Australian Government
Civil Aviation Safety Authority

I, JOHN FRANCIS McCORMICK, Director of Aviation Safety, on behalf of CASA, make this instrument under paragaph 9 (1) (c) of the *Civil Aviation Act 1988* and regulation 139.015 of the *Civil Aviation Safety Regulations 1998*.

[Signed John F. McCormick]
John F. McCormick
Director of Aviation Safety

18 April 2011

Manual of Standards Part 139 Amendment Instrument (No. 1) 2011

1 Name of instrument

This instrument is the *Manual of Standards Part 139 Amendment Instrument (No. 1) 2011*.

2 Commencement

This instrument commences as follows:

(a) on 2 June 2011 — sections 1, 2, 3 and Schedule 1;

(b) on 17 November 2011 — Schedule 2.

3 Amendment of the Manual of Standards Part 139

Schedules 1 and 2 amend the Manual of Standards (MOS) Part 139 — Aerodromes.

Schedule 1 Amendments

[1] Section 1.2, definition of *Instrument runway*

substitute

Instrument runway	One of the following types of runway intended for the operation of aircraft using instrument approach procedures: (a) **Non-precision approach runway**. An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach. (b) **Precision approach runway, Category (CAT) I**. An instrument runway served by ILS and visual aids intended for operations with a decision height (DH) not lower than 60 m (200 ft) and either a visibility not less than 800 m, or an RVR not less than 550 m. (c) **Precision approach runway, CAT II**. An instrument runway served by ILS and visual aids intended for operations with a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft), and an RVR not less than 300 m.

	(d) **Precision approach runway, CAT III**. An instrument runway served by ILS to and along the surface of the runway and: (i) for CAT IIIA — intended for operations with a decision height lower than 30 m (100 ft), or no decision height, and an RVR not less than 175 m; (ii) for CAT IIIB — intended for operations with a decision height lower than 15 m (50 ft), or no decision height, and an RVR less than 175 m but not less than 50 m; (iii) for CAT IIIC — intended for operations with no decision height and no RVR limitations.

[2] Section 1.2, definition of *Runway visual range* (*RVR*)

substitute

Runway visual range (*RVR*)	The range over which the pilot of an aircraft on the centreline of a runway can see the runway surface markings, or the lights delineating the runway or identifying its centreline. **Note:** Within Australia, the term ***runway visual range*** (***RVR*)** is used exclusively in relation to RVR measured by an instrumented system.

[3] Section 1.2, new definitions

insert in correct alphabetical positions

Low visibility procedures	Procedures applied at an aerodrome for protecting aircraft operations during conditions of reduced visibility or low cloud.
Runway visibility (RV)	The distance along a runway over which a person can see and recognise a visibility marker or runway lights.
Visibility marker	A dark object of suitable dimensions for use as a reference in evaluating runway visibility.

[4] After paragraph 6.2.24.2

insert

6.2.24.3 When a runway is in use for an aircraft to land or take off, no mobile object may be on a part of the strip mentioned in paragraph 6.2.24.1.

Note: See subsection 11.1.4A for information regarding siting of equipment and installations on runway strips.

[5] After paragraph 6.2.28.1

insert

Note: See subsection 11.1.4A for information regarding siting of equipment and installations on a RESA.

[6] After paragraph 6.2.34.1

insert

Note:	See subsection 11.1.4A for information regarding siting of equipment and installations on a clearway.

[7] After paragraph 6.3.15.1

insert

Note:	See subsection 11.1.4A for information regarding siting of equipment and installations on a taxiway strip.

[8] Paragraph 6.3.17.1, Table 6.3-5, after the second Note

insert

3. ILS installations may also influence the location of taxiways due to interferences to ILS signals by a taxiing or stopped aircraft. Information on critical and sensitive areas surrounding ILS installations is contained in Annex 10, Volume I, Attachment C.

[9] Paragraph 6.4.4.2

omit

[10] Paragraph 6.4.4.2, Table 6.4-1, Column 4, Precision Category I

substitute

Precision Category I
60 m[e, f]
60 m[e, f]
90 m[b, e, f]
90 m[d, e, f]

[11] Paragraph 6.4.4.2, Table 6.4-1, Column 5, Precision Category II or III

substitute

Precision Category II or III
105 m[c, e, f]
105 m[c, d, e, f]

[12] Paragraph 6.4.4.2, Table 6.4-1, after footnote d

insert

e This distance may be decreased 5 m for every 1 m the bay or holding position is lower than the threshold, provided that the inner transitional surface is not infringed.

f This distance may be increased to avoid interference with radio navigation aids, particularly the glide path and localizer facilities. Advice on ILS critical and sensitive areas should be obtained from the relevant aeronautical telecommunications service and radio navigation service provider.

[13] After paragraph 7.1.3.3

insert

Note:	See subsection 11.1.4A for information regarding siting of equipment and installations on operational areas.

[14] After subsection 7.2.3

insert

7.2.4 Precision Approach Terrain Charts – ICAO

7.2.4.1 A Precision Approach Terrain Chart – ICAO provides detailed terrain profile information within a defined portion of the final approach to enable aircraft operators to assess the effect of the terrain on decision height determination by the use of radio altimeters.

7.2.4.2 A Precision Approach Terrain Chart – ICAO must be made available for each precision approach runway Category II and Category III, unless the same relevant information is provided in the Aerodrome Terrain and Obstacle Chart – ICAO (Electronic) in accordance with ICAO Annex 4.

7.2.4.3 A Precision Approach Terrain Chart – ICAO must be revised as soon as practicable after any significant change occurs to the relevant terrain profile.

7.2.4.4 A Precision Approach Terrain Chart – ICAO must conform to the standards and procedures set out in ICAO Annex 4.

[15] Subsection 8.3.7

substitute

8.3.7 Aiming Point Markings

Note:	Aiming Point Markings were previously known as Runway Fixed Distance Markings.

8.3.7.1 An aiming point marking must be provided at each approach end of each sealed, concrete or asphalt runway that is 30 m or more wide and 1500 m or more long.

Note:	An aiming point marking should be provided at each approach end of each sealed, concrete or asphalt instrument runway that is less than 1500 m long.

8.3.7.2 An aerodrome operator may elect to retain a fixed distance marking that was:

(a) provided under subsection 8.3.7 before 2 June 2011; and

(b) in use immediately before 2 June 2011;

until not later than:

(c) for international aerodromes — 30 May 2013; or

(d) for other aerodromes — 29 May 2014.

Note: When an aerodrome operator elects to implement an aiming point marking by providing an appropriate marking, the operator should raise a NOTAM for a period of 2 months after so providing or determining, to inform pilots about the presence of the marking.

8.3.7.3 For a precision approach runway with an available landing distance mentioned in a column of Table 8.3-1 (the ***Table***), the aiming point marking must:

(a) commence no closer to the threshold than the distance indicated in the same column, except that, on a runway with a visual approach slope indicator system (VASIS), the beginning of the marking must coincide with the origin of the visual approach slope; and

(b) consist of 2 conspicuous stripes whose dimensions, and lateral spacing between inner sides, must accord with the measurements set out in the same column.

Note: For a precision approach runway, it is recommended that implementation of aiming point marking should also be accompanied by implementation of the ICAO 'A' – basic pattern touchdown zone marking. **See Figure 8.3-7A.1.**

Table 8.3-1: Location and dimensions of aiming point marking

Landing distance available				
Location and dimensions	**Less than 800 m**	**800 m up to, but not including, 1200 m**	**1200 m up to, but not including, 2400 m**	**2400 m and above**
Distance from threshold to beginning of marking	150 m	250 m	300 m	400 m
Length of stripe[a]	30-45 m	30-45 m	45-60 m	45-60 m
Width of stripe	4 m	6 m	9 m	9 m
Lateral spacing between inner sides of stripes	6 m[b]	9 m[b]	18-23 m[c]	18-23 m

[a] The greater dimensions of the specified ranges are intended to be used where increased conspicuity is required.

[b] These figures were deduced by reference to the outer main gear wheel span which is element 2 of the aerodrome reference code at Chapter 2, Table 2.1-1: Aerodrome Reference Code.

[c] The lateral spacing may be varied within these limits to minimize the contamination of the marking by rubber deposits.

8.3.7.4 For a non-precision approach runway, or a non-instrument runway, the aiming point marking must comply with:

(a) the following:

(i) the marking must consist of 2 conspicuous stripes, each 45 m in length, each having a width (***W***), and each with inside edges separated by a distance (***D***);

(ii) the ends of the stripes nearest the threshold must be located at 300 m from the line of the runway threshold;

(iii) for sub-subparagraph (i), W and D must be in accordance with the following table:

Runway width	W	D
30 m	6 m	17 m
45 m or more	9 m	23 m

or

(b) the relevant precision approach runway standard.

8.3.7A Touchdown Zone Marking

8.3.7A.1 A touchdown zone marking must be provided at each end of a sealed, concrete or asphalt runway 30 m wide or greater and 1500 m long or greater.

Note: A touchdown zone marking may be provided at both ends of other sealed, concrete or asphalt runways.

8.3.7A.2 A touchdown zone marking must conform to the following pattern:

(a) on a precision approach runway — the ***ICAO 'A' – basic*** pattern, as described in this section (the ***ICAO 'A' – basic pattern***); or

(b) on other runways — the ICAO 'A' – basic pattern, or the ***simple pattern*** as described in this section

Note: Formerly, the simple pattern touchdown zone marking was the standard pattern for all Australian touchdown zone markings.

8.3.7A.3 An aerodrome operator may retain a simple pattern touchdown zone marking on a precision runway until not later than:

(a) for international aerodromes — 30 May 2013; or

(b) for other aerodromes — 29 May 2014.

Notes:

1. When an aerodrome operator implements the ICAO 'A' – basic pattern touchdown zone marking, the operator should raise a NOTAM for a period of 2 months after the implementation to inform pilots about the revised marking.
2. For a precision approach runway, it is recommended that implementation of the ICAO 'A' – basic pattern touchdown zone marking should be accompanied by implementation of aiming point marking.

8.3.7A.4 The ICAO 'A' – basic pattern touchdown zone marking consists of pairs of rectangular markings symmetrically disposed about the runway centreline as

shown in Figure 8.3-7A.2. Subject to paragraph 8.3.7A.5, the numbers and locations of such pairs are to be in accordance with Table 8.3-2.

Table 8.3-2: Pairs of rectangular markings for ICAO 'A' – basic pattern touchdown zone marking

Item	Landing distance available, or the distance between thresholds (where the touchdown zone marking is displayed at both of the approach directions)	Pair(s) of touchdown zone markings	Location of each pair of touchdown zone markings (distance in metres from threshold)
1	less than 900 m	1	300
2	900 m up to, but not including, 1200 m	2	150 and 450
3	1200 m up to, but not including, 1500 m	3[a]	150, 300, 450 and 600
4	1500 m up to, but not including, 2400 m	4[a]	150, 300, 450, 600 and 750
5	2400 m or more	5[a]	150, 300, 450, 600, 750 and 900

[a] The touchdown zone marking within 50 m of the aiming point marking must be omitted – see paragraph 8.3.7A.5.

8.3.7A.5 For a landing distance available, or distance between thresholds, mentioned in item 3, 4 or 5 of Table 8.3-2, a touchdown zone marking that would be within 50 m of the aiming point marking must be omitted.

8.3.7A.6 Each ICAO 'A' – basic pattern touchdown zone marking must:

(a) be not less than 22.5 m long and 3 m wide; and

(b) have a lateral spacing between the inner sides of the rectangles equal to that of the aiming point marking.

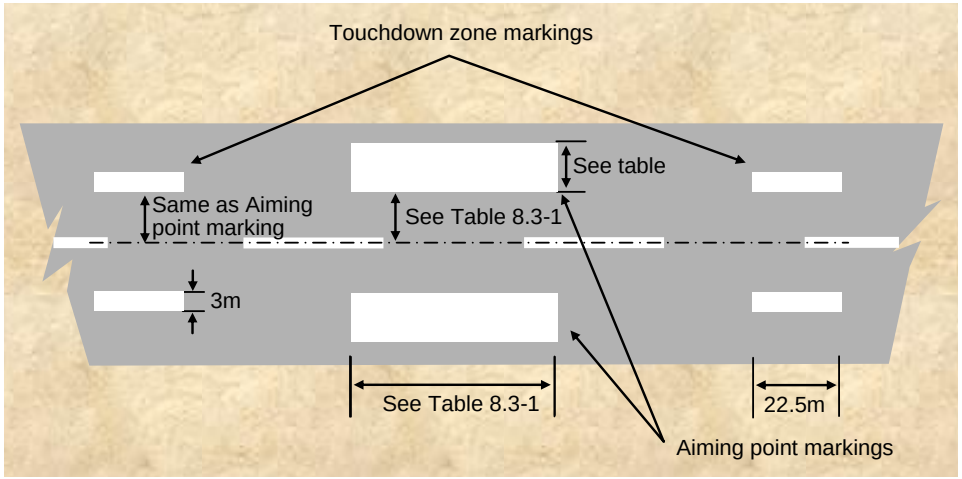

Figure 8.3-7A.1: Aiming point and ICAO 'A' – basic pattern touchdown zone markings — dimensions

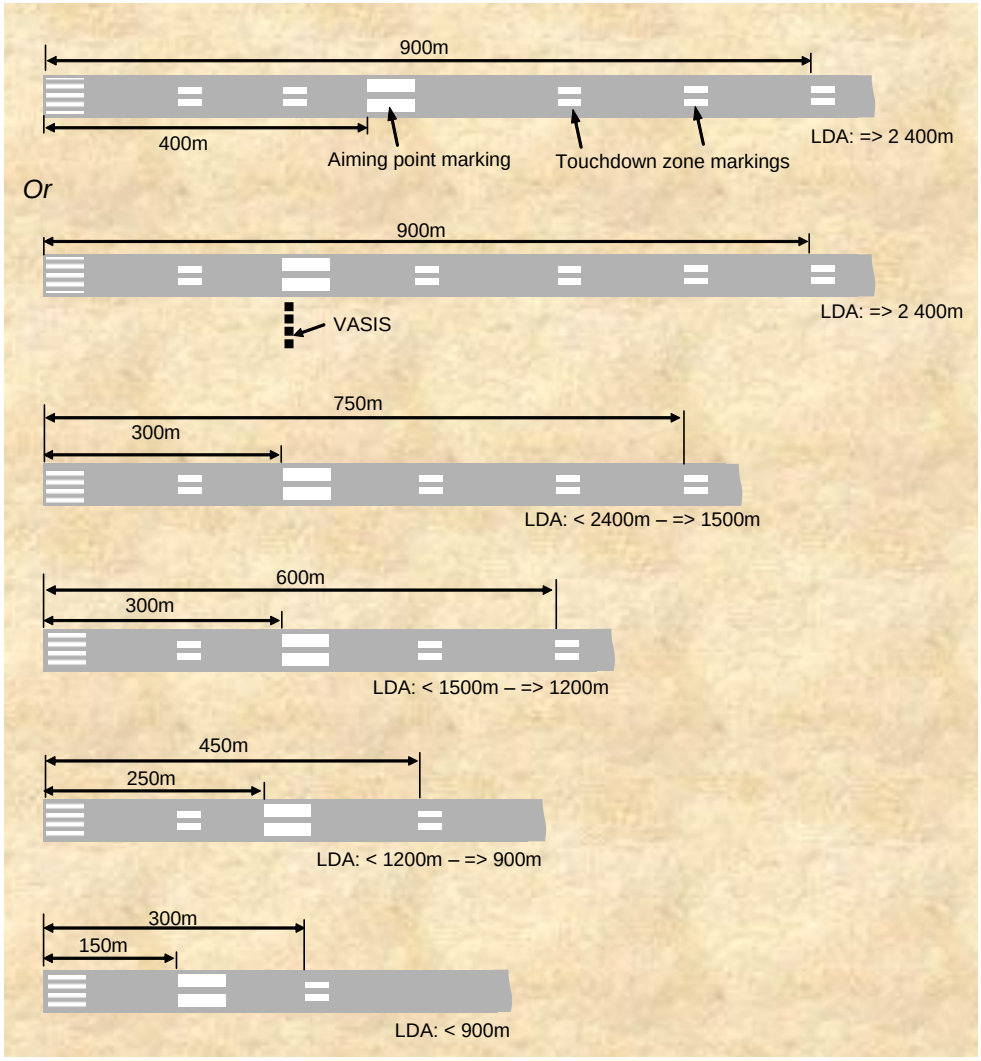

Figure 8.3-7A.2: Aiming point and ICAO 'A' – basic pattern touchdown zone markings – Examples

8.3.7A.7 A simple touchdown zone marking is as shown in Figure 8.3-7A.3 and must comprise 4 white stripes each not less than 22.5 m long and 3 m wide, located in pairs such that the ends nearest the threshold of each pair of stripes are 150 m and 450 m respectively from the line of the runway threshold. The lateral spacing between their inner sides must be equal to that of the aiming point marking.

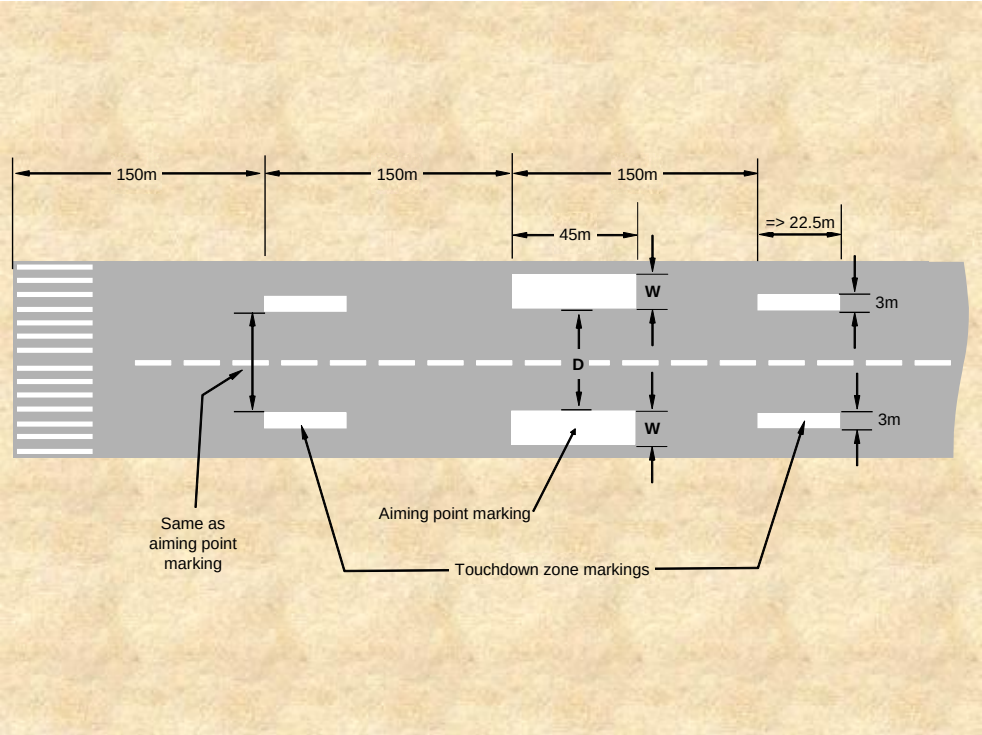

Figure 8.3-7A.3: Aiming point and simple touchdown zone markings

8.3.7A.8 If simple runway touchdown zone markings are provided on runways less than 1500 m in length, the markings at 450 m from the end of the runway threshold may be omitted.

[16] Subparagraph 9.1.1.1 (d)

substitute

(d) for operations of the kind mentioned in sub-subparagraph (i) or (ii) — 29 May 2014, or an earlier date if an aerodrome operator so elects and tells CASA in writing of the election, being aerodrome operations supporting:

(i) approaches in which the meteorological minima are as follows:

(A) decision height or minimum descent height less than 200 ft;

(B) visibility or runway visual range less than 550 m; or

(ii) take-offs in visibility of less than 550 m; or

(e) in exceptional circumstances, CASA determines that in the interests of safety a lighting facility must meet the standards of this Chapter.

[17] Paragraph 9.1.11.1, the Note

substitute

Notes:

1. For guidance on frangibility, see:

   (a) ICAO Aerodrome Design Manual Part 4 – Visual Aids, Chapter 15, Frangibility of Visual Aids; and

   (b) ICAO Aerodrome Design Manual Part 6 – Frangibility.

2. See subsection 11.1.4A for information regarding siting of equipment and installations on operational areas.

[18] After paragraph 9.1.14.9A

insert

> **Note:** A runway meant for use in visibility conditions of less than 550 m should have a suitable monitoring system for informing ATC and the operator's maintenance crew when the serviceability level of any of the following lighting systems falls below the minimum level for the system:
>
> (a) approach lighting;
>
> (b) runway centreline;
>
> (c) runway threshold;
>
> (d) runway edge;
>
> (e) touchdown zone;
>
> (f) runway end;
>
> (g) stop bars;
>
> (h) essential taxiways.

[19] Subsection 9.7.2

substitute

9.7.2 Precision Approach Category I Lighting System

9.7.2.1 A precision approach Category I lighting system must be provided to serve a precision approach runway Category I, as far as physically practicable.

Location

9.7.2.2 A precision approach Category I lighting system must consist of a row of lights on the extended centreline of the runway extending, wherever possible, over a distance of 900 m from the runway threshold, with a row of lights forming a crossbar 30 m in length at a distance of 300 m from the runway threshold.

> **Note:** The installation of an approach lighting system of less than 900 m in length may result in operational limitations on the use of the runway.

9.7.2.3 The lights forming the crossbar must be:

(a) as nearly as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centreline lights; and

(b) spaced so as to produce a linear effect, except that gaps may be left on each side of the centreline provided:

(i) the spacing of gaps is kept to a minimum to meet local requirements; and

(ii) no gap exceeds 6 m.

> **Notes:**
>
> 1. Spacings for the crossbar lights between 1 m and 4 m are in use. Gaps on each side of the centreline may improve directional guidance when approaches are made with a lateral error, and facilitate the movement of rescue and firefighting vehicles.
> 2. See ICAO Annex 14, Attachment A, Section 11 for guidance on installation tolerances.

9.7.2.4 The lights forming the centreline must be placed at longitudinal intervals of 30 m with the innermost light located 30 m from the threshold.

9.7.2.5 The lighting system must lie as nearly as practicable in the horizontal plane passing through the threshold, and be such that:

(a) no object, other than an ILS azimuth antenna, protrudes through the plane of the approach lights within a distance of 60 m from the centreline of the system; and

(b) no light, other than a light located within the central part of a crossbar or a centreline barrette (not their extremities), is screened from an approaching aircraft.

Antenna protrusions

9.7.2.6 An ILS azimuth antenna protruding through the plane of the lights must be treated as an obstacle and marked and lighted accordingly.

Characteristics

9.7.2.7 The centreline and crossbar lights of a precision approach Category I lighting system must:

(a) be fixed lights showing variable white; and

(b) for each centreline light position — consist of:

(i) 1 light source in the innermost 300 m of the centreline, 2 light sources in the central 300 m of the centreline and 3 light sources in the outer 300 m of the centreline, to provide distance information; or

(ii) a barrette.

9.7.2.8 A barrette must be:

(a) at least 4 m in length; and

(b) if composed of lights approximating to point sources — composed of such lights uniformly spaced at intervals of not more than 1.5 m.

9.7.2.9 If the centreline consists of barrettes in accordance with sub-subparagraph 9.7.2.7 (b) (ii), each barrette that is at least 300 m from the threshold must be supplemented by a capacitor discharge light which must:

(a) be flashed twice a second in sequence, beginning with the outermost light and progressing toward the threshold to the innermost light of the system; and

(b) be of such electrical circuit design that it can be operated independently of the other lights of the approach lighting system.

9.7.2.10 If the centreline consists of lights as described in subparagraph 9.7.2.7 (a):

(a) crossbars of lights (additional to the crossbar of lights at 300 m from the threshold) must be provided at 150 m, 450 m, 600 m and 750 m from the threshold; and

(b) the lights forming each crossbar must be:

(i) as nearly as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centreline lights; and

(ii) spaced so as to produce a linear effect, except that gaps may be left on each side of the centreline provided:

(A) the number of gaps is kept to a minimum to meet local requirements; and

(B) no gap exceeds 6 m.

9.7.2.11 Where the additional crossbars described in 9.7.2.10 are incorporated in the system, the outer ends of the crossbars must lie on two straight lines that converge to meet the runway centreline 300 m from threshold.

9.7.2.12 Figure 9.7-1 below illustrates both kinds of precision approach Category I lighting configurations mentioned in this section.

9.7.2.13 The lights must be in accordance with the specifications of Section 9.8, Figure 9.8-1.

Note:	ICAO Annex 14, Attachment A, Section 11 provides information on the flight path envelopes used in the design of these lights.

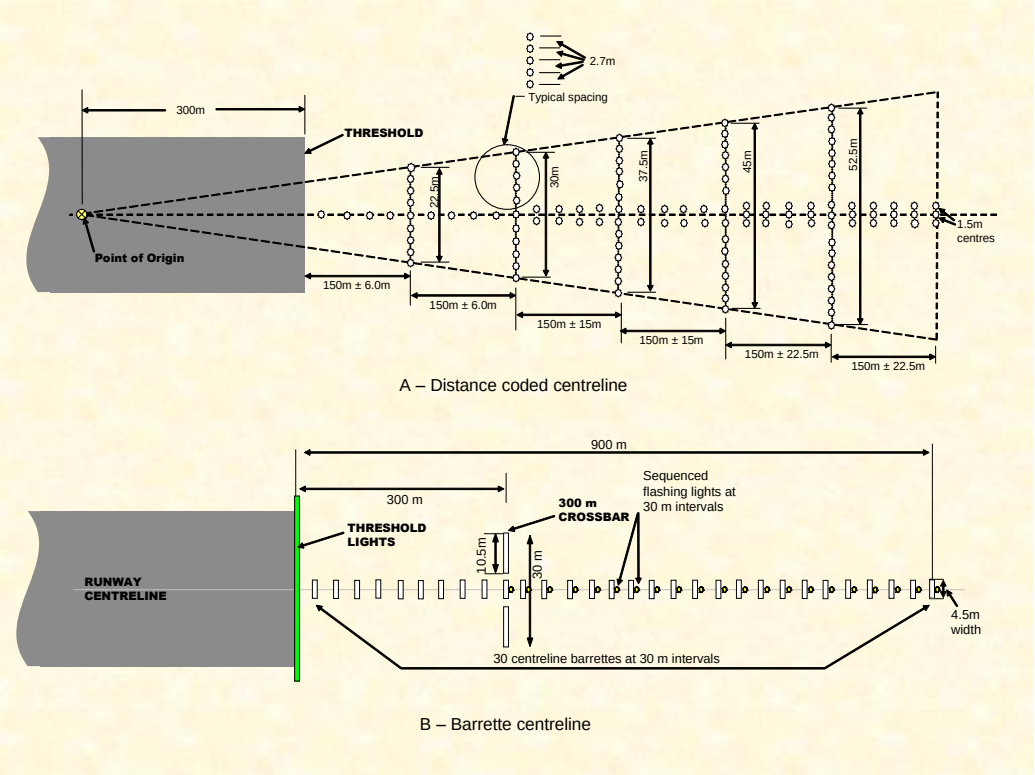

Figure 9.7-1: Precision approach Category I lighting systems

[20] Subsection 9.7.3

substitute

9.7.3 Precision Approach Categories II and III Lighting System

9.7.3.1 A precision approach Category II and Category III lighting system must be provided to serve a precision approach runway Category II or III.

Note:	Where a precision approach Category II and Category III lighting system is provided, touchdown zone lights must also be provided.

Location

9.7.3.2 The approach lighting system must consist of a row of lights on the extended centreline of the runway, extending, wherever possible, over a distance of 900 m from the runway threshold, with:

(a) 2 side rows of lights, extending 270 m from the threshold; and

(b) 2 crossbars, 1 at 150 m and 1 at 300 m from the threshold, as shown in Figure 9.7.2.

Note: The length of 900 m is based on providing guidance for operations under Categories I, II and III conditions. Reduced lengths may support Categories II and III operations but may impose limitations on Category I operations.

9.7.3.3 The centreline lights must be at longitudinal intervals of 30 m, with the innermost lights located 30 m from the threshold.

9.7.3.4 The side row lights must be placed:

(a) on each side of the centreline; and

(b) at a longitudinal spacing equal to that of the centreline lights; and

(c) with the first light located 30 m from the threshold; and

(d) so that the lateral spacing (or gauge) between the innermost lights of the side rows is not less than 18 m nor more than 22.5 m, but in any event equal to that of the touchdown zone lights.

9.7.3.5 The crossbar provided at 150 m from the threshold must fill in the gaps between the centreline and side row lights.

9.7.3.6 The crossbar provided at 300 m from the threshold must extend on both sides of the centreline lights to a distance of 15 m from the centreline.

9.7.3.7 If the centreline beyond a distance of 300 m from the threshold consists of lights as described in subparagraph 9.7.3.12 (b), additional crossbars of lights must be provided at 450 m, 600 m and 750 m from the threshold.

9.7.3.8 Where the additional crossbars described in 9.7.3.7 are incorporated in the system, the outer ends of these crossbars must lie on two straight lines that converge to meet the runway centreline 300 m from the threshold.

9.7.3.9 The lighting system must lie as nearly as practicable in the horizontal plane passing through the threshold, and be such that:

(a) no object, other than an ILS azimuth antenna, may protrude through the plane of the approach lights within a distance of 60 m from the centreline of the system; and

(b) no light, other than a light located within the central part of a crossbar or a centreline barrette (not their extremities), may be screened from an approaching aircraft.

Antenna protrusions

9.7.3.10 An ILS azimuth antenna protruding through the plane of the lights must be treated as an obstacle and marked and lighted accordingly.

Characteristics

9.7.3.11 The centreline of a precision approach Categories II and III lighting system for the first 300 m from the threshold must consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centreline may consist of single light sources showing variable white.

9.7.3.12 Beyond 300 m from the threshold, each centreline light position must consist of 1 of the following which all must show variable white:

(a) 1 barrette as used on the inner 300 m;

(b) 2 light sources in the central 300 m of the centreline, and 3 light sources in the outer 300 m of the centreline.

9.7.3.13 A barrette must be:

(a) at least 4 m in length; and

(b) if composed of lights approximating to point sources — composed of such lights uniformly spaced at intervals of not more than 1.5 m.

9.7.3.14 If the centreline beyond a distance of 300 m from the threshold consists of barrettes as described in subparagraph 9.7.3.12 (a), each barrette must be supplemented by a capacitor discharge light which must:

(a) be flashed twice a second in sequence, beginning with the outermost light and progressing toward the threshold to the innermost light of the system; and

(b) be of such electrical circuit design that it can be operated independently of the other lights of the approach lighting system.

9.7.3.15 Each side row of lights must consist of a barrette:

(a) whose lights show red; and

(b) whose length and light spacing must be equal to the length and light spacing of the barrettes in the touchdown zone.

9.7.3.16 The lights forming the crossbars must be:

(a) fixed lights showing variable white; and

(b) uniformly spaced at intervals of not more than 2.7 m.

9.7.3.17 The intensity of the red lights must be compatible with the intensity of the white lights.

9.7.3.18 The lights must be in accordance with the specifications of Section 9.8, Figure 9.8-1 and Figure 9.8-2.

Note: ICAO Annex 14, Attachment A, Section 11 provides information on the flight path envelopes used in the design of these lights.

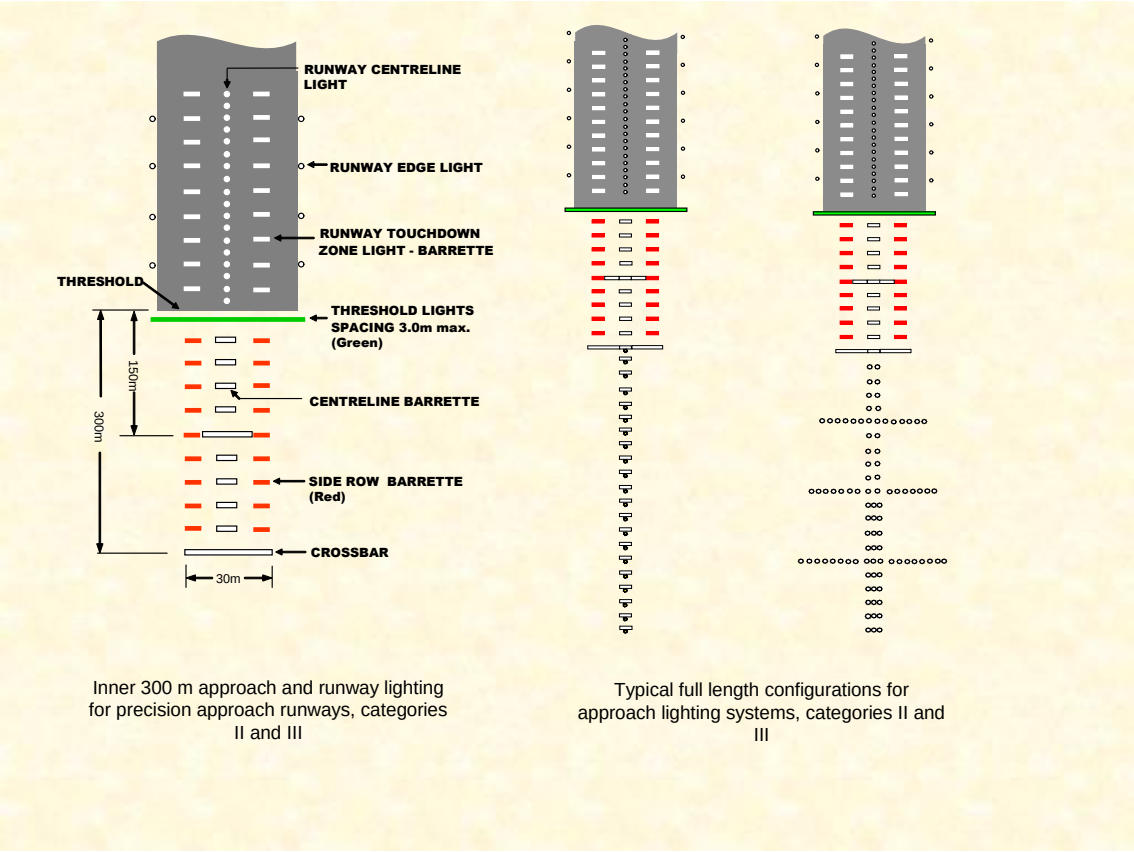

Figure 9.7-2: Precision approach lighting system, Categories II and III

[21] Subparagraph 9.10.18.1 (a)

omit

6 lights

insert

at least 6 lights

[22] After paragraph 9.10.18.1

insert

9.10.18.2 For a precision approach runway Category III, the spacing between runway end lights must not exceed 6 m.

[23] After paragraph 9.10.25.1

insert

Note:	Where a precision approach Category II or Category III lighting system is provided, touchdown zone lights must also be provided.

[24] Paragraph 9.10.25.2

omit

[25] Subparagraph 9.13.11.2 (a)

substitute

(a) showing green and yellow, alternately, from the point where they begin near the runway centreline, to whichever of the following is furthest from the runway:

(i) the perimeter of the ILS critical and sensitive area;

(ii) the lower edge of the inner transitional surface; and

[26] After subsection 9.19.3

insert

9.19.4 Road-holding Position Light

9.19.4.1 A road-holding position light must be provided at each road-holding position serving a runway if it is intended that the runway will be used in RVR conditions of less than 350 m.

9.19.4.2 A road-holding position light must:

(a) conform to the standards specified in ICAO Annex 14; or

(b) be capable of demonstrating an outcome equivalent to that of light which does conform.

Note:	See subsection 11.1.4A for the mass and height limitations and frangibility requirements of navigation aids located on runway strips.

[27] Paragraph 9.20.2.5 (d) and the Note

substitute

(d) for a precision approach runway Category II or III:

(i) more than 5% of the lights are on outage in any of the following elements:

(A) the inner 450 m of the approach lighting system;

(B) the runway centreline lights;

(C) the runway threshold lights; or

(D) the runway edge lights; or

(ii) more than 10% of the lights are on outage in the touchdown zone lights; or

(iii) more than 15% of the lights are on outage in the approach lighting system beyond 450 m; or

(iv) in any case other than a barrette or a crossbar — 2 or more adjacent lights are on outage; or

(v) for a barrette or a crossbar — 3 or more adjacent lights are on outage; and

(e) in the case of a runway meant for take-off in visibility conditions of less than 550 m:

(i) more than 5% of the lights are on outage in any of the following elements:

(A) runway centreline lights (where provided); and

(B) runway edge lights; or

(ii) 2 or more adjacent lights are on outage; and

(f) in the case of a taxiway intended for use in RVR conditions of less 350 m, 2 or more adjacent taxiway centreline lights are on outage; and

(g) in the case of any other lighting system with more than 13 lights:

(i) more than 15% of the lights are on outage; or

(ii) 2 or more adjacent lights are on outage.

Note: For this subsection, a lighting system means lights used to illuminate a particular facility, for example:

(a) all of the lights used to mark a threshold; or

(b) all of the lights used to mark a runway end; or

(c) all of the runway edge lights on a runway; or

(d) all of the taxiway centreline lights on a length of taxiway between intersections.

[28] After subsection 11.1.4

insert

Notes:

1. Requirements for obstacle limitation surfaces are specified in Chapter 7.
2. The design of markers, signs, light fixtures and their supporting structures, and light units of visual approach slope indicators is specified in sections 8.2, 8.6, 9.1 and 9.9, respectively. Guidance on the frangible design of visual and non-visual aids for navigation is given in the Aerodrome Design Manual (Doc 9157) Part 6.

11.1.4A Siting of Equipment and Installations on Operational Areas

11.1.4A.1 Unless its function requires it to be there for air navigation purposes, equipment or an installation must not be located:

(a) on a runway strip, a runway end safety area, or a taxiway strip, if it would endanger an aircraft; or

(b) within the area specified in Table 6.3-5 as the minimum separation distance between the centreline of a taxiway (including an apron taxiway) and a building, structure, vehicle, wall, plant, equipment, parked aeroplane or road, if it would endanger an aircraft; or

(c) on a clearway, if it would endanger an aircraft in the air.

11.1.4A.2 Equipment or an installation required for air navigation purposes must be frangible and mounted as low as possible if it is located on any of the following:

(a) that portion of a runway strip within:

(i) 75 m of the runway centreline — where the runway code number is 3 or 4; or

(ii) 45 m of the runway centreline — where the runway code number is 1 or 2; or

(b) a runway end safety area or a taxiway strip; or

(c) within the distances specified in Table 6.3-5 between a taxiway centreline and a paragraph 6.3.17.1 (c) object; or

(d) on a clearway.

Notes:

1. Any equipment or installation required for air navigation purposes which must be located on the non-graded portion of a runway strip should be regarded as an obstacle and should be frangible and mounted as low as possible.

2. Guidance on the siting of navigation aids is contained in the Aerodrome Design Manual (Doc 9157) Part 6.

11.1.4A.3 Unless its function requires it to be there for air navigation purposes, for a precision approach runway Category I, II or III, equipment or an installation must not be located within the following distances:

(a) 240 m from the end of the runway strip;

(b) 60 m from the extended centreline — where the runway code number is 3 or 4; or

(c) 45 m from the extended centreline — where the code number is 1 or 2.

11.1.4A.4 Equipment or an installation required for air navigation purposes must be frangible and mounted as low as possible if it is located on or near the runway strip of a precision approach runway Category I, II or III, and it is:

(a) situated on that portion of the strip within 77.5 m of the runway centreline — where the code number is 4 and the code letter is F; or

(b) situated within 240 m from the end of the strip and within:

(i) 60 m of the extended runway centreline — where the code number is 3 or 4; or

(ii) 45 m of the extended runway centreline — where the code number is 1 or 2; or

(c) penetrating the inner approach surface, the inner transitional surface or the balked landing surface.

Note: Any equipment or installation required for air navigation purposes which is an obstacle of operational significance in accordance with Section 7.4 should be frangible and mounted as low as possible.

[29] Subsection 11.1.8

substitute

11.1.8 Instrument Landing System

11.1.8.1 An instrument landing system (***ILS***) has the following components:

(a) VHF localizer equipment;

(b) UHF glide path equipment;

(c) VHF marker beacons or distance measuring equipment (***DME***);

(d) monitor systems, remote control and indicator equipment.

11.1.8.2 Each component performs specific functions, and is separately located along the longitudinal axis of, or alongside, the runway.

> **Note:** Different siting requirements, and restrictions to access and movement, apply to each site.

[30] Subsection 11.1.9

substitute

11.1.9 Protection of ILS Installations

11.1.9.1 An aerodrome operator must consult with the relevant aeronautical telecommunications service and radio navigation service provider to establish adequate arrangements for ensuring that ILS installations are not adversely affected by:

(a) electromagnetic interference; or

(b) the presence or construction of buildings; or

(c) the presence of temporary or permanent structures.

> **Notes:**
>
> 1. Electromagnetic interference (EMI) can be produced by a variety of sources including power lines, substations and some industrial-scientific-medical equipment.
> 2. Buildings and other structures can reflect ILS signals in unwanted directions, distorting the information provided to aircraft.
> 3. For aerodrome planning, aerodrome operators should consult relevant aeronautical telecommunications service and radio navigation service providers to ensure adequate provision is made for ILS installations and the necessary critical and sensitive areas.

[31] Subsection 11.1.10

substitute

11.1.10 Critical and Sensitive Areas

11.1.10.1 An aerodrome operator must consult with the relevant aeronautical telecommunications service and radio navigation service provider to establish and define appropriate:

(a) critical areas for each ILS installation; and

(b) sensitive areas for Categories II and III ILS installations.

> **Notes:**
>
> 1. An ILS critical area is an area about the localizer and glide path antennas where vehicles and aircraft must be excluded during all ILS operations. The critical area is protected because the presence of vehicles or aircraft inside its boundaries will cause unacceptable disturbance to the ILS signal-in-space.
> 2. An ILS sensitive area is an area extending beyond the critical area where the parking and movement of vehicles and aircraft is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. The sensitive area is protected against interference caused by large moving objects outside the critical area but still normally within the airfield boundary.

3. The size and shape of a critical or sensitive area depends on the characteristics of the particular ILS system and the configuration of the particular environment.

4. A critical area may separately be established for vehicles and aircraft of particular sizes.

11.1.10.2 An aerodrome operator must ensure that the boundaries of each critical area are marked by suitable signs and visual markers to prevent unauthorised access from vehicles and persons.

11.1.10.3 An aerodrome operator must place signs at each road access point to an ILS critical area to warn drivers and pedestrians against entering the critical area without authority.

11.1.10.4 An aerodrome operator must not permit:

(a) vehicles and plant to enter, or remain in, an ILS critical area while the ILS is in use; or

(b) construction access or variation to such access within a critical or sensitive area unless the construction access or variation has been coordinated with the relevant aeronautical telecommunications service and radio navigation service provider.

11.1.10.5 Where access to a critical area is required for a particular purpose, an aerodrome operator must arrange for the ILS to be temporarily removed from service and a NOTAM issued to inform pilots. Any subsequent related access to the critical area must be under ATC control.

Note: An example of a particular purpose is grass cutting.

11.1.10.6 If low visibility procedures are in effect, an aerodrome operator must not permit vehicles or plant to enter, or remain in, an ILS sensitive area unless ATC has given the operator a specific clearance for the vehicles or plant to enter or remain.

[32] Subsection 11.1.11

substitute

11.1.11 Obstructions around Marker Beacons

11.1.11 None of the following may extend above an elevation angle of 30 degrees from a point 1.5 m above ground level at the location of a marker beacon antenna:

(a) a building;

(b) a power line;

(c) a telephone line;

(d) a tree or a clump of trees.

Schedule 2 Amendments

[1] Paragraph 5.1.2.5

substitute

5.1.2.5 **Approach and Runway Lighting.** For each runway, the following details of approach and runway lighting systems must be provided:

(a) type, length and intensity of approach lighting system;

(b) runway threshold lights, colour and wing bars;

(c) type of visual approach slope indicator system;

(d) length of runway touchdown zone lights;

(e) length, spacing, colour and intensity of runway centreline lights;

(f) length, spacing, colour and intensity of runway edge lights;

(g) colour of runway end lights and wing bars;

(h) length and colour of stopway lights.

5.1.2.5A **Other Lighting and Secondary Power Supply.** The following details of aerodrome lighting and secondary power supply systems must be provided:

(a) location, characteristics and hours of operation of aerodrome beacon (if any);

(b) lighting systems for taxiways;

(c) any other lighting systems;

(d) secondary power supply including switch-over time.

[2] After paragraph 5.1.2.10

insert

5.1.2.11 **Low Visibility Procedures**. If low visibility procedures are established at a controlled aerodrome, the information to be provided must include the following:

(a) the runways and associated equipment that are used under low visibility procedures;

(b) minimum take off and landing visibility for which the aerodrome facilities are capable of providing appropriate support;

(c) defined meteorological conditions under which low visibility procedures are initiated, used and terminated;

(d) a description of ground marking and lighting for use under low visibility procedures.

[3] Section 10.17

substitute

Section 10.17: Aerodrome Safety Procedures during Conditions of Reduced Visibility or Low Cloud

10.17.1 Introduction

10.17.1.1 The operator of a controlled aerodrome must establish low visibility procedures (***LVP***) in accordance with paragraph 10.17.2.1 to ensure the safety of aircraft operations in conditions of reduced visibility or low cloud.

Note: Aircraft operations at aerodromes during reduced visibility or low cloud conditions present additional hazards to the aircraft and to other aerodrome users. As visibility reduces, the ability of air traffic service staff, pilots, vehicle drivers and other personnel to identify hazards and to take remedial action in a timely manner becomes limited. In conditions of low cloud, the time available for the pilot of an approaching aircraft to assess the aerodrome environment visually is reduced.

10.17.2 Development of Low Visibility Procedures

10.17.2.1 LVP must:

(a) be the subject of proper consultation with any party likely to be affected by them, including ATC and aerodrome service providers; and

(b) take into account local conditions; and

(c) as a minimum, address the following matters:

(i) the specific circumstances in which LVP are to be implemented or terminated;

(ii) aerodrome procedures and facilities for supporting the desired movement rate;

(iii) training and authorisation for drivers and other personnel to work airside during the operation of low visibility procedures;

(iv) control of airside operations by means of vehicles or personnel;

(v) withdrawal of non-essential vehicles and personnel;

(vi) suspension of routine maintenance on visual and non-visual aids.

(vii) securing access and preventing inappropriate or inadvertent entry;

(viii) adequate provision for alerting airlines and other affected organisations;

(ix) coordination of procedures and activities with air traffic services;

(x) physical checking of lighting installations and warning devices such as signage;

(xi) protection of ILS critical and sensitive areas;

(xii) emergency procedures.

Note: Further guidance on low visibility procedures and surface movement control under varying conditions can be found in the ICAO *Manual of Surface Movement Guidance and Control Systems* (SMGCS) [Doc 9476-AN/927].

10.17.3 Implementation of Low Visibility Procedures

10.17.3.1 The aerodrome operator must implement LVPs if:

(a) the visibility on any part of the aerodrome is insufficient for ATC to exercise control over all traffic on the basis of visual surveillance; or

(b) the cloud ceiling is less than 200 ft; or

(c) the visibility on any part of the aerodrome is less than 800 m.

10.17.3.2 To commence operations using LVP for this section, the aerodrome operator must:

(a) complete all aerodrome operator preparations necessary for LVP to commence; and

(b) confirm to ATC that the aerodrome operator preparations are complete.

Notes:

1. The point at which restrictions on aerodrome operations should be progressively introduced as the weather deteriorates will vary from aerodrome to aerodrome depending on local conditions. The point should relate to a specific RVR or RV measurement in a worsening weather situation and should be based on the rate of weather deterioration and the amount of lead time necessary to implement extra measures.
2. In order to continue unrestricted operations for as long as possible whilst weather conditions deteriorate, LVP should be designed to implement most of the ground-based measures in good time, and in certain circumstances before they are absolutely necessary. The final measures should be implemented only when the weather conditions demand it. However, there is potential for misunderstandings to occur as to the status of LVP at the aerodrome. Procedures should ensure that the potential for such misunderstandings is minimised and that there is a single point from which definitive information about the current status of LVPs can be confirmed.
3. ATC will inform pilots that LVP are in force, but only after:
   (a) ATC has verified that all LVP measures at the aerodrome are in place; and
   (b) for an aerodrome conducting precision approach Category II or III operations or localiser-guided take-offs — procedures are in place to safeguard ILS critical and sensitive areas, or ILS localiser critical and sensitive areas.

10.17.4 Review of Low Visibility Procedures

10.17.4.1 Each aerodrome operator, in consultation and co-operation with local ATC and other persons or organisations involved in relevant LVP operations must regularly review the LVP to ensure their relevance and effectiveness.

[4] After section 10.18

insert

Section 10.19: Runway Visibility Assessments by Ground Personnel

10.19.1 Application

10.19.1.1 An aerodrome operator may appoint a person (the ***appointed RV assessor)*** to conduct runway visibility (***RV***) assessments at the aerodrome in accordance with this section.

10.19.1.2 Appointment of an RV assessor must be made in writing and the name of each assessor holding an appointment must be included in the aerodrome manual.

10.19.1.3 The appointed RV assessor must:

(a) before and after appointment — satisfy each of the requirements mentioned in subsection 10.19.3; and

(b) follow the procedures set out in subsection 10.19.4.

10.19.1.4 For subparagraph 120 (1) (b) of CAR 1988, the appointed RV assessor is approved by CASA for an operator or pilot in command of an aircraft to use the assessor's RV assessment to determine if the required visual reference for a landing, or the minimum take-off visibility, is likely to exist.

Note: Under regulation 120 of CAR 1988, among other things, the operator or pilot in command of an aircraft must not use a weather report of actual meteorological conditions in the planning, conduct and control of a flight if the meteorological observations or reports were not made with the authority of the Director of Meteorology or a person approved for the purpose by CASA.

10.19.2 Facilities and Procedures

10.19.2.1 For runway visibility assessments, the aerodrome operator must:

(a) establish a system for using visibility markers or counting runway lights (or both) for assessing runway visibility; and

(b) establish and mark fixed locations from which assessments are to be conducted; and

Note: These locations should be near the threshold or midpoint of the runway, such as the taxiway holding position for the taxiway adjoining the runway threshold, or at a point adjacent to the runway threshold, from which the distance to visibility markers is known.

(c) if runway markers are to be used:

(i) locate visibility markers to be representative of the runway conditions; and

(ii) locate visibility markers within 10 degrees of the runway centreline; and

(iii) provide visibility markers that:

(A) consist of dark objects of suitable dimension or lights of moderate intensity; and

(B) meet the standards of section 8.6.5 of MOS Part 139 for structural strength and frangibility; and

(d) produce a visibility markers chart that includes:

(i) the visibility markers used to assess runway visibility, showing their distances in metres and bearings from the point of observation; and

(ii) the identification of the day and night visibility markers in their proper positions by means of the designated symbols listed on the chart; and

(iii) the clear identification of the point of observation; and

(e) if assessments are made by counting runway lights, produce a conversion chart based on the actual spacing of the runway lights; and

(f) include in the aerodrome manual:

(i) the specific procedures for the conduct of runway visibility assessments at the aerodrome; and

(ii) the names of persons authorised to conduct runway visibility assessments.

10.19.3 Appointed Persons Conducting Runway Visibility Assessments

10.19.3.1 An appointed RV assessor must, before appointment, and at all time after appointment, have the following attributes and qualifications:

(a) a distant visual acuity of 6/12 or better in each eye separately and 6/9 or better binocular (with or without correcting lenses);

(b) a certificate of proficiency in aeronautical radio telephony;

(c) the competence to operate on the manoeuvring area of the aerodrome;

(d) demonstrated competence in the following:

(i) identifying the location of each point of observation;

(ii) identifying the visibility markers for each point of observation;

(iii) identifying the relevant runway edge lights for making a runway visibility assessment;

(iv) using the conversion table and the visibility markers chart;

(v) reporting a runway visibility assessment.

10.19.4 Procedures for Conducting a Runway Visibility Assessment

10.19.4.1 Runway visibility assessments must be conducted without using any optical devices to enhance normal distance vision.

10.19.4.2 The appointed RV assessor conducting the runway visibility assessment must:

(a) make the assessment from a nominated observation point; and

(b) carry out the observation by:

(i) establishing the farthest visible runway edge lights or visibility markers that can be seen and identified; and

(ii) determining the distance, in metres to the nearest 50 m increment, using the conversion table or the visibility markers chart; and

(iii) immediately reporting to the ATS facility that serves the aerodrome, if available, or to the person who requested the report, the RV along the specified runway in the following format:

RUNWAY VISIBILITY, RUNWAY [runway number], THRESHOLD [distance assessed in metres] {if applicable: MIDPOINT [distance assessed in metres]}, ASSESSED AT [time] UTC; and

(iv) if the RV varies during the assessment, report the lowest value observed; and

(c) not report any weather phenomena that are reducing the runway visibility unless he or she is authorised by the Director of Meteorology as a meteorological observer, or approved for the purpose by CASA; and

Note: Authority to give weather reports requires an authorisation or approval, additional to that mentioned in paragraph 10.19.1.4 — see regulation 120 of CAR 1988.

Notes:

1. The term ***optical devices*** does not include spectacles or contact lenses that the person usually wears for normal distance vision.
2. As far as practicable, observations should not be made through a window during day time or particularly at night.

(d) limit reports to the following range of values:

(i) lowest limit — 350 m; and

(ii) upper limit — 1500 m.

Note: Where the runway visibility is below 350 m, the runway visibility should be reported as "less than 350 m".

10.19.4.3 An RV assessment may only be provided to a pilot if the assessment was conducted within the previous 20 minutes.
