CIVIL AVIATION DIRECTIVE – 1407

WATER AERODROMES

CIVIL AVIATION AUTHORITY OF MALAYSIA

ISSUE 01
REVISION 00 – 15TH MAY 2022

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Introduction

In exercise of the powers conferred by section 24O of the Civil Aviation Act 1969 (Act 3), the Chief Executive Officer makes this Civil Aviation Directive 1407 (“CAD 1407") – Water Aerodromes, pursuant to Regulation(s) 12-15, 17-20, 22-23, 35, 36, 38-45, 47-54, 63, 64, 65 of the Civil Aviation (Aerodrome Operation) Regulations 2016 (CAR (AO) 2016)

This CAD contains the standards and requirements pertaining to standards for STOLport and is compliant with Civil Aviation (Aerodrome Operation) Regulations 2016 (CAR(AO) 2016). This Civil Aviation Directives 1407 – Water Aerodromes is published by the Chief Executive Officer under Section 24O of the Civil Aviation Act 1969 [Act 3] and come into operation on 15th May 2022.

Non-compliance with this CAD

Any person who contravenes any provision in this Directive commits an offence and shall on conviction be liable to the punishment under section 24O (2) of the Civil Aviation Act 1969 (Act 3) and/or under Civil Aviation (Aerodrome Operation) Regulations 2016.

(Datuk Captain Chester Voo Chee Soon)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Directive components and Editorial practices

This Civil Aviation Directive is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as *"shall"* or *"must"*, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as "*should"* or "*may*", are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Appendices: Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

It is to be noted that some Standards in this Civil Aviation Directive incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Directive, the use of the male gender should be understood to include male and female persons

Record of Revisions

Revisions to this CAD shall be made by authorised personnel only. After inserting the revision, enter the required data in the revision sheet below. The *'Initials'* has to be signed off by the personnel responsible for the change.

Rev No.	Revision Date	Revision Details	Initials

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Summary of Changes

ISS/REV no.	Item no.	Revision Details

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1 General

1.1 Introduction

1.1.1 These This Directive outlines the recommended specifications for the physical characteristics, obstacle limitation surfaces (OLS), visual aids, services and operating procedures to be provided at a water aerodrome.

1.1.2 CAD 14 Vol. I do not differentiate between land and water as a surface from which aircraft can operate and states that an aerodrome can be an area of land or water. However, operations by aeroplanes on water differ significantly from those conducted on land. The specifications outlined in this directive focus on those facilities, services and equipment where water aerodromes differ from land aerodromes in terms of their design and operations.

1.1.3 When on the water, seaplanes will be subject to maritime regulations or statutes. It is recommended that water aerodrome operators and developers consult with maritime authorities to ensure applicable requirements are identified and complied with.

1.1.4 Caution is required within proximity of a seaplane landing and take-off area. Appropriate warning signage indicating the presence of seaplane activity shall be considered.

1.2 Citation

1.2.1 These Directives are the Civil Aviation Directives 1407 – Water Aerodrome (CAD 1407), Issue 01/Revision 00, and comes into operation on 15th May 2022.

1.2.2 This CAD 1407, Issue 01/Revision 00 will remain current until withdrawn or superseded.

1.3 Applicability

1.3.1 This CAD shall be applicable to:

a) Seaplanes of a maximum certified take-off weight of 5700 kg or less.

b) specifications stated in this directive are only for flights conducted by day light hours and under Visual Flight Rules (VFR).

1.4 Revocation

1.4.1 RESERVED

1.5 Definition

1.5.1 For the definitions of this CAD, refer to CAD 14 Vol. I – Standards for Aerodrome accordingly. Additional definitions applicable to this Directive are as follows:

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

Aeroplane *means* a power-driven heavier than air aircraft deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Fixed platform *means* a platform extending from the shore, on water and supported by pillars to hold it in position, intended to align alongside seaplanes for the purposes of embarkation and disembarkation of passengers, loading and unloading of cargo, or refuelling or parking of seaplanes.

Floating platform *means* a platform placed on open water intended for the purpose of embarkation and disembarkation of passengers, loading and unloading of cargo by seaplane.

Gangway *means* a movable walkway where people board and disembark such as platforms, and piers.

Low water level *means* the average low level during that month of the year when levels are lowest or, in the case of tidal waters, the average level of low water springs or lower low waters, depending on the type of tide.

Mooring *means* a fixed permanent installation on the water surface used to secure seaplanes. The seaplane may be moored to a floating buoy, a pier, platforms, etc.

Mooring buoy *means* a buoy connected by chain or cable to a permanent unmovable anchor sunk deeply into the bottom of a body of water.

Movement area *means* the part of an aerodrome to be used for take-off, landing and taxiing of seaplanes, consisting of the manoeuvring area and platforms.

Protected area *means* an area which is protected from large waves. The structure providing protection can be natural or constructed.

Seaplane *means* an aeroplane on floats (amphibious or non-amphibious) or a flying boat (water-only or amphibious).

Taxi channel *means* a defined path on a water aerodrome, intended for the use of taxiing seaplanes.

Turning basin *means* a water area used for the water taxi manoeuvring of seaplanes along shoreline facilities and at the ends of a narrow water runway.

Waterways *means* a river, canal or other waterbody serving as a route or way of travel or transport.

Water aerodrome *means* a defined area, primarily on water, intended to be used either wholly or in part for the arrival, departure and movement of seaplanes, and any building and equipment on ground or water.

Water aerodrome operator *means* any organisation/ or person in charge of a water aerodrome including employee, agent or other authorised representative.

Water current *means* the rate of flow of the water.

Water runway (channel) *means* a defined rectangular area on a water aerodrome, intended for the landing and take-off of seaplanes along its length.

1.6 Certification of water aerodromes

1.6.1 Water Aerodromes shall be certified in accordance with the specifications contained in this Directive as well as other relevant ICAO documents.

1.6.2 The regulatory framework for certification of water aerodrome is in accordance with the provision contained in CAD 1405.

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2 Water Aerodrome Data

*Note. — This Section contains specifications for the provision of data relating to the water aerodrome that is to be determined and recorded in the **Water Aerodrome Manual**. This Section is also used to define the characteristics of water aerodrome that are to be made available through the aeronautical information publications and/or disseminated through an aeronautical information service.*

2.1 Water aerodrome data quality requirements

2.1.1 Except as specified, the determination and reporting of water aerodrome-related aeronautical data shall be in accordance with the accuracy requirements set forth below taking into account the established quality system procedures:

a) The water aerodrome elevation shall be measured to the accuracy and rounded up to the next higher of one half meter;

b) Linear dimensions shall be measured to the nearest one-half meter;

c) Aeronautical geographical co-ordinates (indicating latitude and longitude) shall beexpressed in terms of the WGS-84 reference datum;

d) True bearings shall be measured to the nearest degree;

e) Water depths shall be measured and rounded down to the nearest one tenth of meter;and

f) Tides shall be measured with respect to lowest tides recorded for the location.

2.2 Geographic data

Geometric centre

2.2.1 The geometric centre of a water aerodrome shall be determined and given to the nearest 1/10thsecond.

Water aerodrome elevation

2.2.2 Average highest elevation of the water runway shall be measured with reference to mean sea level.

Water aerodrome magnetic variation

2.2.3 The magnetic variation for the water aerodrome geometric centre shall be determined and given to the nearest degree from magnetic north.

Navigation aids

2.2.4 Where navigation aids are installed for use at water aerodromes, the following information shall be determined and given:

a) the bearing, geographic co-ordinates of the antenna or radiating centre to the nearest 1/10th second; and

b) the elevation of the antenna or radiating centre.

2.3 Water aerodrome dimensions and related information

2.3.1 The following data shall be measured or described and given for each facility provided on awater aerodrome:

a) water runway(s):

1) true bearing;
2) length;
3) width;
4) depth of water; and
5) water current.

b) turning basins:

1) location;
2) dimension; and
3) depth of water.

c) taxi channel:

1) width; and
2) depth of water.

d) shore facility:

1) type; and
2) depth at shore.

e) significant obstacles on and in the vicinity of the water aerodrome:

1) location;
2) top elevation to the nearest (next higher) foot; and
3) type.

f) Marking

1) water runways;
2) taxi channels; and
3) hazardous areas.

2.4 Provision of operational information

Movement area and related facilities

2.4.1 Information on the condition of the movement area and the operational status of related facilities shall be given to the appropriate aeronautical information service;

a) Information of operational significance shall be given to the appropriate air traffic services units; and

b) The information shall be kept up to date.

2.4.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports of operational significance or affecting seaplane performance shall be given to the appropriate air traffic services units in respect of:

a) damage to shore facility;

b) floating debris in the movement area;

c) temporary hazards to include log booms, surface vessels or any other surface orbelow surface hazard;

d) abnormally high/low water depth;

e) water currents;

f) tidal areas, depth of water at high and low tides or seasonal changes; and

g) any other information that may have safety impact on operations.

2.4.3 Information on water runway(s) shall consist of:

a) the tidal range;

b) the times of high and low tide; and

c) the approximate speed and direction of the water current.

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3 Physical Characteristics

3.1 Water runway

Number and orientation of water runways

3.1.1 The number of water runways at a water aerodrome and their orientation should be such that, for a large percentage of time as practicable but for not less than 95 percent there is at least one water runway for which the surface wind velocity component at right angles to its longitudinal axis will not preclude the landing or taking off of seaplane that the water aerodrome is intended to serve.

Length of water runways

3.1.2 The length of the water runway to be provided should be adequate to meet the operational requirements of the critical seaplane for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant seaplanes.

Width of water runways

3.1.3 The width of the water runway should be not less than 60 m wherever practicable.

Water Depth

3.1.4 The depth of the water measured at low water level in the water runway should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum takeoff weight.

Water runway strip

3.1.5 A protective buffer should extend on each side from the edge of the water runway to a distance of not less than 30 m (100 ft.) and on each end of the water runway to a distance of 60 m wherever practicable.

3.2 Turning basins

3.2.1 Turning basins should be provided at the end of the water runway, whenever necessary.

3.2.2 When turning basins are provided it shall have:

a) A diameter measured at low water level of not less than twice the specified minimumwidth of the corresponding water runway;

b) The depth of turning basins measured at low water level should be at least that of thecorresponding water runway; and

c) A horizontal obstruction clearance between the edge of the turning basin and thenearest obstacle of no less than 15 m (50 ft).

3.3 Taxi channels

3.3.1 Taxi channels should be provided to permit the safe and expeditious handling of aerodrome traffic. Where provided, the taxi channels shall have a width of not less than 45 m (150 ft.), wherever practicable

3.3.2 Wingtip to wingtip clearance for passing seaplanes (dual directional taxi channels) should be not less than 15 m (50 ft.).

3.3.3 The depth of the water measured at low water level in the taxi channel should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum take-off weight.

3.4 Mooring areas

3.4.1 Mooring areas should be provided, whenever necessary, for the mooring of seaplane and to permit the embarkation and disembarkation of passengers, loading and unloading of cargo and mail without interfering with the aerodrome traffic.

3.4.2 When mooring areas are provided:

a) The size of the mooring areas should be adequate to permit expeditious handling of the peak hour traffic.

b) The depth of water at the mooring area measured at low water level should be at least that of the corresponding taxi channel.

c) The mooring area shall be designed in such a manner as to provide a minimum clearance of 15 m (50 ft.) between any part of the seaplane and any object it could come into contact with depending on water level.

3.5 Shore facilities

3.5.1 A platform (fixed or floating), ramp or beach should be provided to permit the embarking anddisembarking of passengers and crew, loading and unloading of cargo and refueling.

3.5.2 Where a platform is provided it shall:

a) be in a condition that permits constant use without causing injury to persons or damage to aircraft;

b) be attached or anchored in a manner that prevents it from shifting position or becoming detached;

c) have access from the shore that provides for the safe movement of crew and passengers; and

d) have at least two bull rails or provision for appropriate number of tie-down cleats at each seaplane parking position to secure the seaplane.

3.5.3 When a seaplane is normally secured in a position where any seaplane component overhangs the platform and constitutes a hazard to the movement of crew and passengers, the hazard shall be clearly indicated by means of:

a) cones; and/ or

b) hashed red and white markings; and

c) in a manner easily identifiable to crew and passengers.

3.5.4 Where a ramp or beach is provided it shall be:

a) built 1.5 times the width of floats or landing gear of the largest seaplane intended touse the facility;

b) located in such a manner as to provide a minimum clearance of 1.8 m (6 ft.) betweena seaplane wing and any object it could come into contact with; and

c) constructed with a slope not steeper than 8:1.

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4 Obstacle Restriction and Removal

Note. — This Part establishes a series of Obstacle Limitation Surfaces (OLS) that define the limits to which objects may project into the airspace in order to minimise the dangers presented by obstacles, either during take-off or approach of seaplanes at water aerodromes.

4.1 Obstacle limitation surfaces

4.1.1 The following OLS shall be established for non-instrument water aerodromes as shown in Figure 1 provided in Appendix 1:

a) a take-off climb/approach surface;

b) a transitional surface; and

c) an inner horizontal surface.

Take-off climb /approach Surface

4.1.2 *Description* – The take-off climb/approach surface shall be either straight or curved andestablished at the end/beginning of the water runway strip.

4.1.3 *Characteristics* – The limit of the take-off climb /approach surface shall be:

a) The width of the inner edge shall not be less than that of the associated water runway strip;

b) The inner edge shall start at 60 m from threshold of water runway;

c) The elevation of the inner edge shall be the elevation of the water aerodrome;

d) The length of the take-off climb /approach surface shall not be less than 2500 m(8200 ft.) from the inner edge;

e) The slope of the take-off climb/approach surface shall be a minimum of 4 % (1:25);

f) The centre line of the take-off climb/approach surface shall define the approach pathand be:

1) a straight line; or
2) an arc of constant radius; or
3) a combination of a straight line and an arc of constant radius.

Straight-in take-off climb/Approach Surface

4.1.4 Where the slope is designed for a straight-in approach the divergence of the take-offclimb/approach surface shall be set at 10% starting from the inner edge..

Curved take-off climb/approach Surfaces

4.1.5 Where established, a curved take-off climb/approach surface shall not contain more than onecurved portion.

4.1.6 A curved portion of a take-off climb/approach surface shall not allow a change of directiongreater than 90 degrees.

4.1.7 Where a curved portion of take-off climb/approach surface is provided:

a) the straight portion originating at the inner edge shall not be less than 1300 m (4265 ft.); and

b) the radius of arc defining the centre line of the take-off climb/approach surface shall not in any portion of the take-off climb/approach surface be less than 736 m (2415 ft.)in accordance with **Figure 2** given in **Appendix 1**.

4.1.8 A take-off climb/approach surface incorporating a curved portion shall be established onlywhere guidance, such as, geographical points or other visual references are available.

Note. — A curved approach is normally established at a non-instrument water runway whereit is necessary to avoid obstacles, terrain, noise sensitive areas, or to utilise the airspace above publiclands (e.g. freeways, rivers, golf courses).

Approach type – Non instrument	
Take-off climb/approach surface	
Width of inner edge	Width of water runway strip - (120 m minimum)
Location of inner edge	60 m from the threshold
Divergence take-off climb/approach surface	10 %
Length (minimum)	2500 m
Slope of take-off climb/approach surface (maximum)	4% (1:25)
Transitional Surface:	
Slope (maximum)	Vertical to 15 m then 1:5 (20 %)
Inner Horizontal Surface:	
Height	45 m
Radius	2,500 m

Table 1 - Dimensions and slopes of obstacle limitation surfaces - water aerodromes

4.2 Displaced threshold

4.2.1 Where the integrity of the approach surface cannot be maintained due to fixed or mobile obstacles, a landing threshold shall be displaced from the normal threshold.

4.2.2 This displacement shall be established so that the new approach surface, starting at the displacement, will clear all obstacles.

4.2.3 Where a threshold has been displaced, the inner edge of approach surface shall be located at 60 m from the point of displacement.

4.3 Objects and obstacles

4.3.1 No fixed object shall be permitted on a water runway or on a water runway strip.

4.3.2 Fixed objects or structures that are located within the water aerodrome boundary shall not penetrate OLS unless:

a) those structures are for air navigation purposes; or

b) are essential to the safety of aircraft operation;

c) are marked, in accordance with ICAO CAD 14 Vol. I; and

d) are frangible.

4.3.3 A mobile object shall not penetrate take-off climb/approach surfaces, unless procedures are in place to ensure the object is removed during approach and departure operations.

4.4 Other objects

4.4.1 Where an aeronautical study (safety risk assessment) indicates that an object is hazardous to seaplane located on the movement area or in the air in the immediate vicinity of the water aerodrome, it shall be:

a) removed; or

b) marked; and/or

c) lighted in accordance with CAD 14 Vol. I.

4.4.2 The water aerodrome operator shall conduct a safety risk assessment to establish the required clearances to be used above waterways, lagoons, or harbor.

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5 Visual Aids for Navigation

5.1 Wind direction indicator

5.1.1 Unless the direction of the wind can be obtained by radio, at least one wind direction indicatorshould be installed.

5.1.2 Where a wind direction indicator is installed it shall be:

a) of an international orange, orange and white or red and white colour; and

b) in the form of a truncated cone.

5.1.3 The wind direction indicator should be:

a) visible at a height of 300 m (1000 ft.) above the water runway; and

b) visible from any portion of the manoeuvring area.

5.2 Markings

5.2.1 Dock identification marking

Characteristics

5.2.1.1 Dock identification markings shall consist of:

a) a triangle;

b) painted bull rails as specified in 5.2.1.3.

5.2.1.2 Both markings shall be affixed to the upper surface of the dock so as to be visible from 300 m(1000 ft.) above the water runway.

Bull rails

5.2.1.3 Where bull rails are installed, they shall be painted in alternated bands of international orange and white stripes.

Gangways

5.2.1.4 Gangways shall be painted red or signage provided indicating seaplane access only.

5.2.2 Marker buoys

Characteristics

5.2.2.1 Marker buoys shall be visible to aircraft:

a) manoeuvring on the surface of water; and

b) 300 m (1000 ft.) above the water runway.

Water runway markers

5.2.2.2 Except as specified in 6.2.2.3 at water aerodromes where there is no conflict with marinetraffic or marine regulations:

a) Both ends of the take-off and landing area shall be marked with floating markers.

b) The markers shall be visible from a distance greater than 2 nautical miles.

c) Each marker shall be:

1) of international orange in color; or

2) alternating international orange and white.

5.2.2.3 Where it is impracticable to mark the water runway as specified in 5.2.2.2:

a) guidance such as geographical points and/or other visual references shall be providedto designate the take-off and landing area; and

b) these visual references shall be identified and published.

Displaced threshold markers

5.2.2.4 Where a threshold is displaced permanently or temporarily:

a) the threshold displacement shall be marked with floating markers;

b) the markers shall be visible from a distance of at least 2 nautical miles; and

c) each marker shall be international orange or the markers shall be alternatinginternational orange and white.

Hazardous areas markers

5.2.2.5 Where shoals or other hazards could endanger a seaplane, marker buoys shall be installed toclearly indicate the hazardous area.

5.2.2.6 Marker buoys for delineating hazardous area shall be distinctly marked from water runwaymarkers in colour and shapes.

5.3 Signs

Prohibition signs

5.3.1 A sign shall be provided and displayed on the dock restricting the dock to seaplane operationsonly.

5.3.2 A sign shall be displayed on the dock restricting passengers from the docking area until allseaplanes and propellers have come to a complete stop.

5.4 Strobe Lights

5.4.1 Strobe lights should be installed to delineate water aerodrome facilities wherever necessary.Where installed, the strobe lights shall be:

a) white, quick flashing; and

b) located in an area that is easily and constantly seen by both marine and air traffic.

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6 Visual AIDS for Denoting Obstacles

6.1 Objects to be marked and/or lighted

Fixed objects

6.1.1 Objects that are conspicuous by their shape, size or colour need not be marked.

6.1.2 Except as covered under the Marine Act, objects shall be marked in accordance with 6.2.

6.2 Marking of objects

General

6.2.1 Except as specified in 6.1.1 all fixed objects shall be marked in a conspicuous colour.

6.2.2 Where it is not possible to colour the objects, markers or flags shall be displayed on or abovethe objects.

Use of colours

6.2.3 The colour and form of marking displayed on objects shall be in accordance with CAD 14 Vol. I.

Use of markers

6.2.4 Markers displayed on or adjacent to objects shall be:

a) located in conspicuous positions so as to retain the general definition of the object;and

b) recognisable in clear weather from a distance of:

1) 1000 m for an object to be viewed from the air; and
2) 300 m for an object to be viewed from the ground in all directions in which aseaplane is likely to approach the object.

6.2.5 The shape of the markers shall be:

a) distinctive to the extent necessary to ensure that they are not mistaken for markersemployed to convey other information; and

b) such that the hazard presented by the object they mark is not increased.

6.2.6 The colour selected shall contrast with the background against which it will be seen.

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7 Operational Considerations

7.1 Wildlife strike hazard

7.1.1 The presence of wildlife (birds) on and in the water aerodrome vicinity may pose a serious threat to seaplane operational safety. Action shall be taken to decrease the risk to seaplane operations by adopting measures to minimise the likelihood of collisions between wildlife and seaplane.

7.1.2 The objectives of wildlife hazard management outlined in CAD 14 Vol. I can be applied to water aerodromes.

7.2 Safety management system

7.2.1 A safety management system (SMS) shall be considered for a water aerodrome, given the complexity of the operating environment. However, if the water aerodrome is small and facilitates only simple operations, a risk management plan is sufficient.

7.3 Operational procedures

7.3.1 During operational hours, inspections of the movement areas to remove FOD or other hazards shall be undertaken.

7.3.2 A maintenance program is recommended as a means to ensure that all markers, signs, lighting and other infrastructure that supports the operation of seaplanes remain fit for purpose and suitably visible.

7.4 Environment

7.4.1 In seeking approval for establishment of a water aerodrome, the relevant authorities may require an environmental analysis. This evaluation shall include an analysis of the proposals impact on:

a) water quality;

b) wildlife;

c) existing and proposed land use;

d) noise; and

e) historical/archaeological factors.

7.4.2 Where aviation fuel is provided at a public water aerodrome base, care must be taken to ensure that the storage and delivery systems are safe and that precautions are taken to minimise the possibility of spills and the resulting adverse environmental effects of a fuel spillage. The design of fuelling facilities and storage areas shall comply with local regulations and accepted measures for pollution prevention. Most states have their own environmental laws or regulations as well, all of which need to be considered and followed prior to establishing a water aerodrome.

8 Lighting of Movement Area

8.1 Water aerodrome identification and maneuvering area lighting should be provided for reduced visibility conditions wherever necessary.

8.2 A lighted water aerodrome can be identified by a beacon alternating white and yellow flashes at the rate of 12 to 30 flashes per minute.

8.3 In water traffic congested areas, a radio activated strobe beacon may be used to alert mariners and other airman that a seaplane will be arriving or departing within a short time.

8.4 Floodlights or spotlights should be installed on the shore to illuminate aprons, floats, ramps, and piers wherever necessary. Care must be taken in locating and aiming floodlights to preclude affecting the vision of pilot's landing or taking off or creating distracting reflections.

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9 Rescue and Fire Fighting

Level of protection to be provided

9.1 At water aerodromes the rescue and fire-fighting vessel(s) shall be provided appropriate to thelevel of protection required.

9.2 The rescue vessel(s) provided shall be appropriate for the environment involved and they shall be capable or shall carry equipment capable of accommodating twice the maximum number of passengers carried by the largest type of seaplane serving the water aerodrome.

9.3 The level of protection provided at a water aerodrome for rescue and fire-fighting shall be appropriate to the water aerodrome using principles in paragraphs 9.2.4 and 9.2.5 of CAD 14 Vol. I.

9.4 Types of extinguishing agents and the amount of water for foam production and complimentary agents shall be provided on the rescue and fire-fighting vessel(s) in accordance with the aerodrome category for rescue and fire-fighting determined under Table 9-1 and Table 9-2 of CAD 14 Vol. I.

9.5 The equipment and information sufficient to navigate to and from the incident site, communicate with survivors and rescue personnel, effect entry and fire-fighting and provide medical assistance shall be provided in rescue and fire-fighting vessels.

9.6 A communication system shall be provided linking the water aerodrome fire station, control tower (if available), fire and rescue vessel(s), fire and rescue vehicles and any other fire station (if available) in the vicinity.

9.7 An alerting system for rescue and fire-fighting personnel, capable of being operated by that station, shall be provided at a fire station, any other fire station in the vicinity and the aerodrome control tower.

Response time

9.8 For water aerodromes the operational objective of the RFFS shall be to achieve a response time not exceeding three (03) minutes to any point of each operational water runway, in optimum visibility and surface conditions.

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10 Water Aerodrome Emergency Planning

10.1 The objectives of emergency planning outlined in CAD 14 Vol. I can be equally applied to water aerodromes.

10.2 Minimum expectations when planning and preparing an emergency response shall necessitate engagement with local agencies that are likely to assist. Established procedures shall be developed, with the procedures represented in the local emergency response plan.

10.3 When establishing emergency response arrangements, the hazards associated with seaplane operations, including passenger evacuation shall be considered. For example:

a) deep water;

b) the onset of hypothermia and its associated effects, during and following prolonged immersion in cold water;

c) the immediate toxicity and respiratory effects on survivors in the water following the ingestion of floating fuel and oils and their associated vapours; and

d) fire suppressant foams, powders and gases.

10.4 The emergency response arrangements shall contain provisions for water rescue, fire response and recovery of disabled aircraft from the movement area.

10.5 Consideration shall be given to:

a) number of persons that the largest aircraft can carry;

b) local hazards (water temperatures);

c) availability of rescue boats (shallow water/surface considerations);

d) flotation equipment, rafts;

e) thermal blankets;

f) adequate two-way radio equipment shall be provided in all rescue boats in order to maintain communication;

g) flood lighting shall be available for night operations; and

h) a command post and casualty areas shall be established at a safe location on adjacent land.

10.6 The emergency response arrangements shall contain procedures for periodic testing to ensure their adequacy and to improve its effectiveness.

10.7 Local responders shall be familiar with the operating environment and the established emergency response arrangements.

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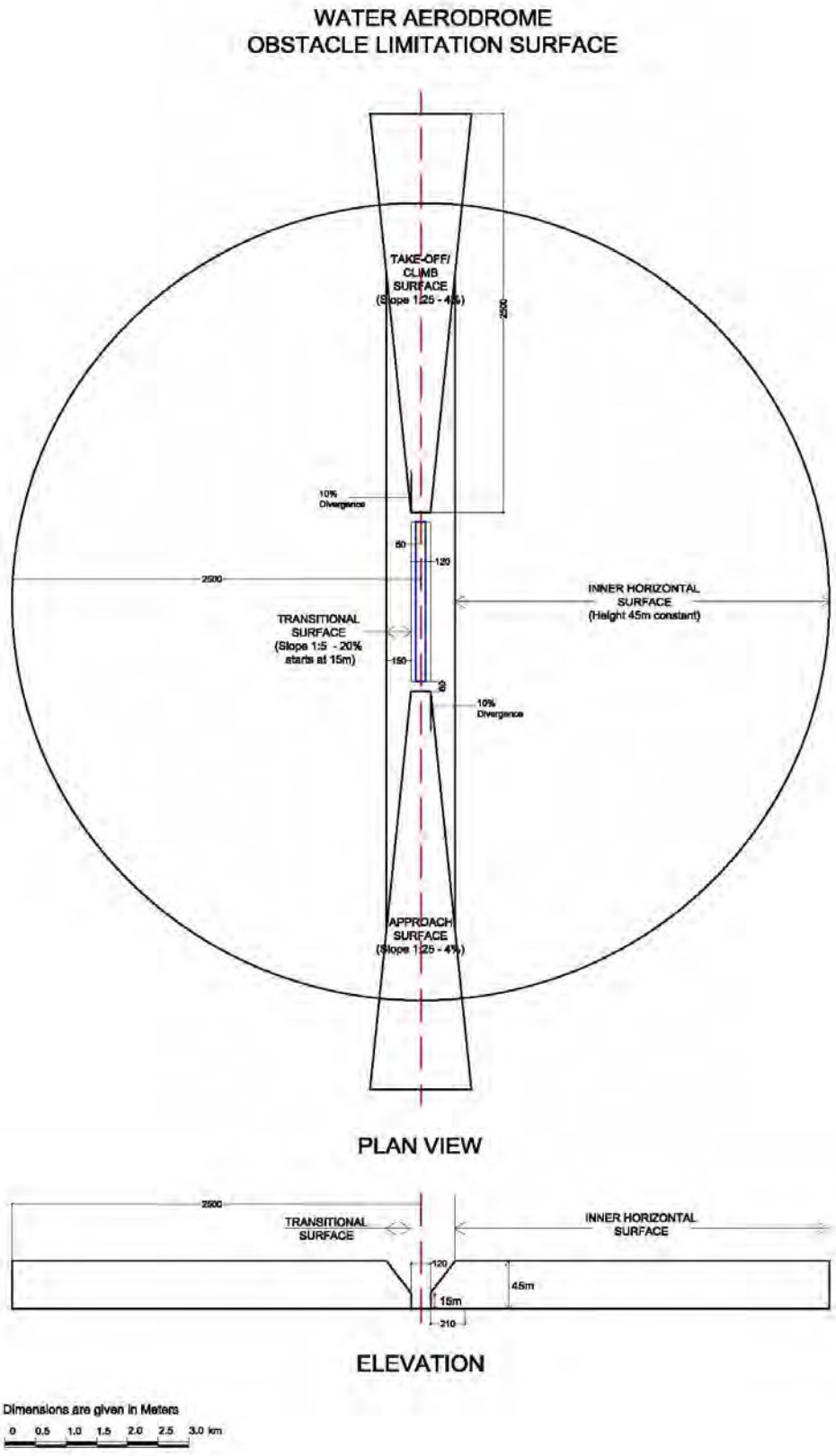
11 Appendices

11.1 Appendix 1 – Figure 1 – Obstacle Limitation Surface



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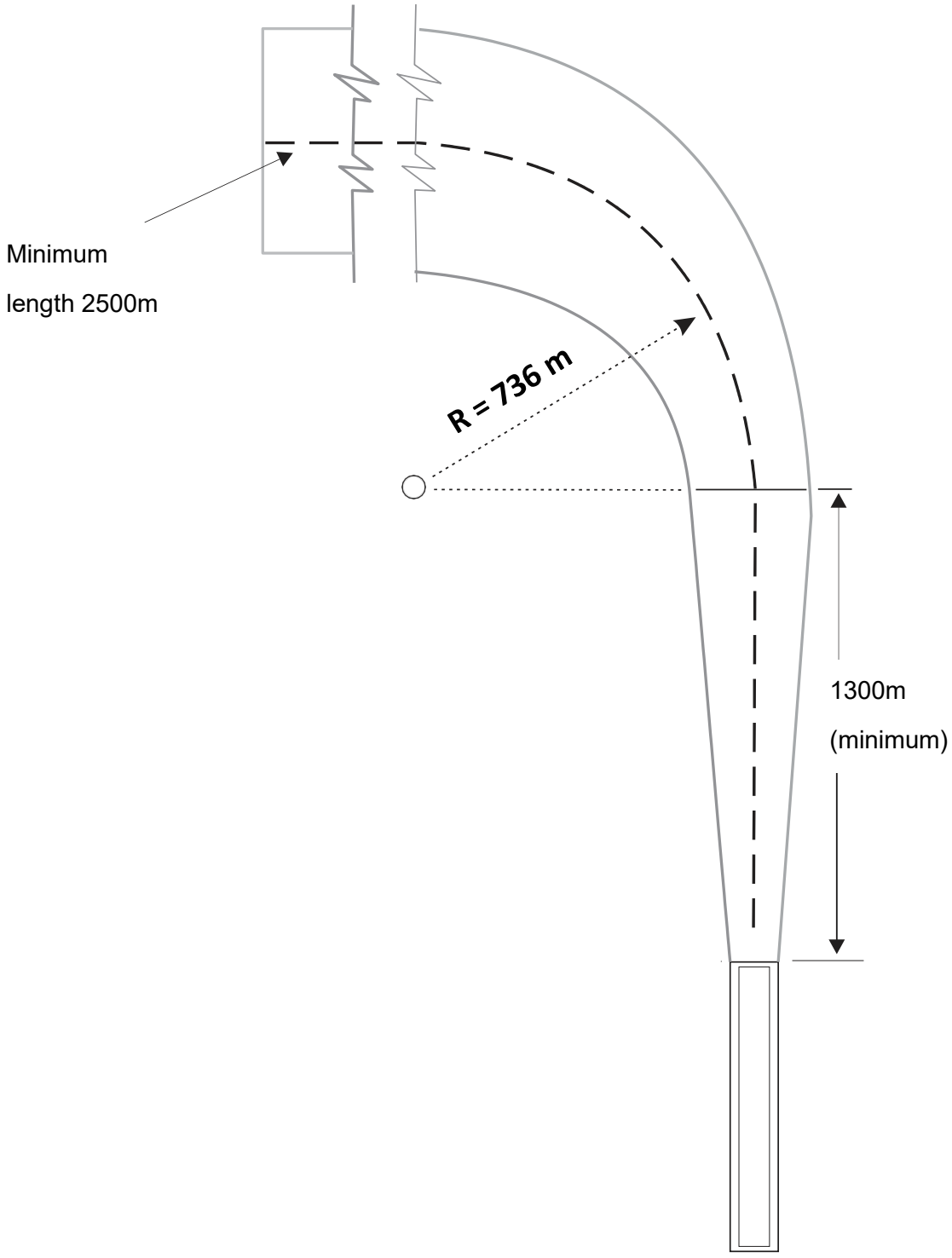
11.2 Appendix 2 – Figure 2 – Curved Take-Off Climb/Approach Surface



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