 1.8.2 In case of Aerodomes with Runway code-2, the Outer Horizontal Surface(OHS) shall extend to 14740 metres from Aerodrome Reference Point (ARP) for Instrument runways and 13740 metres for Non-Instrument runways.
- 1.8.3 Where combined I H S is established for two Aerodrome, the OHS shall be centred on the ARP of the Aerodrome of higher category.
- 1.8.4 It is proposed not to establish Outer Horizontal Surface (OHS) Aerodrome with runway code-1.
- 1.8.5 The height of the OHS will be 150 metres above the Aerodrome Elevation. The construction protruding above these surfaces shall not be permitted. The existing obstruction should be marked.
- 1.8.6 The tall structures shall be considered to be of possible significance if they are 35 metres or more above ground level within the obstacle limitation surface and 120 metres or more above ground level outside the obstacle limitation surface.

**1.9 DATUM FOR AGA CLEARANCE**

**APPROACH SURFACES**

- 1.9.1 The elevation of the associated runway end or the elevation of the runway end after completion of the proposed extension shall be the datum.
- 1.9.2 **INNER HORIZONTAL SURFACE, CONICAL SURFACE AND OUTER HORIZONTAL SURFACE**

Aerodrome Elevation shall be considered as it's datum for Inner Horizontal Surface / Conical Surface / Outer Horizontal Surface ; elevation of ARP will be considered as datum wherever Aerodrome Elevation is not established.

**1.9.3 TRANSITIONAL SURFACE**

For transitional surface, the elevation of the point on the outer edge /of the runway strip, which is the nearest to the proposed building/ structure shall be the datum.  
For the areas in the transitional surface, which are located beyond the length of the runway strip, the elevation of the runway end nearest to which the new construction is proposed shall be the datum for determining the permissible height.

**2 SHIELDING BENEFIT FROM THE EXISTING STRUCTURES**

- 2.1 The following criteria shall be applied to determine whether a structure is shielded by an already existing obstruction or whether the benefit of shielding from an already existing obstruction should be given to a newly proposed structure.
- 2.1.1 The principle of shielding will not be applied in the transition surface area.
- 2.1.2 The principle of shielding will not be applied in the approach areas within 3000 metres of the inner edge of these areas.
- 2.1.3 The principle of shielding will not be applied in the IHS upto radius of 2500 metres from the Runway end/ARP as the case may be ..
- 2.1.4 The principle of shielding will be applied in the inner, conical and outer horizontal surfaces. In the approach areas, the principle of shielding will be applied beyond 3000 metres from the inner edge in a negative slope of 10% from the top of authorized existing buildings/structures causing obstructions when projected towards the runway and on a horizontal plane when projected away from the runway.
- 2.1.5. Tall and skeletal obstructions such as isolated towers, chimney, masts, electric pylons, telephone and power lines and poles will not provide any shielding.
- 2.1.6 The benefit of shielding will not be given w r to the building which has been constructed without obtaining NOC for height clearance and /or in violation of the NOC issued by AAI.
- 2.1.7 Clearance of the object after aeronautical study by the appropriate authority will not provide automatic shielding effect to other objects, as the aeronautical study will be specific to the object covered in particular aeronautical study.

**NOTE** : The benefit of shielding will be decided by AAI Headquarters.

- 3. Restrictions/prohibition of new constructions**, the height of which does not constitute obstruction but which is nevertheless considered hazardous to the safety of aircraft operations.
- 3.1 New construction/installation which will adversely affect the performance of radio/radar/navigational aids or which will adversely affect the published instruments approach to land procedures or which will necessitate a probable change in the published procedures, shall be restricted/prohibited as deemed fit.
- 3.2 Installation of New overhead HT/LT lines or telephone/telegraph lines shall not be permitted in the approach areas within 3000 metres of the inner edge of these areas.
- 3.3 Construction of butcheries, tanneries and Refuse dumps shall not be permitted within a radius of 10kms from the Runway ends/ARP.

**NOTE:** Incinerators could be permitted clear of approach areas.



{ 7 }

- 3.4 Factory chimneys proposed to be constructed within a radius of 8 kms. of runway ends/ARP shall not be permitted unless the owners give a written undertaking that oil-fired or electric furnaces or any other fuel which will not cause smoke-hazard will only be used.
- 3.5 A 3 metre deduction shall be made from the permissible elevation of the proposed structure falling in approach surfaces and transition surfaces in the close proximity of approach funnels. Restoration of 3 Metre will be permitted only on receiving undertaking from the applicant that this height shall be utilised for building construction including super structures of any kind, such as, Wireless/TV antennas, cooling towers, munties, lift machine rooms, overhead water tanks, etc.
- 3.6 For the buildings/structures to be constructed in the vicinity of an aerodrome, the owner shall have to give an undertaking in the prescribed proforma to the effect that he is aware of the fact that no complaints of claims against the noise, vibration, nuisance or other damage to buildings/property/individuals, caused by the regular aircraft operations from/to the aerodrome, shall be entertained by the Central Government /Airports Authority of India.
- 3.7 To have effective control over the unauthorized and haphazard constructions in the vicinity of aerodromes, it is required to have zoning plans readily available with aerodromes. These could be prepared for each aerodrome on any conveniently available map, such as Guide Map, Development Map etc. having a suitable scale.
- 4 For mobile obstructions, the following allowances shall be made
- |     |            |   |             |
|-----|------------|---|-------------|
| 4.1 | Rail Track | : | 7.62 metres |
| 4.2 | Road       | : | 5.00 metres |
5. While clearing new constructions, the criteria given below shall be observed :
- 5.1 No construction shall be permitted in respect of the following:
- a) From apron edge: within a minimum distance of 26 metres.
  - b) From taxiway centre line: within a minimum distance of 42 metres.
  - c) From aircraft stand: within a minimum distance of 36 metres.
6. The parameters which should be taken into consideration from Communication points of view are given below :
- 6.1 In an aerodrome or an ACS station, no object shall be permitted on any land within the limits specified as under :

6.2 In an aerodrome or an ACS station where :

6.2.1 **VOR/TVOR/DVOR/DME/VHF DF** –the land within 305 m radius of the facility, except shadow zone as defined below :-

- In case of DVOR , area just under counterpoise
- In case of CVOR , area within circle of radius R drawn on ground with center just below center of antenna . The radius R of the circle should be such that its circumference passes through point where extended line joining topmost point of antenna and a point on circumference of counterpoise meets the ground.

6.2.2 **Localiser--** the area bounded by following

- i) A line 305 m in the direction of approaches from localizer antenna and perpendicular to the runway.
- ii) A line 60 m from the centerline of localizer antenna on either side and parallel to the runway.
- iii) A line containing center of localizer antennas and perpendicular to the runway.
- iv) Area within a circle of 75 m radius with centre at middle of the antenna system.

6.2.3 **Glide Path** –area bounded by the following:-

- i) A line 460 metres in the direction of the approach from the glide path facility and perpendicular to the runway.
- ii) A line containing glide path antenna and perpendicular of runway.
- iii) Near edge of the runway from the glide path.
- iv) A line 30 m in the directions away from the runway and parallel to it.

6.2.4 **Marker Beacons** — the land within a radius of 30 m from the center of the antenna of marker beacon.

6.2.5 **Microwave Link** – on a corridor of 30 m on either side of the direct line of azimuth and 10 m below from the direct line of sight in the vertical plane.

6.2.6 **UHF Link** – on a corridor of 30 m on either side of the direct line of azimuth and 10 m below from the direct line of sight in the vertical plane.

6.2.7 **Radio Beacon** – within a radius of 30 m for power upto 100 watts beacon and 100 m for power more than 100 watts beacon around the antenna.



- 6.3 In an aerodrome or ACS Station on the area beyond as described in 6.2.1 to 6.2.7, an object may be permitted subject to the following limits :-
- 6.3.1. **VOR/TVOR/DVOR/DME/VHF DF:** An area beyond 305 metres radius of the facility, an object should not protrude an angle of elevation of 1.2 degrees at counterpoise level.
- 6.3.2 ILS**
- 6.3.2.1 **Localiser :** Beyond the area specified in sub para 6.2.2 above, and within  $\pm 10$  degrees azimuth in front of antenna , an object should not subtend an angle of elevation of more than 0.75 degrees at centre of antenna array.
- 6.3.2.2 Beyond the area specified in sub para 6.2.2 and from  $\pm 10$  degrees to  $\pm 35$  degrees azimuth in front of antenna, an object should not subtend an angle of elevation more than 1.1 degree at antenna array.
- 6.3.2.3 **Glide Path :** Beyond the area specified in sub-para 6.2.3 above and within  $\pm 8$  degrees azimuth in front of the glide path antenna , a building/structure should not subtend an angle of elevation of more than 1.1 degree at antenna base .
- 6.3.3 **ASR :** No structure will be permitted above the level of 3 m below the pedestal height upto a distance of 500 m and beyond 500 m should not subtend an angle of elevation more than 0.5 degree or an angle equal to antenna tilt angle set during flight inspection whichever is higher, at the antenna pedestal.
- 6.3.4 **ARSR/SSR :** No structure will be permitted above the level of 5 m below the pedestal height upto a distance of 200 m , and beyond 200 m should not subtend an angle of elevation more than 0.5 degree or an angle equal to antenna tilt angle set during flight inspection whichever is higher, at the antenna pedestal.
- 6.3.5 **Extended Range VHF :** From the lowest antenna element the elevation angle permitted is 0.5 degree in the line of sight ( 10 degrees on either side of the desired direction.)
- 6.3.6 No structure will be permitted to protrude above the plane inclined at elevation angle of 2 degrees from the horizontal surface drawn at the level of antenna of INLUS and INRES of GAGAN system part of GNSS (Global Navigation Satellite System)
- 7 Based on Operational Criteria: The heights of structures shall be restricted with reference to the Obstacle Clearance Altitudes as published in Notices to Airmen and amended from time to time. The vertical clearance between the structure and the aircraft making an instrument approach to land shall be upto 150 metres.

**8. Applicability:**

These principles are applicable in respect of the aerodromes as given below;

- a) All aerodromes controlled by AAI.
- b) All licensed aerodromes.
- c) Aerodromes owned by the Defence Services of India listed in the current Flight Information Publication issued by the Air Headquarters.
- d) All State Govt. aerodromes published in the AIP/relevant AIC.
- e) All aerodromes of the above categories under construction or planned.
- f) Greenfield Airports / Joint Venture Airports.

**NOTE:**

- i) In case of the Defence Services Aerodromes, only those sites which are located outside their boundaries, shall be examined for comments.
- ii) The planned aerodrome is an aerodrome, which has been included in the current or the next plan.
- iii) For application of these rules, only those private aerodromes shall be considered for which an application has been filed with DGCA for issue of a license.

**9. To have the effective control over the construction activities of the Government or private agencies within the areas specified for obstacle limitation surfaces, all Aerodrome Officers/Officers-in-Charge of aerodromes are enjoined to exercise continuous vigilance over such activities. They are to take immediate action to bring any violation of the laid down criteria to the notice of Local Administrative Authorities for stoppage of such construction activities and also keep Headquarters informed in this regard.**

10

**This supersedes DARA Circular No.3 / 1990.**



**( SRIKRISHAN )**

**EXECUTIVE DIRECTOR ( ATM )**

**New Delhi**

**Dated :16 th. May 2005**

**Copy to : As per standard list.**