Australian Government
Civil Aviation Safety Authority

Advisory Circular

AC 139-17(0) **MARCH 2005**

PREPARING PLANS FOR INCLUSION IN AERODROME MANUALS

CONTENTS

1. REFERENCES

1.1 This Advisory Circular (AC) should be read in conjunction with:

- Appendix 1 to subparagraph 139.095 (a) (i) of the *Civil Aviation Safety Regulations 1998* (CASR).
- Manual of Standards (MOS) Part 139 – Aerodromes — Chapter 5.
- ICAO Annex 4 — Aeronautical Charts.

2. PURPOSE

2.1 The purpose of this AC is to provide aerodrome operators with some guidelines when preparing aerodrome plans, as required by CASR Part 139, for inclusion in their aerodrome manual.

3. STATUS OF THIS AC

3.1 This is the first AC to be written on the subject of preparing plans for inclusion in an aerodrome manual.

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Where an AC is referred to in a 'Note' below the regulation, the AC remains as guidance material.

ACs should always be read in conjunction with the referenced regulations

4. BACKGROUND

4.1 Appendix 1 to subparagraph 139.095 (a) (i) of CASR Part 139 sets out the requirement for operators of certified aerodrome to include a number of plans in their Aerodrome Manuals. A minimum of three plans are called for in the Schedule:

(a) a plan of the aerodrome and its facilities;

(b) a plan of the aerodrome boundaries; and

(c) a locality plan of the aerodrome relative to the main town centre.

4.2 The need for guidance material in preparing these plans has been identified by CASA staff undertaking aviation safety audits of aerodrome manuals, as the content and quality of plans included in aerodrome manuals varies greatly.

4.3 As there are no standardised format or content details in CASR Part 139, or in the MOS Part 139, CASA has provided this AC to help operators in the preparation of these plans. This would then assist CASA to assess compliance with the CASR Part 139 requirements. In addition, a suggested list of items to be included on the plans is also outlined in the following sections.

4.4 Other plans, such as an 'Obstacle Limitation Surfaces' plan, may also be required depending on the size and scale of the aerodrome operation. Aerodrome operators will need to speak with their local CASA Aerodrome Inspector to determine the need for these additional plans.

5. DEFINITIONS

Above Mean Sea Level (AMSL): Mean sea level is the arithmetic mean of the hourly heights of the sea at the tidal station measured over a period of time (usually 19 years or more).

Australian height datum (AHD) is the vertical reference datum that passes through mean sea level at thirty tide gauges located around the Australian coastline.

World Geodetic System 1984 (WGS-84) is the geodetic reference datum adopted by CASA in 1995 for the determination of latitudes and longitudes applicable to Australian aviation. WGS-84 is a consistent set of parameters describing the size and shape of the earth and the position of a network of points with respect to the centre of the earth's mass. Global Positioning Systems (GPS) uses WGS-84 as its geodetic referencing system.

6. GENERAL SURVEY AND PLAN DETAILS

6.1 It is suggested that the following principles be adopted when considering the general survey requirements and the drafting layout details.

6.2 Elevations and Distances

6.2.1 All elevations should be shown in metres AHD. All distances should be shown in metres. Ideally the plan should have a WGS-84 overlay specifying the nearest meridians of latitude and longitude.

6.3 Plan size

6.3.1 The size of the plan should be commensurate with the size and complexity of the aerodrome; however ideally, an A3 or A4 paper copy should be included in the aerodrome manual.

6.3.2 For readability, the plans should also be available in A1 paper size.

6.4 Materials

6.4.1 All plans should be either black ink or colour ink on white paper.

6.5 Scale

6.5.1 The plans should be to a scale suitable to the A3 paper size, however a scale of between 1:3000 and 1:5000 for the Aerodrome Facilities Plan and the Aerodrome Boundary Plan is recommended.

6.5.2 All plans should be clearly labelled with the scale used, including a bar scale.

6.6 North Point

6.6.1 True north, and the magnetic declination (including the degree of annual variation, the direction and the year) should be shown.

6.7 Symbols

6.7.1 Standard survey symbols should be used to represent items on the plan. Where there is no standard survey symbol available - then the ICAO map symbols, as illustrated in Annex 4 Aeronautical Charts, should be used.

6.8 Drafting standards

6.8.1 Drafting standards should conform to Australian Standards ~ AS 1100.

6.9 Survey Accuracy

6.9.1 Survey accuracy should be commensurate with the size and scale of the aerodrome involved.

6.9.2 Horizontal distances should be represented on plans rounded down to the nearest whole metre.

6.9.3 As elevations in the aviation system are based on imperial measurements (i.e. feet) the height of elevations on the plan should be given to the nearest whole foot.

6.9.4 The Runway azimuths should be measured to an accuracy of ± 10 seconds of arc.

7. AERODROME FACILITIES PLAN

7.1 It is suggested that the following principles be adopted when producing the Aerodrome Facilities Plan.

7.2 Title

7.2.1 The title of the plan should be clearly shown in the bottom right hand corner of the plan with the name of the aerodrome and the words “Aerodrome Facilities Plan”.

7.3 Content

7.3.1 Where applicable, the following facilities should be included on the Aerodrome Facilities Plan:

- runways with dimensions labelled
- runway surface types (concrete, asphalt, sealed, gravel, grass)
- runway end elevations (in metres AHD)
- runway strip with dimension labelled
- runway strip end elevations (in metres AHD)
- key runway chainages
- runway markers and markings
- runway strip markers
- stopways
- clearways
- runway end safety areas
- taxiways with names (Alpha, Bravo, etc.)
- taxiway surface types (concrete, asphalt, sealed, gravel, grass) labelled
- taxiway markers and markings
- aprons with names (RPT, GA, Tie Down Area, Private) and types (concrete, asphalt, sealed, gravel, grass) labelled
- apron markings (see paragraph 7.6)
- aerodrome lighting facilities (see paragraph 7.7)
- navigational aids labelled with type (NDB, VOR, DME, etc, — with critical and sensitive areas identified where possible)
- localiser array aerials (with critical and sensitive areas shown)
- glide paths (with critical and sensitive areas shown)
- airside roads
- terminal buildings
- fire stations
- control towers
- other airside buildings
- other main buildings relevant to the operation of the aerodrome
- primary wind indicator
- secondary wind indicators (indicate if lit or unlit)
- compass swing sites
- signal circle
- airside/landside perimeter fence

- airside/landside perimeter gates (with gate numbers labelled)
- heliports, helicopter aiming points, helicopter landing sites
- visual landing aids (T-VASIS/ AT-VASIS or PAPI)
- approach lights
- aerodrome reference point (including elevation)
- lit obstacles on the aerodrome
- drains with type (open unlined, U/G, etc) labelled
- meteorological facilities
- fixed fuel installation

7.3.2 It should be noted, that it may be necessary to have more than one plan to accommodate all of this detail. For example, at large complex aerodromes separate plans for the apron markings and lighting facilities would most likely be needed.

7.4 Permanent survey marks

7.4.1 The position of permanent survey marks (PSM's) at the end of each runway should be indicated, if they have been installed on the aerodrome.

7.5 Runway chainages

7.5.1 The origin of the runway chainage should be such that there are never any negative chainages on the plan.

7.5.2 Always commence the chainages at the end of the runway with the lowest number i.e. for Runway 12/30 start the chainage at the Runway 12 end.

7.5.3 The plan should ideally identify the chainages at all major points along the runway, including:

- runway strip end
- runway end safety areas
- clearway end
- stopway end
- runway end
- runway threshold
- runway intersections
- taxiway intersections
- commencement and conclusion of turning nodes
- access roads to the runway

7.6 Apron Areas

7.6.1 The apron area should be clearly identified.

7.6.2 If the apron is complex, or the aerodrome has commercial passenger aircraft operations above 5700kgs maximum take off weight (MTOW), a separate Apron Facilities Plan should be included in the aerodrome manual.

7.6.2 If a separate Apron Facilities Plan is being prepared, it should show all of the facilities on the apron area. This would include:

- apron markings associated with the movement and parking of aircraft
- aircraft parking bay designations clearly labelled
- apron markings associated with the parking of vehicles and equipment
- apron markings associated with the operation of vehicles and equipment
- earthing points
- hydrant refuelling points
- location of any nose in guidance systems
- any run-up bays or engine start positions
- the limits of the apron area
- any buildings that front onto the apron
- access gates to the airside in the area
- a table showing the maximum size aircraft each bay is designed for
- the co-ordinates of any aircraft parking positions fitted with a nose in guidance system
- a table showing any restrictions on the use of the apron

7.6.3 The scale of the Apron Facilities Plan should be commensurate with the size and scale of the apron area being depicted. The plan should be large enough to show all of the apron facilities and use of multiple plans to cover a large area may be necessary.

7.7 Aerodrome lighting facilities plan

7.7.1 Where there is a lighting system installed at the aerodrome, a plan showing the location of the facilities for the operation of the lighting system should also be included in the aerodrome manual.

7.7.2 If a separate aerodrome lighting facilities plan is being prepared, it should show all of the facilities at the aerodrome used for the operation of the lighting system. This would include:

- approach lights
- runway threshold identification lights
- runway edge lights
- runway end lights
- runway threshold lights
- stopway lights
- turning node lights
- runway guard lights (wig wags)
- visual landing aids (T-VASIS/ AT-VASIS or PAPI)
- taxiway lights
- apron flood lights

- apron edge lights
- obstacle lights on the aerodrome
- illuminated wind indicators
- helicopter landing site lights
- control cables

8. AERODROME BOUNDARY PLAN

8.1 It is suggested that the following principles be adopted when producing the aerodrome boundary plan.

8.2 Title

8.2.1 The title of the plan should be clearly shown in the bottom right hand corner of the plan with the name of the aerodrome and the words "Aerodrome Boundary Plan".

8.3 Boundary

8.3.1 The plan should clearly show the boundary of the area of the aerodrome expressly set aside for aerodrome purposes. This would normally be the area shown on the aerodrome Certificate of Title.

9. AERODROME LOCATION PLAN

9.1 It is suggested that the following principles be adopted when producing an aerodrome location plan.

9.2 Title

9.2.1 The title of the plan should be clearly shown in the bottom right hand corner of the plan with the name of the aerodrome and the words "Aerodrome Location Plan".

9.3 Plan format

9.3.1 The aerodrome location plan should be presented on a background showing the general topographical features of the area, i.e. river, creeks, hills, etc.

9.3.2 The aerodrome location should be shown against the background of other features such as roads, railway lines, nearest town and other significant geographical features.

9.3.3 An up to date topographical database should be used and the plan should be regularly updated.

9.4 North point

9.4.1 The aerodrome location should be located with north up the page, and the north point clearly shown.

9.5 Distance to nearest town

9.5.1 The plan should be clearly labelled with the distance in nautical miles (to one decimal point) and magnetic bearing to the nearest town, settlement or homestead. The location for the centre of the town is to be the Post Office or General Store if there is no Post Office.

9.6 Other aerodrome facilities

9.6.1 The aerodrome location plan should show any aerodrome facilities that are located outside of the aerodrome boundary. This may include:

- radar equipment located off aerodrome
- obstacle lights located on adjacent hills or other nearby obstacles
- approach lights, located off aerodrome land
- navigational aids located away from the aerodrome

10. FURTHER INFORMATION

10.1 For further information on how to prepare a plan for inclusion in an Aerodrome Manual contact your local CASA Aerodrome Inspector or the Aerodrome Specialist in the Operational and Flight Crew Licensing Standards Branch of CASA. Telephone 131 757 (for the cost of a local call) and ask for the Aerodrome Inspector in your area.

Rowena Barrell
Acting Executive Manager
Aviation Safety Standards