



REPUBLIC OF LEBANON
MINISTRY OF PUBLIC WORKS AND
TRANSPORT
DIRECTORATE GENERAL OF CIVIL AVIATION

LARs

LEBANESE AVIATION REGULATIONS

Part III **Aerodrome Licensing**

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SUBPART 301

Part III of the Lebanese Aviation Regulations is issued by the Lebanese Civil Aviation Authority (LCAA) in pursuit of its obligations to ensure compliance to ICAO requirements of accepted international regulations and standards at aerodromes in Lebanon and to follow up their execution.

GENERAL

Part III of the Lebanese Aviation Regulations is issued by the Directorate General of Civil Aviation in pursuit of its obligations to ensure enforcement of accepted international regulations and standards at aerodromes in Lebanon and to follow up their execution.

301.1 DEFINITIONS

301.1.1 The use of the word "**shall**" in these regulations means the requirement is mandatory.

301.1.2 The use of the word "**should**" in these regulations means that the requirement is mandatory unless safety arguments for variations can be presented and agreed.

301.1.3 The use of the word "**Security**" in these regulations relates to aerodrome licensing requirements. Aviation security is an integral part of aerodrome planning and operations.
This Part contains several specifications aimed at enhancing the level of security at aerodromes.

301.1.4 The terms described below shall have the following meaning whenever they appear in these regulations:

Accuracy: A degree of conformance between the estimated or measured value and the true value.

Aerodrome: A defined area on land (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome beacon: Aeronautical beacon used to indicate the location of an aerodrome from the air.

Aerodrome elevation: The elevation of the highest point of the landing area.

Aerodrome facilities and equipment: Facilities and equipment inside or outside the boundaries of an aerodrome that are constructed or installed and maintained for the arrival, departure and surface movement of aircraft.

Aerodrome license: A license issued by the appropriate authority under applicable regulations for the operation of an aerodrome.

Aerodrome Manual: A manual included in an application for an aerodrome license pursuant to these regulations and includes any amendments to the manual accepted by the Authority.

Aerodrome operator: In relation to a licensed aerodrome, the aerodrome license holder.

Aerodrome reference point: The designated geographical location of an aerodrome.

Aerodrome traffic density:

- a) Light. Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements.
- b) Medium. Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements.
- c) Heavy. Where the number of movements in the mean busy hour is of the order of 26 or more per runway or typically more than 35 total aerodrome movements.

Aeronautical beacon: An aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the earth.

Aeronautical ground light: Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

Aeroplane reference field length: The minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certificating authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

Aircraft classification number (ACN): A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

Aircraft stand: A designated area on an apron intended to be used for parking an aircraft.

Apron: A defined area on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading of passengers, mail or cargo, fuelling, parking or maintenance.

Apron management service: A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

Authority: The Directorate General of Civil Aviation.

Barrette: Three or more aeronautical ground lights closely spaced in a transverse line so that from a distance they appear as a short bar of light.

Calendar: Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108)

Capacitor discharge light: A lamp in which high-intensity flashes of extremely short duration are produced by the discharge of electricity at high voltage through a gas enclosed in a tube.

Clearway: A defined rectangular area on the ground or water under the control of the appropriate authority selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

Cyclic redundancy check (CRC): A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

Data quality: A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution and integrity.

Datum: Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities.

Declared distances:

- a) Take-off run available (TORA). The length of runway declared available and suitable for the ground run of an aeroplane taking off.
- b) Take-off distance available (TODA). The length of the take-off run available plus the length of the clearway, if provided.
- c) Accelerate-stop distance available (ASDA). The length of the take-off run available plus the length of the stopway, if provided.
- d) Landing distance available (LDA). The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Displaced threshold: A threshold not located at the extremity of a runway.

Effective intensity: The effective intensity of a flashing light is equal to the intensity of a fixed light of the same colour which will produce the same visual range under identical conditions of observation.

Ellipsoid height (Geodetic height): The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Fixed light: A light having constant luminous intensity when observed from a fixed point.

Frangible object: An object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

Geodetic datum: A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

Geoid: The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

Geoid undulation: The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

Gregorian calendar: Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108).

Hazard beacon: An aeronautical beacon used to designate a danger to air navigation

Heliport: An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Holding bay: A defined area where aircraft can be held, or bypassed, to facilitate efficient surface movement of aircraft.

Human Factors principles: Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Human performance: Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

Identification beacon: An aeronautical beacon emitting a coded signal by means of which a particular point of reference can be identified.

Instrument runway: One of the following types of runways 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 I. An instrument runway served by ILS and/or MLS and visual aids intended for operations with a decision height not lower than 60 m (200 ft) and either a visibility not less than 800 m or a runway visual range not less than 550 m.
- c) Precision approach runway, category II. An instrument runway served by ILS and/or MLS 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 a runway visual range not less than 350 m.
- d) Precision approach runway, category III. An instrument runway served by ILS and/or MLS to and along the surface of the runway and:

- A — intended for operations with a decision height lower than 30 m (100 ft), or no decision height and a runway visual range not less than 200 m.
- B — intended for operations with a decision height lower than 15 m (50 ft), or no decision height and a runway visual range less than 200 m but not less than 50 m.
- C — intended for operations with no decision height and no runway visual range limitations.

Integrity (aeronautical data): A degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

Intermediate holding position: A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower.

International aerodrome Any aerodrome designed by the state in its territory for the arrival and departure of international air traffic, and where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

Landing area: That part of a movement area intended for the landing or take-off of aircraft.

Laser-beam critical flight zone (LCFZ): Airspace in the proximity of an airdrome but beyond the LFFZ where the irradiance is restricted to a level unlikely to cause glare effects.

Laser-beam free flight zone (LFFZ): Airspace in the immediate proximity to the aerodrome where the irradiance is restricted to a level unlikely to case any visual disruption.

Laser-beam sensitive flight zone (LSFZ): Airspace outside and not necessarily contiguous with, the LFFZ and LCFZ where the irradiance is restricted to a level unlikely to cause flash-blindness or after-image effects.

Licensed aerodrome: An aerodrome whose operator has been granted an aerodrome license.

Lighting system reliability: The probability that the complete installation operates within the specified tolerances and that the system is operationally usable.

Manoeuvring area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Marker: An object displayed above ground level in order to indicate an obstacle or delineate a boundary.

Marking: A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.

Movement area: That part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

Near-parallel runways: Non-intersecting runways whose extended centre lines have an angle of convergence/divergence of 15 degrees or less.

Non-instrument runway: A runway intended for the operation of aircraft using visual approach procedures.

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.

Normal flight zone (NFZ): Airspace not defined as LFFZ, LCFZ or LSFZ but which must be protected from laser radiation capable of causing biological damage to the eye.

Obstacle: All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

Obstacle free zone (OFZ): In relation to an aerodrome means the airspace above the inner approach surface, inner transitional surfaces, the balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

Obstacle limitations surfaces: A series of surfaces that define the volume of airspace at and around an aerodrome to be kept free of obstacles in order to permit the intended aeroplane operations to be conducted safely and to prevent the aerodrome from becoming unusable by the growth of obstacles around the aerodrome.

Orthometric height: Height of a point related to the geoid, generally presented as an MSL elevation.

Pavement classification number (PCN): A number expressing the bearing strength of a pavement for unrestricted operations.

Precision approach runway, see **Instrument runway.**

Primary runway(s): Runway(s) used in preference to others whenever conditions permit.

Protected flight zones: Airspace specifically designated to mitigate the hazardous effects of laser radiation.

Road: An established surface route on the movement area meant for the exclusive use of vehicles.

Road-holding position: A designated position at which vehicles may be required to hold.

Runway: A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway end safety area (RESA): An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

Runway guard lights: A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.

Runway-holding position: A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/ MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.

Note. - In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.

Runway strip: means a defined area including the runway and stopway if provided, intended:

- a) To reduce the risk of damage to aircraft running off a runway; and
- b) To protect aircraft flying over it during take-off or landing operations.

Runway turn pad: A defined area on a land aerodrome adjacent to a runway for the purpose of completing a 180-degree turns on a runway.

Runway visual range (RVR): The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

Safety management system: A system for the management of safety at aerodromes including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.

Shoulder: An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.

Sign:

- a) Fixed message sign. A sign presenting only one message.
- b) Variable message sign. A sign capable of presenting several pre-determined messages no message, as applicable.

Signal area: An area on an aerodrome used for the display of ground signals.

Station declination: An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

Stopway: A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

Switch-over time (light): The time required for the actual intensity of a light measured in a given direction to fall from 50 per cent and recover to 50 per cent during a power supply changeover, when the light is being operated at intensities of 25 per cent or above.

Take-off runway: A runway intended for take-off only.

Taxiway: A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

- a) Aircraft stand taxi lane. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.
- b) Apron taxiway. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.
- c) Rapid exit taxiway. A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

Taxiway intersection: A junction of two or more taxiways.

Taxiway strip: An area including a taxiway intended to protect an aircraft operating on a taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.

Threshold: The beginning of that portion of the runway usable for landing.

Touchdown zone: The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

Unserviceable area: A part of the movement area that is unfit and unavailable for use by aircraft.

Usability factor: The percentage of time during which the use of a runway or system of runways is not restricted because of the cross-wind component.

Work area A part of an aerodrome in which maintenance or construction works are in progress.

301.2 APPLICABILITY

301.2.1 The interpretation of some of the specifications in this Part expressly requires the exercising of discretion, the taking of a decision or the performance of a function by the appropriate authority. In other specifications, the expression appropriate authority does not actually appear although its inclusion is implied. In both cases, the responsibility for whatever determination or action is necessary shall rest with the State having jurisdiction over the aerodrome.

301.2.2 The specifications, unless otherwise indicated in a particular context, shall apply to all aerodromes open to public use in accordance with the requirements of the Lebanese Aviation Law. The specifications of Chapter 5 of this Part shall apply only to land aerodromes. The specifications in this Part shall apply, where appropriate, to heliports but shall not apply to stolports.

301.2.3 Wherever a colour is referred to in this Part, the specifications for that colour given in ICAO Annex 14 Aerodromes, volume I, Appendix 1 shall apply.

301.2.4 The regulations and specifications contained within LARs Part III are based upon ICAO standards, recommended practices of Annex 14, Volume 1, guidance material and international best practice.

301.2.5 The following ICAO Manuals can be consulted or reviewed for any related specification mentioned in the following Aerodrome Licensing regulations.

Aerodrome Design Manual (Doc 9157)

- Part 1 — Runways
- Part 2 — Taxiways, Aprons and Holding Bays
- Part 3 — Pavements
- Part 4 — Visual Aids
- Part 5 — Electrical Systems
- Part 6 — Frangibility (in preparation)

Airport Planning Manual (Doc 9184)

- Part 1 — Master Planning
- Part 2 — Land Use and Environmental Control
- Part 3 — Guidelines for Consultant/Construction Services

Airport Services Manual (Doc 9137)

- Part 1 — Rescue and Fire Fighting
- Part 2 — Pavement Surface Conditions
- Part 3 — Bird Control and Reduction
- Part 4 — Fog Dispersion (withdrawn)
- Part 5 — Removal of Disabled Aircraft
- Part 6 — Control of Obstacles
- Part 7 — Airport Emergency Planning
- Part 8 — Airport Operational Services
- Part 9 — Airport Maintenance Practices

Heliport Manual (Doc 9261)

Stolport Manual (Doc 9150)

Manual on the ICAO Bird Strike Information System (IBIS) (Doc 9332)

Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476)

Manual on Certification of Aerodromes (Doc 9774)

Human Factors Training Manual (Doc 9683)

301.3 Common reference systems

301.3.1 **Horizontal reference system:** World Geodetic System – 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system. Reported aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

301.3.2 **Vertical reference system:** Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to surface known as the geoid, shall be used as the vertical reference system.

Note1. – The geoid globally most closely approximates MSL. It is defined as the equipotential surface in the gravity field of the Earth which coincides with the undisturbed MSL extended continuously through the continents.

Note2. - Gravity-related heights (elevations) are also referred to as Orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

301.3.3 Temporal reference system

301.3.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system.

301.3.3.2 When a different temporal reference system is used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP).

301.4 Airport design

Architectural and infrastructure-related for the optimum implementation of international civil aviation security measures shall be international civil aviation security measures shall be integrated into the design and construction of new facilities and alterations to existing facilities at an aerodrome.

301.5 Reference code

301.5.1 An aerodrome reference code — code number and letter — which is selected for aerodrome planning purposes shall be determined in accordance with the characteristics of the aeroplane for which an aerodrome facility is intended.

301.5.2 The aerodrome reference code numbers and letters shall have the meanings assigned to them in Table 1-1.

301.5.3 The code number for element 1 shall be determined from Table 1-1, column 1, selecting the code number corresponding to the highest value of the aeroplane reference field lengths of the aeroplanes for which the runway is intended.

310.5.4 The code letter for element 2 shall be determined from Table 1-1, column 3, by selecting the code letter which corresponds to the greatest wing span, or the greatest outer main gear wheel span, whichever gives the more demanding code letter of the aeroplanes for which the facility is intended.

Table 1-1. Aerodrome reference code				
Code element 1		Code element 2		
Code number (1)	Aeroplane reference field length (2)	Code letter (3)	Wing span (4)	Outer main gear wheel span ^a (5)
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1 200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1 200 m up to but not including 1 800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1 800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80 m	14 m up to but not including 16 m
a. Distance between the outside edges of the main gear wheels.				

- END -

SUBPART 302

LICENSING PROCESS

302.1 REQUIREMENT OF THE AERODROME LICENSE

- 302.1.1 With effect from 1/1/2006, an operator of an aerodrome used for international operations shall be in possession of an aerodrome license.
- 302.1.2 The Authority should certify aerodromes open to public use in accordance with these specifications as well as other relevant ICAO specifications through an appropriate regulatory framework.
- 302.1.3 The LARs Part III are the regulatory framework which include the establishment of criteria for the licensing of aerodromes.
- 302.1.4 An application for an aerodrome license shall be submitted to the Authority, no later than 1/12/2005, for approval in a form prescribed by the Authority, and the application shall include the Aerodrome Manual for the aerodrome. As part of the licensing process, the Authority shall ensure that an aerodrome manual which will include all pertinent information on the aerodrome site, facilities, services, equipment, operating procedures, organization and management including a safety management system, is submitted by the applicant for approval prior to granting the aerodrome license.

302.2 GRANT OF THE AERODROME LICENSE

- 302.2.1 Subject to the provisions in 302.2.2 the Authority may approve the application and accept the Aerodrome Manual submitted under 302.1.4 and grant an aerodrome license to the applicant.
- 302.2.2 Before granting an aerodrome license, the Authority must be satisfied that:
- a) The applicant and his staff have the necessary competence and experience to operate and maintain the aerodrome properly;
 - b) The Aerodrome Manual prepared for the applicant's aerodrome; and submitted with the application contains all the relevant information;
 - c) The aerodromes facilities, services and equipment are in accordance with the standards and practices specified by the Authority;
 - d) The aerodrome's operating procedures make satisfactory provision for the safety of aircraft; and
 - e) An acceptable safety management system is in place at the aerodrome.
- 302.2.3 The Authority may refuse to grant an aerodrome license to an applicant. In such cases the Authority must notify the applicant, in writing, of its reasons no later than 30 days after making that decision.
- 302.2.4 After a successful completion of the processing of the application and the inspection of the aerodrome, the Authority, while granting the aerodrome license, may endorse the conditions for the type of use of the aerodrome and other details as shown in the license (Appendix 3).

302.3 VALIDITY OF THE AERODROME LICENSE

302.3.1 The validity of the license is based upon the physical characteristics, type of use of the aerodrome and continued operation in accordance with LARs Part III Aerodrome Licensing Regulations. Any change which is not approved by the Authority shall invalidate the license.

302.3.2 Normally, the aerodrome license shall be valid for 5 years or until it is suspended or cancelled, whichever is earlier.

302.3.3 An aerodrome license holder must give the Authority not less than 3 months written notice of the date on which the license is to be surrendered in order that suitable promulgation action can be taken. The Authority will cancel the license on the date specified in the notice.

302.3.4 The Authority may approve, and issue an instrument of transfer of an aerodrome license to a transferee when:

- a) The current holder of the aerodrome license notifies the Authority in writing at least 3 months before ceasing to operate the aerodrome, that the current holder will cease to operate the aerodrome as of the date specified in the notice;
- b) The current holder of the aerodrome license notifies the Authority, in writing, of the name of the transferee;
- c) The transferee applies in writing to the Authority within 3 months before the current holder of the aerodrome license ceases to operate the aerodrome, for the aerodrome license to be transferred to the transferee; and
- d) The requirements set out in 302.2.2 are met in respect of the transferee.

If the Authority does not consent to the transfer of an aerodrome license, it shall notify the transferee, in writing, of its reasons no later than 30 days after making that decision.

302.3.5 The Authority may issue an interim aerodrome license to an applicant or a proposed transferee of the aerodrome license authorizing the applicant or transferee to operate an aerodrome if the Authority is satisfied that:

- a) An aerodrome license in respect of the aerodrome will be issued to the applicant or transferred to the transferee as soon as the application procedure in respect of the grant or transfer is completed; and
- b) The grant of the interim license is in the public interest and is not detrimental to aviation safety.

302.3.6 An interim aerodrome license issued pursuant to regulation 302.3.5 shall expire on the earlier of:

- a) The date on which the aerodrome license is issued or transferred; or
- b) The expiry date specified in the interim aerodrome license.

302.3.7 These regulations apply to an interim aerodrome license in the same manner as they apply to an aerodrome license.

302.4 AMENDMENT OF THE AERODROME LICENSE

302.4.1 The Authority may, provided that the requirements of 302.2.2 and 303.6 are met, amend an aerodrome license where:

- a) There is a change in the ownership/management of the aerodrome; or
- b) There is a change in the use or operation of the aerodrome; or
- c) There is a change in the boundaries of the aerodrome; or
- d) The holder of the aerodrome license requests the amendment.

302.5 AERONAUTICAL DATA

302.5.1 Determination and reporting of aerodrome related aeronautical data shall be in accordance with the accuracy and integrity requirements set forth in Tables 1 to 5 contained in ICAO Annex 14 Volume I Appendix 5 while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based upon a 95 per cent confidence level and in that respect, three types of positional data shall be identified: surveyed points (e.g. runway threshold), calculated points (mathematical calculations from the known surveyed points of points in space, fixes) and declared points (e.g. flight information region boundary points).

302.5.2 The Authority shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classification and data integrity level shall apply:

- a) critical data, integrity level 1×10^{-8} : there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) essential data, integrity level 1×10^{-5} : there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) routine data, integrity level 1×10^{-3} : there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

302.5.3 Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the cyclic redundancy check (CRC). To achieve protection of the integrity level of critical and essential aeronautical data as classified in 302.5.2 above, a 32 or 24 bit CRC algorithm shall apply respectively.

302.5.4 To achieve protection of the integrity level of routine aeronautical data as classified in 302.5.2 above, a 16 bit CRC algorithm should apply.

302.5.5 Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information services authority in terms of the World Geodetic System — 1984 (WGS-84) geodetic reference datum, identifying those geographical coordinates which have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the requirements in ICAO Annex 14 Volume I Appendix 5.

302.5.6 The order of accuracy of the field work shall be such that the resulting operational navigation data for the phases of flight will be within the maximum deviations, with respect to an appropriate reference frame, as indicated in tables contained in Appendix 8.

302.5.7 In addition to the elevation (referenced to mean sea level) of the specific surveyed ground positions at aerodromes, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions as indicated in ICAO Annex 14 Volume I Appendix 5 shall be determined and reported to the aeronautical information services authority.

302.6 AERODROME REFERENCE POINT

302.6.1 An aerodrome reference point shall be established for an aerodrome.

302.6.2 The aerodrome reference point shall be located near the initial or planned geometric centre of the aerodrome and shall normally remain where first established.

302.6.3 The position of the aerodrome reference point shall be measured and reported to the aeronautical information services authority in degrees, minutes and seconds.

302.7 AERODROME AND RUNWAY ELEVATIONS

302.7.1 The aerodrome elevation and geoid undulation at the aerodrome elevation position shall be measured to the accuracy of one-half metre or foot and reported to the aeronautical information services authority.

302.7.2 For an aerodrome used by international civil aviation for non-precision approaches, the elevation and geoid undulation of each threshold, the elevation of the runway end and any significant high and low intermediate points along the runway shall be measured to the accuracy of one-half metre or foot and reported to the aeronautical information services authority.

302.7.3 For precision approach runway, the elevation and geoid undulation of the threshold, the elevation of the runway end and the highest elevation of the touchdown zone shall be measured to the accuracy of one-quarter metre or foot and reported to the aeronautical information services authority.

302.8 AERODROME REFERENCE TEMPERATURE

302.8.1 An aerodrome reference temperature shall be determined for an aerodrome in degrees Celsius.

302.8.2 The aerodrome reference temperature should be the monthly mean of the daily maximum temperatures for the hottest month of the year (the hottest month being that which has the highest monthly mean temperature). This temperature should be averaged over a period of years.

302.9 AERODROME DIMENSIONS AND RELATED INFORMATION

302.9.1 The following data shall be measured or described, as appropriate, for each facility provided on an aerodrome:

- a) runway — true bearing to one-hundredth of a degree, designation number, length, width, displaced threshold location to the nearest metre or foot, slope, surface type, type of runway and, for a precision approach runway category I, the existence of an obstacle free zone when provided;

- b) strip
runway end safety area } Length, width to the nearest metre or foot, surface type;
stopway
- c) taxiway — designation, width, surface type;
- d) apron — surface type, aircraft stands;
- e) the boundaries of the air traffic control service;
- f) clearway — length to the nearest metre or foot, ground profile;
- g) visual aids for approach procedures, marking and lighting of runways, taxiways and aprons, other visual guidance and control aids on taxiways and aprons, including taxi-holding positions and stopbars, and location and type of visual docking guidance systems;
- h) location and radio frequency of any VOR aerodrome check-point;
- i) location and designation of standard taxi-routes; and
- j) distances to the nearest metre or foot of localizer and glide path elements comprising an instrument landing system (ILS) or azimuth and elevation antenna of microwave landing system (MLS) in relation to the associated runway extremities.

302.9.2 The geographical coordinates of each threshold shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

302.9.3 The geographical coordinates of appropriate taxiway centre line points shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

302.9.4 The geographical coordinates of each aircraft stand shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

302.9.5 The geographical coordinates of significant obstacles in the approach and take-off areas, in the circling area and in the vicinity of an aerodrome shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation rounded up to the nearest metre or foot, type, marking and lighting (if any) of the significant obstacles shall be reported to the aeronautical information services authority.

302.10 STRENGTH OF PAVEMENTS

302.10.1 The bearing strength of a pavement shall be determined.

302.10.2 The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg shall be made available using the aircraft classification number — pavement classification number (ACN-PCN) method by reporting all of the following information:

- a) the pavement classification number (PCN);
- b) pavement type for ACN-PCN determination;

- c) subgrade strength category;
- d) maximum allowable tire pressure category or maximum allowable tire pressure value; and
- e) evaluation method.

302.10.3 The pavement classification number (PCN) reported shall indicate that an aircraft with an aircraft classification number (ACN) equal to or less than the reported PCN can operate on the pavement subject to any limitation on the tire pressure, or aircraft all-up mass for specified aircraft type(s).

302.10.4 The ACN of an aircraft shall be determined in accordance with the standard procedures associated with the ACN-PCN method.

302.10.5 For the purposes of determining the ACN, the behaviour of a pavement shall be classified as equivalent to a rigid or flexible construction.

302.10.6 Information on pavement type for ACN-PCN determination, subgrade strength category, maximum allowable tire pressure category and evaluation method shall be reported using the following codes:

- a) Pavement type for ACN-PCN determination:

	Code
Rigid pavement	R
Flexible pavement	F

- b) Subgrade strength category:

	Code
High strength: characterized by $K = 150\text{MN/m}^3$ and representing all K values above 120MN/m^3 for rigid pavements, and by $\text{CBR} = 15$ and representing all CBR values above 13 for flexible pavements.	A
Medium strength: characterized by $K = 80\text{MN/m}^3$ and representing a range in K of 60 to 120MN/m^3 for rigid pavements, and by $\text{CBR} = 10$ and representing a range in CBR of 8 to 13 for flexible pavements.	B
Low strength: characterized by $K = 40\text{MN/m}^3$ and representing a range in K of 25 to 60MN/m^3 for rigid pavements, and by $\text{CBR} = 6$ and representing a range in CBR of 4 to 8 for flexible pavements.	C
Ultra low strength: characterized by $K = 20\text{MN/m}^3$ and representing all K values below 25MN/m^3 for rigid pavements, and by $\text{CBR} = 3$ and representing all CBR values below 4 for flexible pavements.	D

- c) Maximum allowable tire pressure category:

	Code
High: no pressure limit	W
Medium: pressure limited to 1.50 MPa	X

Low: pressure limited to 1.00 MPa	Y
Very low: pressure limited to 0.50 MPa	Z
d) Evaluation method:	Code
Technical evaluation: representing a specific study of the pavement characteristics and application of pavement behaviour technology.	T
Using aircraft experience: representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.	U

Example 1.—If the bearing strength of a rigid pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN 80 and there is no tire pressure limitation, then the reported information would be:

PCN 80 / R / B / W / T

Example 2.—If the bearing strength of a composite pavement, behaving like a flexible pavement and resting on a high strength subgrade, has been assessed by using aircraft experience to be PCN 50 and the maximum tire pressure allowable is 1.00 MPa, then the reported information would be:

PCN 50 / F / A / Y / U

Example 3.—If the bearing strength of a flexible pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN 40 and the maximum allowable tire pressure is 0.80 MPa, then the reported information would be:

PCN 40 / F / B / 0.80 MPa / T

302.10.7 Criteria should be established to regulate the use of a pavement by an aircraft with an ACN higher than the PCN reported for that pavement in accordance with 302.10.2 and 302.10.3.

302.10.8 The bearing strength of a pavement intended for aircraft of apron (ramp) mass equal to or less than 5 700 kg shall be made available by reporting the following information:

- a) maximum allowable aircraft mass; and
- b) maximum allowable tire pressure.
Example: 4 000 kg/0.50 MPa.

302.11 PRE-FLIGHT ALTIMETER CHECK LOCATION

302.11.1 One or more pre-flight altimeter check locations shall be established for an aerodrome.

302.11.2 A pre-flight check location should be located on an apron.

302.11.3 The elevation of a pre-flight altimeter check location shall be given as the average elevation, rounded to the nearest metre or foot, of the area on which it is located. The elevation of any portion

of a pre-flight altimeter check location shall be within 3 m (10 ft) of the average elevation for that location.

302.12 DECLARED DISTANCES

The following distances shall be calculated to the nearest metre or foot for a runway intended for use by international commercial air transport:

- a) take-off run available;
- b) take-off distance available;
- c) accelerate-stop distance available; and
- d) landing distance available.

302.13 CONDITION OF THE MOVEMENT AREA AND RELATED FACILITIES

302.13.1 Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information service units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

302.13.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports on matters of operational significance or affecting aircraft performance given, particularly in respect of the following:

- a) construction or maintenance work;
- b) rough or broken surfaces on a runway, a taxiway or an apron;
- c) water on a runway, a taxiway or an apron;
- d) snow banks or drifts adjacent to a runway, a taxiway or an apron;
- e) other temporary hazards, including parked aircraft;
- f) failure or irregular operation of part or all of the aerodrome visual aids; and
- g) failure of the normal or secondary power supply.

302.13.3 To facilitate compliance with 302.9.1 and 302.9.2 inspections of the movement area should be carried out each day at least once where the code number is 1 or 2 and at least twice where the code number is 3 or 4.

Water on a runway

302.13.4 Whenever water is present on a runway, a description of the runway surface conditions on the centre half of the width of the runway, including the possible assessment of water depth, where applicable, should be made available using the following terms:

DAMP — the surface shows a change of colour due to moisture.

WET — the surface is soaked but there is no standing water.

WATER PATCHES — significant patches of standing water are visible.

FLOODED — extensive standing water is visible.

302.13.5 Information that a runway or portion thereof may be slippery when wet shall be made available.

302.13.6 A runway or portion thereof shall be determined as being slippery when wet when the measurements specified in 10.302.3 show that the runway surface friction characteristics as measured by a continuous friction measuring device are below the minimum friction level specified by the State.

302.13.7 Information on the minimum friction level specified by the State for reporting slippery runway conditions and the type of friction measuring device used shall be made available.

302.13.8 When it is suspected that a runway may become slippery under unusual conditions, then additional measurements should be made when such conditions occur, and information on the runway surface friction characteristics made available when these additional measurements show that the runway or a portion thereof has become slippery.

302.14 DISABLED AIRCRAFT REMOVAL

302.14.1 The telephone/telex number(s) of the office of the aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area should be made available, on request, to aircraft operators.

302.14.2 Information concerning the capability to remove an aircraft disabled on or adjacent to the movement area should be made available.

302.15 RESCUE AND FIRE FIGHTING

302.15.1 Information concerning the level of protection provided at an aerodrome for aircraft rescue and fire fighting purposes shall be made available.

302.15.2 The level of protection normally available at an aerodrome should be expressed in terms of the category of the rescue and fire fighting services as described in 9.2 and in accordance with the types and amounts of extinguishing agents normally available at the aerodrome.

302.15.3 Significant changes in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly.

302.15.4 A significant change should be expressed in terms of the new category of the rescue and fire fighting service available at the aerodrome.

302.16 VISUAL APPROACH SLOPE INDICATOR SYSTEMS

The following information concerning a visual approach slope indicator system installation shall be made available:

- a) associated runway designation number;

- b) type of system according to 7.3.5.302. For an AT-VASIS, PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, shall be given;
- c) where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right shall be indicated;
- d) nominal approach slope angle(s). For a T-VASIS or an AT-VASIS this shall be angle according to the formula in Figure 7-12 and for a PAPI and an APAPI this shall be angle $(B + C) \div 2$ and $(A + B) \div 2$, respectively as in Figure 7-14; and
- e) minimum eye height(s) over the threshold of the on-slope signal(s). For a T-VASIS or an AT-VASIS this shall be the lowest height at which only the wing bar(s) are visible; however, the additional heights at which the wing bar(s) plus one, two or three fly down light units come into view may also be reported if such information would be of benefit to aircraft using the approach. For a PAPI this shall be the setting angle of the third unit from the runway minus 2', i.e. angle B minus 2', and for an APAPI this shall be the setting angle of the unit farther from the runway minus 2', i.e. angle A minus 2'.

302.17 COORDINATION BETWEEN AERONAUTICAL INFORMATION SERVICES AND AERODROME AUTHORITIES

302.17.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report to the responsible aeronautical information services unit, with a minimum of delay:

- a) information on aerodrome conditions;
- b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
- c) any other information considered to be of operational significance.

302.17.2 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by the aeronautical information service for the preparation, production and issue of relevant material for promulgation. To ensure timely provision of the information to the aeronautical information service, close coordination between those services concerned is therefore required.

302.17.3 Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system. The predetermined, internationally agreed AIRAC effective dates in addition to 14 days postage time shall be observed by the responsible aerodrome services when submitting the raw information/data to aeronautical information services.

302.17.4 The aerodrome services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall do that while taking into account accuracy and integrity requirements for aeronautical data as specified in ICAO Annex 14 Volume I Appendix 5.

- END -

SUBPART 303

AERODROME MANUAL

303.1 PURPOSE AND SCOPE

- 303.1.1 The Aerodrome Manual is a fundamental requirement of the licensing process. It shall contain all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management including the safety management system. The information presented in the Aerodrome Manual shall demonstrate that the aerodrome conforms to the license standards and practices and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
- 303.1.2 The Aerodrome Manual is a reference document and provides a checklist of aerodrome license standards to be maintained and the level of airside services at the aerodrome. Information provided in the Aerodrome Manual will enable the Authority to assess the suitability of the aerodrome for the aircraft operations proposed. It is the basic reference guide for conducting site inspections for granting an aerodrome license and for subsequent safety inspections. The Aerodrome Manual shall be produced by the aerodrome operator and requires approval by the Authority with respect to the standards, conditions and the levels of services to be maintained at the aerodrome.
- 303.1.3 The Aerodrome Manual is subject to amendments, in order to ensure that it provides current and accurate information at all times. The aerodrome license holder is responsible in this respect and also for submitting amendment requests to the Authority.

303.2 PREPARATION OF THE MANUAL

- 303.2.1 The operator of a licensed aerodrome shall have a manual, to be known as the Aerodrome Manual, for the aerodrome.
- 303.2.2 The Aerodrome Manual shall:
- a) Be type written or printed and signed by the aerodrome operator;
 - b) Be in a format that is easy to revise;
 - c) Have a system for recording the currency of pages and amendments, thereto, and should include a page for logging revisions; and
 - d) Be organised in a manner that will facilitate the preparation, review and approval process.

303.3 LOCATION OF THE MANUAL

- 303.3.1 The aerodrome operator shall provide the Authority with two complete and current copies of the Aerodrome Manual.
- 303.3.2 The aerodrome operator shall keep at least one complete and current copy of the Aerodrome Manual at the aerodrome and one copy at the operator's principal place of business, if different from the aerodrome.
- 303.3.3 The Aerodrome operator shall make the Aerodrome Manual available to all relevant aerodrome personnel and for inspection by the Authority.

303.4 INFORMATION TO BE INCLUDED IN THE MANUAL

303.4.1 The operator of a licensed aerodrome shall include the following particulars in an Aerodrome Manual; to the extent these are applicable to the aerodrome, under the following parts (see Appendix 1 – Schedule of Aerodrome Licensing Regulations):

303.4.2 Part 1: General information as set out in Part 1 of the Schedule.

303.4.3 Part 2: Particulars of the aerodrome site as set out in Part 2 of the Schedule.

303.4.4 Part 3: Particulars of the aerodrome required to be reported to the Aeronautical Information Service as set out in Part 3 of the Schedule.

303.4.5 Part 4: The aerodrome operating procedures and safety measures as set out in Part 4 of the Schedule.

303.4.6 Part 5: Details of the aerodrome administration and the Safety Management System established for the aerodrome as set out in Part 5 of the Schedule.

303.4.7 If a particular is not included in the Aerodrome Manual because it is not applicable to the aerodrome, the aerodrome operator must state in the manual the reason for non-applicability of the particular.

303.5 AMENDMENT OF THE AERODROME MANUAL

303.5.1 The operator of a licensed aerodrome shall amend the Aerodrome Manual, whenever necessary, in order to maintain the accuracy of the information in the manual and the validity of the Aerodrome License.

303.5.2 To maintain the accuracy of the Aerodrome Manual, the Authority may issue a written directive to an aerodrome operator requiring the operator to alter or amend the manual in accordance with that directive.

303.5.3 An aerodrome operator must submit an amendment request to the Authority as soon as practicable, of any changes that the operator wishes to make to the Aerodrome Manual.

303.6 AUTHORITY APPROVAL OF THE AERODROME MANUAL

The Authority shall approve the Aerodrome Manual and any amendment thereto, provided these meet the requirements of the preceding regulations in this section.

- END -

SUBPART 304

OBLIGATIONS OF THE AERODROME OPERATOR

304.1 GENERAL

304.1.1 The grant of an aerodrome license obliges the aerodrome operator to ensure safety, regularity and efficiency of operations at the aerodrome; to allow personnel authorized by the Authority access to the aerodrome to carry out safety audits, inspections and testing, and to be responsible for notifying and reporting as prescribed.

304.2 COMPLIANCE WITH STANDARDS AND PRACTICES

304.2.1 The aerodrome operator shall comply with the standards and practices specified in LARs Part III and with any conditions endorsed in the license pursuant to 2.2.304.

304.3 COMPETENCE OF OPERATIONAL AND MAINTENANCE PERSONNEL

304.3.1 The aerodrome operator shall employ adequate number of qualified and skilled personnel for performing all critical activities in the aerodrome operations and maintenance processes.

304.3.2 Where the Authority has prescribed a competency certification requirement for the personnel referred to in 304.3.1, the aerodrome operator shall employ only those persons possessing such certificates.

304.3.3 The aerodrome operator shall implement a programme to upgrade the competency of the personnel referred to in 304.3.1

304.4 AERODROME OPERATION AND MAINTENANCE

304.4.1 Subject to any directive that the Authority may issue, the aerodrome operator shall operate and maintain the aerodrome in accordance with the procedures set out in the Aerodrome Manual.

304.4.2 To ensure the safety of aircraft, the Authority may give written directives to an aerodrome operator to alter the procedures set out in the Aerodrome Manual.

304.4.3 The aerodrome operator shall ensure proper and efficient maintenance of the aerodrome facilities.

304.5 SAFETY MANAGEMENT SYSTEM

304.5.1 The aerodrome operator shall establish a safety management system for the aerodrome describing the structure of the organization and the duties, powers and responsibilities of the officials in the organizational structure, with a view to ensuring that operations are carried out in a demonstrably controlled way and are improved where necessary.

304.5.2 The aerodrome operator shall oblige all the users of the aerodrome including fixed-base operators, ground handling agencies and other organizations which perform activities independently at the aerodrome in relation to flight or aircraft handling, to comply with the requirements laid down by the aerodrome operator with regard to safety and order at the aerodrome, and shall monitor such compliance.

304.5.3 The aerodrome operator shall require all the users of the aerodrome including fixed-base operators, ground handling agencies and other organizations referred to in 304.5.2, to cooperate in the programme to promote safety and order at, and the safe use of, the aerodrome by immediately informing it of any accident, incident, defect and fault which have a bearing on safety.

304.6 INTERNAL SAFETY AUDITS AND SAFETY REPORTING

304.6.1 The aerodrome operator shall arrange for an internal audit of the safety management system, including an inspection of the aerodrome facilities and equipment. The audit shall cover the aerodrome operator's own functions. The aerodrome operator shall also arrange an external audit and inspection programme for evaluation of other users including fixed-base operators, ground handling agencies and other organisations working at the aerodrome referred to in 304.5.2.

304.6.2 The audits referred to in 304.6.1 shall be carried out every 12 months or less, as agreed with the Authority.

304.6.3 The aerodrome operator shall ensure that the audit reports including the report on the aerodrome facilities, equipment and services, are prepared by suitably qualified safety experts.

304.6.4 The aerodrome operator shall retain a copy of the report(s) referred to in regulation 304.6.3 for a period of 3 years. The Authority may request a copy of the report(s) for its review and reference.

304.6.5 The report(s) referred to in regulation 304.6.3 must be prepared and signed by the persons who carried out the audits and inspections.

304.7 ACCESS TO AERODROME

304.7.1 Personnel authorized by the Authority may inspect and carry out tests on the aerodrome facilities, services and equipment, inspect aerodrome operator's documents and records and verify the aerodrome operator's safety management system before the aerodrome license is granted or renewed, and subsequently, at any other time, for the purpose of ensuring safety and order at the aerodrome.

304.7.2 An aerodrome operator shall issue permanent security passes to personnel authorized by the Authority to enable access to any part of the aerodrome or any aerodrome facility including, but not limited to, aircraft, tenant company premises, equipment, records, documents and operator's personnel for the purpose referred to in 304.7.1.

304.7.3 The aerodrome operator shall cooperate in conducting the activities referred to in 304.7.1.

304.8 PHOTOGRAPHY ON THE AERODROME

304.8.1 Personnel authorized by the Authority may take photographs of the aerodrome facilities and equipment, for licensing, audit and approval purposes.

304.8.2 An aerodrome operator shall issue photography permits to personnel authorized by the Authority.

304.9 NOTIFYING AND REPORTING

304.9.1 An aerodrome operator shall notify and report to the Authority, air traffic control and pilots within the specified time limits required by these regulations.

304.9.2 Notification of inaccuracies in Aeronautical Information Service (AIS) publications:

304.9.2.1 An aerodrome operator shall review the issues of Aeronautical Information Publication (AIP), AIP Supplements, AIP Amendments, and Notices to Airmen (NOTAM), Pre-flight Information Bulletins and Aeronautical Information Circulars issued by the AIS on initial receipt thereof and at regular intervals thereafter. Immediately after such reviews, an aerodrome operator shall notify AIS of any inaccurate information contained, therein, that pertains to the aerodrome.

304.9.3 Notification of changes in aerodrome facilities, equipment, and level of service planned in advance:

304.9.3.1 An aerodrome operator shall submit a request for approval from the Authority in writing at least 3 months before any change to the aerodrome facility or equipment or the level of service at the aerodrome that has been planned in advance and that is likely to affect the accuracy of the information contained in any AIS publication referred to in 304.9.2.

304.9.4 Issues requiring immediate notification - An aerodrome operator shall give to AIS and cause to be received at air traffic control and the flight operations unit, immediate notice giving details of any of the following circumstances of which the operator has the knowledge:

304.9.4.1 Obstacles, obstructions and hazards:

- Any projections by an object through an Obstacle Limitation Surface (as approved by the Authority) relating to the aerodrome; and
- The existence of any obstruction or hazardous condition affecting aviation safety at or near the aerodrome;

304.9.4.2 Level of service:

- Reduction in the level of service at the aerodrome as set out in any of the AIS publications referred to in 304.9.2;

304.9.4.3 Movement area:

- Closure of any part of the movement area of the aerodrome; and

304.9.4.4 Any other condition that could affect aviation safety at the aerodrome and against which precautions are warranted.

304.10 SPECIAL INSPECTIONS

304.10.1 An aerodrome operator shall inspect an aerodrome, as the circumstances require, ensuring aviation safety:

304.10.2. As soon as practicable, after any aircraft accident or incident within the meaning of these terms defined in LARs VIII – **Aircraft Accident Investigation**. (TBD)

304.10.3 During any period of construction or repair of the aerodrome facilities or equipment that is critical to the safety of aircraft operation; and

304.10.4 At any other time when there are conditions at the aerodrome that could affect aviation safety.

304.11 REMOVAL OF OBSTRUCTION FROM THE AERODROME SURFACE

304.11.1 An aerodrome operator shall remove from the surface of the aerodrome any vehicle or other obstruction that is likely to be hazardous.

304.12 WARNING NOTICES

304.12.1 Where low flying aircraft, at or near an aerodrome, or taxiing aircraft are likely to be hazardous to people or vehicular traffic, the aerodrome operator shall:

304.12.1.1 Post notices warning of the hazard on any public way that is adjacent to the manoeuvring area; or

304.12.1.2 If such a public way is not controlled by the aerodrome operator, inform the Authority responsible for posting the notices on the public way that there is a hazard.

- END -

SUBPART 305

PHYSICAL CHARACTERISTICS

305.1 RUNWAYS

GENERAL

Many factors affect the determination, siting and number of runways. One important factor is the usability factor, as determined by the wind distribution. Another important factor is the alignment of the runway to facilitate the provision of approaches conforming to the approach surface requirements of Chapter 6. When a new instrument runway is being located, particular attention needs to be given to areas over which aeroplanes will be required to fly when following instrument approach and missed approach procedures, so as to ensure that obstacles in these areas or other factors will not restrict the operation of the aeroplanes for which the runway is intended.

305.1.1 The number and orientation of runways at an aerodrome should be such that the usability factor of the aerodrome is not less than 95 per cent for the aeroplanes that the aerodrome is intended to serve.

305.1.2 The siting and orientation of runways at an aerodrome should, whenever possible, be such the arrival and departure tracks minimise interference with the areas approved for residential use and other noise sensitive areas close to the aerodrome in order to avoid future noise problems.

305.1.3 Choice of maximum permissible cross-wind components

In the application of 305.1.1 it should be assumed that landing or take-off of aeroplanes is, in normal circumstances, precluded when the cross-wind component exceeds:

- 37 km/h (20 kt) in the case of aeroplanes whose reference field length is 1 500 m or over, except that when poor runway braking action owing to an insufficient longitudinal coefficient of friction is experienced with some frequency, a cross-wind component not exceeding 24 km/h (13 kt) should be assumed;
- 24 km/h (13 kt) in the case of aeroplanes whose reference field length is 1 200 m or up to but not including 1 500 m; and
- 19 km/h (10 kt) in the case of aeroplanes whose reference field length is less than 1 200 m.

305.1.4 Data to be used

The selection of data to be used for the calculation of the usability factor should be based on reliable wind distribution statistics that extend over as long a period as possible, preferably of not less than five years. The observations used should be made at least eight times daily and spaced at equal intervals of time.

305.1.5 A threshold should normally be located at the extremity of a runway unless operational considerations justify the choice of another location.

305.1.6 When it is necessary to displace a threshold, either permanently or temporarily, from its normal location, account should be taken of the various factors which may have a bearing on the location of the threshold. Where this displacement is due to an unserviceable runway condition, a cleared and graded area of at least 60 m in length shall be available between the unserviceable area and the displaced threshold. Additional distance shall also be provided to meet the requirements of the runway end safety area as appropriate.

RUNWAY LENGTH

305.1.7 The actual runway length to be provided for a primary runway shall be adequate to meet the operational requirements of the aeroplanes for which the runway is intended and shall not be less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes.

305.1.8 The length of a secondary runway shall be determined similarly to primary runways except that it needs only to be adequate for those aeroplanes which require to use that secondary runway in addition to the other runway or runways in order to obtain a usability factor of at least 95 per cent.

305.1.9 Runways with stopways or clearways.

Where a runway is associated with a stopway or clearway, an actual runway length less than that resulting from application of 305.1.6 or 305.1.7, as appropriate, may be considered satisfactory, but in such a case any combination of runway, stopway and clearway provided should permit compliance with the operational requirements for take-off and landing of the aeroplanes the runway is intended to serve.

RUNWAY WIDTH

305.1.10 The width of a runway should be not less than the appropriate dimension specified in the following tabulation:

Code letter						
Code number	A	B	C	D	E	F
1 ^a	18 m	18 m	23 m	–	–	–
2 ^a	23 m	23 m	30 m	–	–	–
3	30 m	30 m	30 m	45 m	–	–
4	–	–	45 m	45 m	45 m	60 m

a - The width of a precision approach runway should be not less than 30 m where the Code number is 1 or 2.

SEPARATION OF PARALLEL RUNWAYS

305.1.11 Where parallel runways are provided for simultaneous use under visual meteorological conditions only, the minimum distance between their centre lines shall be: 210 m where the higher Code number is 3 or 4; 150 m where the higher Code number is 2; and 120 m where the higher Code number is 1.

305.1.12 Where parallel runways are provided for simultaneous operations under instrument meteorological conditions, the minimum separation distance between their center lines shall be: 1035 m for independent parallel approaches; 915 m for dependent parallel approaches; 760 m for independent parallel departures; 760 m for segregated parallel operations; except that for segregated parallel operations the specified separation distance: a) may be decreased by 30 m for each 150 m that the arrival runway is staggered toward the arriving aircraft, to a minimum of 300 m; and b) shall be increased by 30 m for each 150 m that the arrival runway is staggered away from the arriving aircraft.

SLOPES ON RUNWAYS

- 305.1.13 Longitudinal slopes. The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length shall not exceed: 1 per cent where the Code number is 3 or 4; and 2 per cent where the Code number is 1 or 2.
- 305.1.14 Along no portion of a runway shall the longitudinal slope exceed: 1.25 per cent where the Code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope shall not exceed 0.8 per cent; 1.5 per cent where the Code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope shall not exceed 0.8 per cent; and 2 per cent where the Code number is 1 or 2.
- 305.1.15 Longitudinal slope changes. Where slope changes cannot be avoided, a slope change between two consecutive slopes shall not exceed: 1.5 per cent where the Code number is 3 or 4; and 2 per cent where the Code number is 1 or 2.
- 305.1.16 The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:
- 0.1 per cent per 30 m (minimum radius of curvature of 30 000 m) where the Code number is 4;
 - 0.2 per cent per 30 m (minimum radius of curvature of 15 000 m) where the Code number is 3; and
 - 0.4 per cent per 30 m (minimum radius of curvature of 7 500 m) where the Code number is 1 or 2.
- 305.1.17 Sight distance. Where slope changes cannot be avoided, they should be such that there will be an unobstructed line of sight from:
- Any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the Code letter is C, D, E or F.
 - Any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the Code letter is B; and
 - Any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the Code letter is A.
- 305.1.18 Distance between slope changes. Undulations or appreciable changes in slopes located close together along a runway should be avoided. The distance between the points of intersection of two successive curves should not be less than:
- a) The sum of the absolute numerical values of the corresponding slope changes multiplied by the appropriate value as follows:
 - 30 000 m where the Code number is 4;
 - 15 000 m where the Code number is 3; and
 - 5 000 m where the Code number is 1 or 2; or
 - b) 45 m;
- whichever is greater.

305.1.19 Transverse slopes. To promote the most rapid drainage of water, the runway surface should, if practicable, be cambered except where a single cross-fall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should ideally be:

- 1.5 per cent where the Code letter is C, D, E or F; and
- 2 per cent where the Code letter is A or B;

but in any event should not exceed 1.5 per cent or 2 per cent, as applicable, nor be less than 1 per cent except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface the transverse slope on each side of the centre line should be symmetrical.

305.1.20 The transverse slope should be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.

STRENGTH OF RUNWAYS

305.1.21 A runway shall be capable of withstanding the traffic of aeroplanes the runway is intended to serve.

SURFACE OF RUNWAYS

305.1.22 The surface of a runway shall be constructed without irregularities that would result in loss in friction characteristics or otherwise adversely affect the take-off or landing of an aeroplane.

305.1.23 The surface of a paved runway shall be so constructed as to provide good friction characteristics when the runway is wet.

305.1.24 Measurements of the friction characteristics of a new or resurfaced runway shall be made with a continuous friction measuring device using self-wetting features in order to assure that the design objectives with respect to its friction characteristics have been achieved.

305.1.25 The average surface texture depth of a new surface shall be not less than 1.0 mm.

305.1.26 When the surface is grooved or scored, the grooves or scorings should be either perpendicular to the runway centre line or parallel to non-perpendicular transverse joints, where applicable.

305.2 RUNWAY SHOULDERS

305.2.1 Runway shoulders shall be provided for a runway where the Code letter is D, E and the runway width is less than 60 m

305.2.2 Runway shoulders shall be provided for a runway where the Code letter is F.

305.2.3 Width of runway shoulders. The runway shoulders should extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

- 60 m where the Code letter is D or E; and
- 75 m where the Code letter is F.

305.2.4 Slopes on runway shoulders. The surface of the shoulder that abuts the runway shall be flush with the surface of the runway and its transverse slope shall not exceed 2.5 per cent.

305.2.5 Strength of runway shoulders. A runway shoulder shall be prepared or constructed so as to be capable, in the event of an aeroplane running off the runway, of supporting the aeroplane without inducing structural damage to the aeroplane and of supporting ground vehicles which may operate on the shoulder.

305.3 RUNWAYS TURN PADS

GENERAL

305.3.1 Where the end of a runway is not served by a taxiway or a taxiway turnaround and where the code letter is D, E or F, a runway turn pad shall be provided to facilitate a 180-degree turn of aeroplanes.

305.3.2 Where the end of a runway is not served by a taxiway or a taxiway turnaround and where the code letter is A, B or C, a runway turn pad should be provided to facilitate a 180-degree turn of aeroplanes.

305.3.3 The runway turn pad may be located on either the left or right side of the runway and adjoining the runway pavement at both ends of the runway and at some intermediate locations where deemed necessary.

305.3.4 The intersection angle of the runway turn pad with the runway should not exceed 30 degrees.

305.3.5 The nose wheel steering angle to be used in the design of the runway turn pad should not exceed 45 degrees.

305.3.6 The design of a runway turn pad shall be such that, when the cockpit of the aeroplane for which the turn pad is intended remains over the turn pad marking, the clearance distance between ant wheel of the aeroplane landing gear and the edge of the turn pad shall be not less than that given by the following tabulation:

Code letter	Clearance
A	1.5 m
B	2.25 m
C	3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m; 4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 .
D	4.5 m
E	4.5 m
F	4.5 m

305.3.7 Where severe weather conditions and resultant lowering of surface friction characteristics prevail, a larger wheel-to-edge clearance of 6 m should be provided where the code letter is E or F.

SLOPES AND RUNWAY TURN PADS

305.3.8 The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.

STRENGTH OF RUNWAY TURN PADS

305.3.9 The strength of a runway turn pad should be at least equal to that of the adjoining runway which it serves, due consideration being given to the fact that the turn pad will be subjected to slow-moving traffic making hard turns and consequent higher stresses on the pavement.

SURFACE OF RUNWAY TURN PADS

305.3.10 The surface of a runway turn pad should not have surface irregularities that may cause damage to an aeroplane using the turn pad.

305.3.11 The surface of a runway turn pad should be so constructed as to provide good friction characteristics for aeroplanes using the facility when the surface is wet.

SHOULDERS FOR RUNWAY TURN PADS

305.3.12 The runway turn pads should be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding aeroplane for which the turn pad is intended, and any possible foreign object damage to the aeroplane engines.

305.3.13 The strength of runway turn pad shoulders should be capable of withstanding the occasional passage of the aeroplane it is designed to serve without inducing structural damage to the aeroplane and to the supporting ground vehicles that may operate on the shoulder.

305.4 RUNWAY STRIPS

305.4.1 A runway and any associated stopways shall be included in a strip.

305.4.2 Length of runway strips. A strip shall extend before the threshold and beyond the end of the runway or stopway for a distance of at least:

- 60 m where the Code number is 2, 3 or 4;
- 60 m where the Code number is 1 and the runway is an instrument one; and
- 30 m where the Code number is 1 and the runway is a non-instrument one.

Width of runway strips.

305.4.3 A strip including a precision approach runway shall extend laterally to a distance of at least:

- 150 m where the Code number is 3 or 4; and
- 75 m where the Code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

305.4.4 A strip including a non-precision approach runway shall extend laterally to a distance of at least:

- 150 m where the Code number is 3 or 4; and

- 75 m where the Code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

305.4.5 A strip including a non-instrument runway shall extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

- 75 m where the Code number is 3 or 4;
- 40 m where the Code number is 2; and
- 30 m where the Code number is 1.

305.4.6 Objects on runway strips.

An object situated on a runway strip which may endanger aeroplanes shall be regarded as an obstacle and shall, as far as practicable, be removed.

305.4.7 No fixed object, other than visual aids required for air navigation purposes and satisfying the relevant frangibility requirement in Chapter 7, shall be permitted on a runway strip:

- a) within 77.5 m of the runway centre line of a precision approach runway category I, II or III where the Code number is 4 and the Code letter is F; or
- b) within 60 m of the runway centre line of a precision approach runway category I, II or III where the Code number is 3 or 4; or
- c) within 45 m of the runway centre line of a precision approach runway category I where the Code number is 1 or 2.

No mobile object shall be permitted on this part of the runway strip during the use of the runway for landing or take-off.

Grading of runway strips.

305.4.8 That portion of a strip of an instrument and a non-instrument runway within a distance of at least:

- 75 m where the Code number is 3 or 4; and
- 40 m where the Code number is 1 or 2;

from the centre line of the runway and its extended centre line should provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

305.4.9 The surface of a strip that abuts a runway, shoulder or stopway shall be flush with the surface of the runway, shoulder or stopway.

305.4.10 That portion of a strip to at least 30 m before a threshold shall be prepared against blast erosion in order to protect a landing aeroplane from the danger of an exposed edge.

Slopes on runway strips

305.4.11 Longitudinal slopes. A longitudinal slope along that portion of a strip to be graded shall not exceed:

- 1.5 per cent where the Code number is 4;
- 1.75 per cent where the Code number is 3; and
- 2 per cent where the Code number is 1 or 2.

305.4.12 Longitudinal slope changes. Slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes avoided.

305.4.13 Transverse slopes. Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:

- 2.5 per cent where the Code number is 3 or 4; and
- 3 per cent where the Code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 per cent.

305.4.14 The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 per cent as measured in the direction away from the runway.

Strength of runway strips

305.4.15 That portion of a strip of an instrument or a non- instrument runway within a distance of at least:

- 75 m where the Code number is 3 or 4; and
- 40 m where the Code number is 1 or 2;

from the centre line of the runway and its extended centre line should be so prepared or constructed as to minimize hazards arising from differences in load bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

305.5 RUNWAY END SAFETY AREAS

305.5.1 A runway end safety area shall be provided at each end of a runway strip where the Code number is 3 or 4, and where the Code number is 1 and 2 with an instrument runway.

305.5.2 A runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m.

305.5.3 A runway end safety area shall extend from the end of a runway strip to a distance of at least:

- 240 m where the Code number is 3 or 4 and
- 120 m where the Code number is 1 or 2.

305.5.4 The width of a runway end safety area shall be at least twice that of the associated runway.

305.5.5 The width of a runway end safety area should, whenever practical, be equal to that of the graded portion of the associated runway strip.

305.5.6 An object situated on a runway end safety area which may endanger aeroplanes shall be regarded as an obstacle and shall be removed.

Clearing and grading of runway end safety areas

305.5.7 A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

Slopes on runway end safety areas

General

305.5.8 The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

Longitudinal slopes

305.5.9 The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 per cent. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes avoided.

Transverse slopes

305.5.10 The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 per cent. Transitions between differing slopes should be as gradual as practicable.

Strength of runway end safety areas

305.5.11 A runway end safety area should be so prepared or constructed as to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, enhance aeroplane deceleration and facilitate the movement of rescue and fire fighting vehicles.

305.6 CLEARWAYS

305.6.1 The origin of a clearway shall be at the end of the take-off run available.

305.6.2 The length of a clearway shall not exceed half the length of the take-off run available.

305.6.3 A clearway shall extend laterally to a distance of at least 75 m on each side of the extended centre line of the runway.

Slopes on clearways

305.6.4 The ground in a clearway should not project above a plane having an upward slope of 1.25 per cent, the lower limit of this plane being a horizontal line which:

- a) is perpendicular to the vertical plane containing the runway centre line; and
- b) passes through a point located on the runway centre line at the end of the take-off run available.

305.6.5 Abrupt upward changes in slope should be avoided when the slope on the ground in a clearway is relatively small or when the mean slope is upward. In such situations, in that portion of the clearway within a distance of 22.5 m or half the runway width whichever is greater on each side of the extended centre line, the slopes, slope changes and the transition from runway to clearway should generally conform with those of the runway with which the clearway is associated.

Objects on clearways

305.6.6 An object situated on a clearway which may endanger aeroplanes in the air should be regarded as an obstacle and should be removed

305.7 STOPWAYS

305.7.1 A stopway shall have the same width as the runway with which it is associated.

Slopes on stopways

305.7.2 Slopes and changes in slope on a stopway, and the transition from a runway to a stopway, should comply with the specifications of 305.1.305.1 to 305.1.305.7 for the runway with which the stopway is associated except that:

- a) the limitation in 305.1.305.2 of a 0.8 per cent slope for the first and last quarter of the length of a runway need not be applied to the stopway; and
- b) at the junction of the stopway and runway and along the stopway the maximum rate of slope change may be 0.3 per cent per 30 m (minimum radius of curvature of 10 000 m) for a runway where the Code number is 3 or 4.

Strength of stopways

305.7.3 A stopway should be prepared or constructed so as to be capable, in the event of an abandoned take-off, of supporting the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane.

Surface of stopways

305.7.4 The surface of a paved stopway should be so constructed as to provide a good coefficient of friction to be compatible with that of the associated runway when the stopway is wet.

305.7.5 The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated.

305.8 RADIO ALTIMETER OPERATING AREA

305.8.1 A radio altimeter operating area shall be established in the pre-threshold area of a precision approach runway

305.8.2A radio altimeter operating area shall extend before the threshold for a distance of at least 300 m.

Width of the area

305.8.3 A radio altimeter operating area should extend laterally, on each side of the extended centre line of the runway, to a distance of 60 m, except that, when special circumstances so warrant, the distance may be reduced to no less than 30 m if an aeronautical study indicates that such reduction would not affect the safety of operations of aircraft.

Longitudinal slope changes

305.8.4 On a radio altimeter operating area, slope changes should be avoided or kept to a minimum. Where slope changes cannot be avoided, the slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes avoided. The rate of change between two consecutive slopes should not exceed 2 per cent per 30 m.

305.9 TAXIWAYS

305.9.1 Taxiways shall be provided to permit the safe and expeditious surface movement of aircraft.

305.9.2 Sufficient entrance and exit taxiways for a runway shall be provided to expedite the movement of aeroplanes to and from the runway and provision of rapid exit taxiways considered when traffic volumes are high.

305.9.3 The design of a taxiway should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway should be not less than 4.5 m.

Width of Taxiways

305.9.4 A straight portion of a taxiway should have a width of not less than that given by the following :
Code letter A : 7.5 m. Code letter B : 10.5 m, Code letter C: 18 m, Code letter D and E : 23 m
Code letter F: 25 m.

Taxiway curves.

305.9.5 Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. The design of the curve should be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should not be less than 4.5 m.

Junctions and intersections

305.9.6 To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. The design of the fillets should ensure that the minimum wheel clearances not less than 4.5 m are maintained when aeroplanes are manoeuvring through the junctions or intersections.

Taxiway minimum separation distances

305.9.7 The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table 3-1 of Annex 14, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

Slopes on taxiways

305.9.8 Longitudinal slopes

The longitudinal slope of a taxiway should not exceed:

- 1.5 per cent where the Code letter is C, D, E or F; and
- 3 per cent where the Code letter is A or B.

305.9.9 Longitudinal slope changes

Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:

- 1 per cent per 30 m (minimum radius of curvature of 3000 m) where the Code letter is C, D, E or F; and
- 1 per cent per 25 m (minimum radius of curvature of 2500 m) where the Code letter is A or B

305.9.10 Sight distance

Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

- 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point.

305.9.11 Transverse slopes

The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway but should not exceed:

- 1.5 per cent where the code letter is C, D, E or F; and
- 2 per cent where the code letter is A or B.

Strength of taxiways

305.9.12 The strength of a taxiway should be at least equal to that of the runway it serves, due consideration being given to the fact that a taxiway will be subjected to a greater density of traffic and, as a result of slow moving and stationary aeroplanes, to higher stresses than the runway it serves.

Surface of taxiways

305.9.13 The surface of a taxiway should not have irregularities that cause damage to aeroplane structures.

305.9.14 The surface of a paved taxiway should be so constructed as to provide good friction characteristics when the taxiway is wet.

Rapid exit taxiways

305.9.15 A rapid exit taxiway should be designed with a radius of turn-off curve of at least:

- 550 m where the Code number is 3 or 4; and
- 275 m where the Code number is 1 or 2;

to enable exit speeds under wet conditions of:

- 93 km/h where the Code number is 3 or 4; and
- 65 km/h where the Code number is 1 or 2.

305.9.16 The radius of the fillet on the inside of the curve at a rapid exit taxiway should be sufficient to provide a widened taxiway throat in order to facilitate early recognition of the entrance and turn-off onto the taxiway.

305.9.17 A rapid exit taxiway should include a straight distance after the turn-off curve sufficient for an exiting aircraft to come to a full stop clear of any intersecting taxiway.

305.9.18 The intersection angle of a rapid exit taxiway with the runway should not be greater than 45° nor less than 25° and preferably should be 30°.

Taxiways on bridges

305.9.19 The width of that portion of a taxiway bridge capable of supporting aeroplanes, as measured perpendicularly to the taxiway centre line, shall not be less than the width of the graded area of the strip provided for that taxiway, unless a proven method of lateral restraint is provided which shall not be hazardous for aeroplanes for which the taxiway is intended.

305.9.20 Access should be provided to allow rescue and fire fighting vehicles to intervene in both directions within the specified response time to the largest aeroplane for which the taxiway bridge is intended.

305.9.21 A bridge should be constructed on a straight section of the taxiway with a straight section on both ends of the bridge to facilitate the alignment of aeroplanes approaching the bridge.

305.10 Taxiway shoulders

305.10.1 Straight portions of a taxiway where the Code letter is C, D, E or F should be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than:

- 60 m where the Code letter is F;
- 44 m where the Code letter is E;
- 38 m where the Code letter is D; and
- 25 m where the Code letter is C.

On taxiway curves and on junctions or intersections where increased pavement is provided, the shoulder width should be not less than that on the adjacent straight portions of the taxiway.

305.10.2 When a taxiway is intended to be used by turbine-engined aeroplanes, the surface of the taxiway shoulder should be so prepared as to resist erosion and the ingestion of the surface material by aeroplane engines.

305.11 Taxiway strips

General

305.11.1 A taxiway, other than an aircraft stand taxiway, shall be included in a strip.

Width of taxiway strips

305.11.2 A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in

- Code letter A,B : 21.5 m
- Code letter C,D : 40.5 m
- Code letter E : 47.5 m
- Code letter F : 57.5 m

Objects on taxiway strips

305.11.3 The taxiway strip should provide an area clear of objects which may endanger taxiing aeroplanes.

Grading of taxiway strips

305.11.4 The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of at least:

- 11 m where the Code letter is A;
- 12.5 m where the Code letter is B or C;
- 19 m where the Code letter is D;
- 22 m where the Code letter is E; and
- 30 m where the Code letter is F.

Slopes on taxiway strips

305.11.5 The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:

- 2.5 per cent for strips where the Code letter is C, D, E or F; and
- 3 per cent for strips of taxiways where the Code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 per cent measured with reference to the horizontal.

305.11.6 The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 per cent as measured in the direction away from the taxiway.

305.12 HOLDING BAYS, RUNWAY-HOLDING POSITIONS, INTERMEDIATE HOLDING POSITIONS AND ROAD-HOLDING POSITIONS

General

305.12.1 Holding bay(s) should be provided when the traffic density is medium or heavy.

305.12.2 A runway-holding position or positions shall be established:

- a) on the taxiway, at the intersection of a taxiway and a runway; and
- b) at an intersection of a runway with another runway when the former runway is part of a standard taxi-route.

305.12.3 A runway-holding position shall be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids.

305.12.4 An intermediate holding position should be established on a taxiway at any point other than a runway-holding position where it is desirable to define a specific holding limit.

305.12.5 A road-holding position shall be established at an intersection of a road with a runway.

Location

305.12.6 The distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway shall be 90 m for a Code letter E

and 107.5 m for a Code letter F and, in the case of a precision approach runway, such that a holding aircraft or vehicle will not interfere with the operation of radio navigation aids.

305.12.7 At elevations greater than 700 m (2 300 ft) the distance of 90 m specified in Table 3-2 for a precision approach runway code number 4 should be increased as follows:

- a) up to an elevation of 2 000 m (6 600 ft); 1 m for every 100 m (330 ft) in excess of 700 m (2 300 ft);
- b) elevation in excess of 2 000 m (6 600 ft) and up to 4 000 m (13 320 ft); 13 m plus 1.5 m for every 100 m (330 ft) in excess of 2 000 m (6 600 ft); and
- c) elevation in excess of 4 000 m (13 320 ft) and up to 5 000 m (16 650 ft); 43 m plus 2 m for every 100 m (330 ft) in excess of 4 000 m (13 320 ft).

305.12.8 If a holding bay, runway- holding position or road-holding position for a precision approach runway Code number 4 is at a greater elevation compared to the threshold, the distance of 90 m or 107.5 m, as appropriate, should be further increased 5 m for every metre the bay or position is higher than the threshold.

305.12.9 The location of a runway-holding position established in accordance with 305.12.3 shall be such that a holding aircraft or vehicle will not infringe the obstacle free zone, approach surface, take-off climb surface or ILS/MLS critical/ sensitive area or interfere with the operation of radio navigation aids.

305.13 APRONS

305.13.1 Aprons shall be provided where necessary to permit the on – and off – loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with the aerodrome traffic.

305.13.2 The total apron area should be adequate to permit expeditious handling of the aerodrome traffic at its maximum anticipated density.

Strength of aprons

305.13.3 Each part of an apron should be capable of withstanding the traffic of the aircraft it is intended to serve, due consideration being given to the fact that some portions of the apron will be subjected to a higher density of traffic and, as a result of slow moving or stationary aircraft, to higher stresses than a runway.

Slopes on aprons

305.13.4 Slopes on an apron, including those on an aircraft stand taxilane, should be sufficient to prevent accumulation of water on the surface of the apron but should be kept as level as drainage requirements permit.

305.13.5 On an aircraft stand the maximum slope should not exceed 1 per cent.

Clearance distances on aircraft stands

305.13.6 An aircraft stand should provide the following minimum clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects:

Code letter	Clearance
A	3 m
B	3 m
C	4.5 m
D	7.5 m
E	7.5 m
F	7.5 m

When special circumstances so warrant, these clearances may be reduced at a nose-in aircraft stand, where the Code letter is D, E or F:

- a) between the terminal, including any fixed passenger bridge, and the nose of an aircraft; and
- b) over any portion of the stand provided with azimuth guidance by a visual docking guidance system.

305.14 ISOLATED AIRCRAFT PARKING POSITION

305.14.1 An isolated aircraft parking position shall be designated or the aerodrome control tower shall be advised of an area or areas suitable for the parking of an aircraft which is known or believed to be the subject of unlawful interference, or which for other reasons needs isolation from normal aerodrome activities.

305.14.2 The isolated aircraft parking position shall be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings, or public use areas, etc. Care shall be taken to ensure that the position is not located over underground utilities such as gas and aviation fuel and, to the extent feasible, electrical or communication cables.

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