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GOVERNMENT OF INDIA
OFFICE OF DIRECTOR GENERAL OF CIVIL AVIATION

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AERODROME ADVISORY CIRCULAR ON VERTIPORT

Subject: Guidance Material for Design, Operation and Authorization of Vertiports.

1. Introduction

1.1 The rapid evolution of vertical take-off and landing (VTOL) and short take-off and landing (STOL) aircraft necessitates the development of specialized infrastructure to support their unique operational requirements.

1.2 This guidance material aims to provide comprehensive design and operational guidance for vertiports, ensuring the safe and efficient integration of unconventional VTOL/STOL aircraft into urban and rural environments. This Advisory Circular (AC) also aims to provide guidance to all stakeholders in this area.

1.3 This Advisory Circular is issued under the provisions of Rule 78 of The Aircraft Rules-1937.

1.4 This circular is based upon SARPs/Guidance Materials contained in ICAO Annex-14 Vol 2, ICAO Doc 9261, Doc 9981 & Doc 9137, DGCA CAR Section 4 Series B Part I, DGCA CAR Section 4 Series B Part III and guidance material published by other regulatory authorities.

2. Applicability and Scope

2.1 A Vertiport Authorization may be granted to following:

(a) a citizen of India; or
(b) a Company or a body corporate: Provided that-
  (i) It is registered and having its principal place of business in India;
  (ii) It meets the equity holding criteria specified by the Central Government from time to time; or
(c) the Central Government or a State Government or any company or any corporation owned or controlled by either of the said Governments; or
(d) A society registered under the Societies Registration Act, 1860. (21 of 1860).

2.2 For design, development and operation of Vertiport under public use[1] and/ or private use[2] of vertical take-off and landing (VTOL) and short take-off and landing (STOL) capable aircraft that is

(a) powered by unconventional power source;
(b) weight (MTOW) less than 5700 kg;
(c) operated by a pilot;
(d) Operated under day VFR flight conditions*; [*Ref: Section 9 Series C Part 1].

2.3 Vertiport owners and operators should also refer to local, state and other government agencies requirements to ensure appropriate adherence to their requirements. (Appropriate stakeholders' reference is as per CAR Section 4 Series F Part III).

2.4 The existing Heliports/Airports/Runway/ Airstrips may also be developed as Vertiports following this ADAC. In such cases, authorization of vertiport operation would be additional to existing authorisation (if any).

3. Acronyms and Definitions

Note. — These Acronyms/ definitions are specific to this advisory circular.

3.1 Acronyms

AAM	-	Advanced Air Mobility
AC	-	Advisory Circular
ADAC	-	Aerodrome advisory circular
AFM	-	aircraft flight manual
AIP	-	aeronautical information publication
CAR	-	Civil Aviation Requirements
FATO	-	final approach and take-off area
FOD	-	foreign object debris
FPA	-	FATO protection area
ICAO	-	International Civil Aviation Organization
LDAV	-	landing distance available (SCA)
LDRV	-	landing distance required (SCA)
MTOW	-	maximum take-off weight
OFV	-	obstacle free volume
OLS	-	obstacle limitation surface
RFFS	-	rescue and fire fighting services
RTO	-	rejected take-off
RTOD	-	rejected take-off distance
RTODAV	-	rejected take-off distance available (SCA)
RTODRV	-	rejected take-off distance required (SCA)
RTODV	-	rejected take-off distance (SCA)
SA	-	safety area
SARPS	-	standards and recommended practices
SCA	-	STOL capable aircraft
STOL	-	Short Take-Off and Landing
TDP	-	take-off decision point

[1] Public use; the vertiport, which, when available for operation of VCA/ SCA, shall be so available to all persons on equal terms and conditions.

[2] Private use, that is to say, for use by the authorized person only. However, private use vertiport shall be available to all VCA/ SCA operation in case of emergency. Usage of Private use vertiports excludes the schedule operation.

TDPC	-	touchdown/positioning circle
TDPM	-	touchdown/positioning marking
TLOF	-	touchdown and lift off area
TODAV	-	take-off distance available (SCA)
TODRV	-	take-off distance required (SCA)
UCW	-	undercarriage width
VCA	-	VTOL capable aircraft
SCA	-	VTOL capable aircraft when operated as Aeroplane
VCA	-	VTOL capable aircraft when operated as Helicopter
VFR	-	visual flight rules
VMC	-	visual meteorological conditions
VPS	-	vertical procedure surface
VPT	-	vertiport
VRP	-	vertiport reference point
VTOL	-	vertical take-off and landing

3.2 Definitions

Charging facility or Charging Station means a facility/ station used for charging/ energizing the batteries used in a VCA/ SCA.

Clearway A defined area on the ground or water under the control of the appropriate authority, selected and/ or prepared as a suitable area over which a SCA may accelerate and achieve a specific height.

Commercial air transport operation means an aircraft operation involving the transport of passengers, cargo, or mail for remuneration or hire.

Congested area means, in relation to a city, town, or settlement, any area that is substantially used for residential, commercial, or recreational purposes.

Critical VCA. The critical aircraft is the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use [3] of the vertiport.

'***D***', for VCA/SCA, means the diameter of the smallest circle enclosing the VCA/SCA projection on a horizontal plane, while the aircraft is in the take-off or landing configuration, with rotor(s) turning.

Note. — If the VCA/SCA changes dimensions during taxiing or parking (e.g. folding wings), a corresponding D taxiing or D parking should also be provided.

Design D means the 'D' of the design VCA/SCA.

Design VCA/SCA means the VCA/SCA type that the vertiport is intended to serve, which has the largest set of dimensions, the greatest maximum take-off mass (MTOM), and the most critical obstacle avoidance criteria.

[3] Regular use is 500 annual operations, including both itinerant and local operations but excluding touch-and-go operations. An operation is either a take-off or landing. [ref: FAA AC no. 150/5000-17]

Dynamic load-bearing surface means a surface capable of supporting the loads that are generated by a VCA/SCA in motion.

Elevated vertiport. A vertiport located on a raised structure on land.

Elongated. When used with TLOF or FATO, elongated means an area which has a length morethan twice its width.

Essential objects permitted includes, but may not be limited to, around the touchdown and lift-off area (TLOF), perimeter lights and floodlights, guttering and raised kerb, Fire extinguishing system, handrails and associated signage, other lights.

E-VTOL. A vertical take-off and landing capable aircraft that uses distributed electric propulsion (more than two lift/thrust units) to hover, fly, take off and land.

Final approach and take-off area (FATO). A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by VCA/ SCA, the defined area includes the rejected take-off area available.

Landing distance available (LDAV), for VCA/ SCA, means the length of the FATO plus any additional area that is declared available and suitable for the VCA/ SCA to complete the landing manoeuvre from a defined height.

Landing distance required (LDRV) for SCA, means the horizontal distance that is required for landing and coming to a full stop from a point that is 15 m (50 ft) above the landing surface.

Obstacle means all fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of VCA/ SCA; extend above a defined surface intended to protect VCA/ SCA in flight; or stand outside those defined surfaces but, nonetheless, are assessed as a hazard to air navigation.

Protection area. A defined area surrounding a stand intended to reduce the risk of damage fromVCA/ SCA accidentally diverging from the stand.

Rejected take-off distance **(RTODV)**, for SCA, means the length of the final approach and take-off area (FATO) that is declared available and suitable for SCA to complete a rejected take-off in accordance with the category (enhanced or basic) in which the aircraft is operated.

Runway-type FATO. A FATO having characteristics similar in shape to a runway.

Safety area. A defined area on a vertiport surrounding the FATO which is free of obstacles, otherthan those required for air navigation purposes, and intended to reduce the risk of damage to VCA/ SCA accidentally diverging from the FATO.

Static load-bearing surface. A surface capable of supporting the mass of a VCA/SCA situated upon it.

STOL Capable Aircraft (SCA). A VTOL, other than aeroplane or helicopter, capable of performing short take-off and landing by means of more than two lift/thrust units that are used to provide lift during the take-off and landing.

Surface level vertiport. A vertiport located on the ground or on a structure on the surface of the water.

Take-off decision point (TDP) for VCA/ SCA, means the first point that is defined by a combination of speed and height from which continued take-off can be made meeting the

certified minimum performance (CMP) following a critical failure for performance (CFP), and is the last point in the take-off path from which a rejected take-off (RTO) is ensured.

Take-off distance available (TODAV) for VCA/SCA, means the length of the final approach and take-off area (FATO) plus the length of any clearway (if provided) that is declared available and suitable for VTOL/STOL-capable aircraft to complete the take-off.

Take-off distance required (TODRV) for VCA/SCA, means the projected horizontal distance from the start of the take-off to the point at which safe obstacle clearance and a positive climb gradient are achieved, following a critical failure for performance (CFP) recognized at the take-off decision point (TDP)

Taxiway. A defined path on a vertiport intended for the ground movement of VCA/SCA and that may be combined with an air taxi-route to permit both ground and air taxiing.

Taxi-route. A defined path established for the movement of VCA/SCA from one part of a vertiport to another.

a) An air taxi-route. A marked taxi-route intended for air taxiing.
b) A ground taxi-route. A taxi-route cantered on a taxiway.

Touchdown and lift-off area (TLOF). A load bearing area on which a VCA may touchdown or lift off.

Touchdown positioning circle (TDPC). A touchdown positioning marking (TDPM) in the form of a circle used for omnidirectional positioning in a TLOF.

Touchdown positioning marking (TDPM) circle means the reference marking for a normal touchdown, which is so located that when the pilot's seat is over the marking, the whole of the undercarriage will be within the touchdown and lift-off area (TLOF) and all parts of the VCA/SCA will be clear of any obstacles by a safe margin.

Touchdown positioning marking (TDPM). A marking or set of markings providing visual clues for the positioning of VCA.

VCA stand. A defined area intended to accommodate a VCA for purposes of loading or unloading passengers, mail or cargo; charging, parking or maintenance; and, where air taxiing operations are contemplated, the TLOF.

Vertiport elevation. The elevation of the highest point of the FATO.

Vertiport operator. Any legal person that is operating or intending to operate one or more vertiports.

Vertiport reference point (VRP). The designated location of a vertiport.

Vertiport. 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 VCA/ SCA.

VTOL-capable aircraft (VCA). A heavier-than-air aircraft, other than aeroplane or helicopter, capable of performing vertical take-off and landing by means of more than two lift/thrust units that are used to provide lift during the take-off and landing.

4. Common reference systems and Site Selection

4.1 Horizontal reference system

4.1.1 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system.

4.1.2 Reported aeronautical geographical coordinates (indicating latitude and longitude)shall be expressed in terms of the WGS-84 geodetic reference datum.

Note. — Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System — 1984 (WGS-84) ICAO Manual (Doc 9674).

4.2 Vertical reference system

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

Note 1. — 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.

Note 2. — Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

4.3 Temporal reference system

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

4.4 Site Selection

4.4.1 The Site approval for establishment of Vertiport shall be obtained as per procedure given in Para 11.

4.4.2 The selection of a vertiport site involves the consideration of a range of variables including intended aircraft types, area available, vertiport configuration and obstacle environment.

4.4.3 Site selection for proposed vertiport should consider suitability from- a land-use planning perspective, safety, access, and necessity etc. including any limitations or restrictions that could apply to the site.

4.4.4 The vertiport area available and the intended scope of operations may impact on the vertiport configuration. The number of facilities, such as FATOs, taxi routes, stands and associated buildings, may be limited by the physical environment.

4.4.5 The potential area for vertiports to be constructed in a complex wind (turbulent) environment means that specific considerations should be made when a vertiport is to be established in the vicinity of buildings, and significant terrain.

4.4.6 Where vertiports are located within the vicinity of other vertiports or Aerodromes/Heliport, or use of existing infrastructure, the siting and design of FATOs and their associated flight paths should carefully consider interactions between own vertiport traffic, and other vertiport and Aerodrome/Heliport traffic.

5. Vertiport Data

5.1 Aeronautical Data

5.1.1 Determination and reporting of vertiport related aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data.

5.1.2 Digital data error detection techniques may be used during the transmission and/ or storage of aeronautical data and digital data sets.

Note. — Detailed specifications concerning digital data error detection techniques are contained in PANS-AIM (Doc 10066).

5.2 Vertiport Reference Point

5.2.1 A vertiport reference point shall be established for a vertiport not co-located with an aerodrome.

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

5.2.3 The position of the vertiport reference point shall be measured and reported to the DGCA in degrees, minutes and seconds.

Note. — When the vertiport collocated with an aerodrome, the established aerodrome reference point serves both aerodrome and vertiport.

5.3 Vertiport dimensions and related information

5.3.1 The following data shall be measured or described, as appropriate, for each facility provided on a vertiport:

(a) **Vertiport type** — surface-level, elevated.
(b) **Touchdown and lift-off area** — dimensions to the nearest meter or foot, slope, surface type, bearing strength in Quintals (100 kg);
(c) **FATO** — type of FATO, true bearing to one-hundredth of a degree, designation number(where appropriate), length and width to the nearest meter or foot, slope, surface type;
(d) **Safety area** — length, width and surface type;
(e) **taxiway & taxi route**— designation, width, surface type;
(f) **Apron** — surface type, VCA/SCA stands;
(g) **Clearway (if Available)** — length, ground profile and
(h) Visual aids for approach procedures, marking and lighting (if available) of FATO, TLOF, VCA/SCA ground taxiways and VCA/SCA air taxiways and VCA/SCA stands.

5.3.2 The geographical coordinates of the geometric centre of the touchdown and lift-off area and/or of each threshold of the final approach and take-off area (where appropriate) shall be measured and reported to the DGCA in degrees, minutes, seconds and hundredths of seconds.

5.3.3 The geographical coordinates of appropriate centre line points of VCA/SCA taxiways and VCA/SCA taxi routes shall be measured and reported to the DGCA in degrees, minutes, seconds and hundredths of seconds.

5.3.4 The geographical coordinates of each VCA/SCA stand shall be measured and reported to the DGCA in degrees, minutes, seconds and hundredths of seconds.

5.3.5 The geographical coordinates of obstacles shall be measured and reported to the DGCA in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation, type, marking and lighting (if any) of obstacles shall be reported to the DGCA.

6. Vertiport declared distances

6.1 Declared distances

The following distances to the nearest meter should be declared, where relevant, for a vertiport for VTOL/STOL-capable aircraft:

(a) Landing distance available (LDAV),
(b) Landing distance required (LDRV),
(c) Rejected take-off distance available (RTODAV),
(d) Rejected take-off distance required (RTODRV),
(e) Take-off distance available (TODAV), and
(f) Take-off distance required (TODRV).

6.2 Co-ordination between ATS unit, pilot and vertiport operator

6.2.1 There should be a continuous communication facility established between ATS unit and vertiport operator and Pilot.

6.2.2 Following information shall be made available by the vertiport operator to Pilot/ ATS unit with a minimum of delay:

(a) Information on vertiport conditions;
(b) The operational status of associated facilities, services and navigation aids (if any) within their area of responsibility;
(c) Any other information considered to be of operational significance.

7. Physical Characteristics

7.1 General

7.1.1 A vertiport consists of set of essential components or defined areas as well as some optional components. These are the basic building blocks of a vertiport, as shown in Figure 1, and include:

(a) One or more FATO
(b) One or more touch down and lift-off areas (TLOF)
(c) Protection areas
(d) Taxiways and/or taxi-routes
(e) Parking stands
(f) Charging / energizing facility
(g) Other facilities

7.1.2 The following specifications are based on the design assumption that no more than one VCA will be in the FATO at the same time.

7.1.3 Further, it is also assumed that operations to/from a FATO in proximity to another FATO will not be simultaneous. If simultaneous operations are planned, appropriate separation distances between FATOs should be determined with due regard to issues such as downwash, flight paths and other airspace limitations.

7.1.4 Safety devices to mitigate the risk of fall from height at elevated vertiports should not penetrate the OLS or exceed the height of the protection area.

7.1.5 The provisions given in this section are common for surface-level & elevated Vertiports unless otherwise specified.

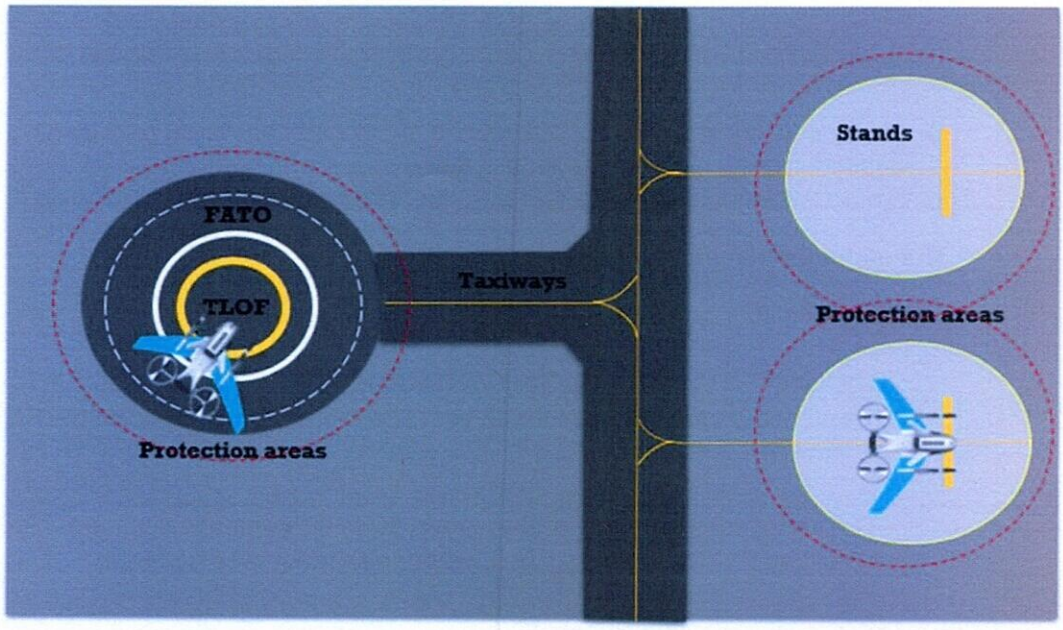


Figure 1: Vertiport Components

Note 1. — The specifications for ground taxi-routes and air taxi-routes are intended for the safety of simultaneous operations during the manoeuvring of VCAs. The effect of wind velocity/ turbulence induced by the rotor downwash would need to be considered.

Note 2. — The defined areas addressed in this section are taxiways and ground/air taxi-routes:

(a) Taxiways associated with air taxi-routes may be used by both wheeled and skidded VCAs for either ground or air taxiing.

(b) Ground taxi-routes are meant for use by wheeled VCAs, for ground taxiing only.

(c) Air taxi-routes are meant for use by air taxiing only.

7.2 Essential vertiport components

7.2.1 Final approach and take-off areas (FATO)

7.2.1.1 The FATO, surrounded by a safety area which need not be solid, should be located so as to minimize the influence of the surrounding environment, including turbulence, which could have an adverse impact on VCA/SCA operations.

7.2.1.2 When FATO is solid, the slope shall not exceed 2 per cent in any direction.

7.2.1.3 Essential objects, i.e. visual aids (e.g. lighting) or others (e.g. firefighting systems) necessary for safety purposes located in a FATO, shall not penetrate a horizontal plane at the FATO elevation by more than 5 cm.

7.2.1.4 **A FATO shall provide:**

(a) An area free of obstacles, except for essential objects which because of their function are located on it, and of sufficient size and shape to ensure containment of every part of the design VCA/SCA in the final phase of approach and commencement of take-off - in accordance with the intended procedures;

(b) When collocated with a TLOF, is contiguous and flush with the TLOF; has bearing strength capable of withstanding the intended loads; and ensures effective drainage; or

(c) When not collocated with a TLOF, is free of hazards should a forced landing be required; and be associated with a safety area.
(d) Vertiport shall be provided with at least one FATO, which need not be solid.

7.2.1.5 **The minimum dimensions of a FATO shall be:**

(a) Where intended to be used by SCA.

i. The length of the Rejected Take-Off Distance (RTOD) for the required Take-Off procedure prescribed in the Critical SCA flight manual for which the FATO is intended; and

ii. The width for the required procedure prescribed flight manual of the SCAs for which the FATO is intended, or 1.5 Design D, whichever is greater.

(b) Where intended to be used by VCA:

i. An area within which can be drawn a circle of diameter of 1.5 Design D; or,

ii. When there is a limitation on the direction of approach and touchdown, an area of sufficient width to meet the design requirement of VCA but not less than 1.5 times the overall width of the Critical VCA.

Note 1. — Guidance, on siting and orientation of the FATO at a vertiport to minimize interference of arrival and departure tracks with areas approved for residential use and other noise-sensitive areas close to the vertiport, may be taken from ICAO Doc 9261.

Note 2. — The RTOD is intended to ensure containment of the VCA during a rejected take-off. Although some flight manuals provide the RTOD, in others the dimension provided is the "minimum demonstrated … size" (where "…" could be "vertiport", "runway", etc.) and this may not include VCA containment. When this is the case, it is necessary to consider sufficient safety area dimensions, should the flight manual not deliver data. For further guidance see Heliport Manual (Doc 9261).

Note 3. — Local conditions, such as elevation, temperature, and permitted maneuvering may need to be considered when determining the size of a FATO. Guidance is given in the Heliport Manual (Doc 9261).

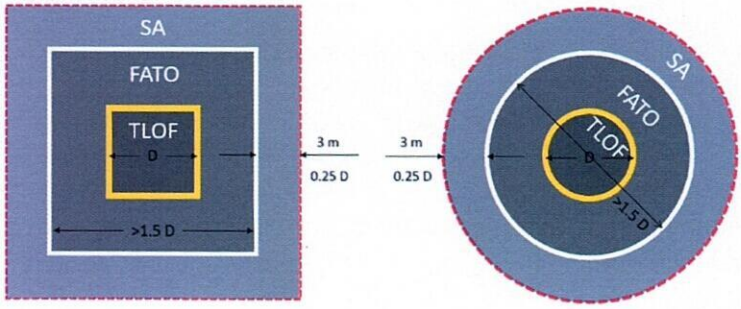


Figure 2: Dimensions of TLOF, FATO and Associated safety area

7.2.1.6 **Location of a final approach and take-off (FATO) area in an airport environment**

(a) Where a FATO is located near a runway or taxiway, and where simultaneous operations are planned, the separation distance between the edges of a runway or taxiway and the edge of a FATO shall not be less than the appropriate dimension in

(b)

(c) Table 1.

If VCA mass are	Distance between FATO edge and Runway edge or Taxiway edge
Up to but not including 3175 Kgs.	60 m
3175 Kgs up to but not including 5700 Kgs.	120m

Table 1: FATO minimum separation distance for simultaneous operation

(d) A FATO shall not be located:

i. Near taxiway intersections or holding points where jet engine efflux is likely to cause high turbulence; or

ii. Near areas where aero plane vortex wake generation is likely to exist.

7.2.2 **Safety Area (SA)**

7.2.2.1 The objective of SA is to provide a free of obstacles area that extends beyond the FATO, to compensate for manoeuvring errors under challenging environmental conditions.

7.2.2.2 **A safety area shall provide:**

(a) An area free of obstacles, except for essential objects which because of their function are located on it, to compensate for manoeuvring errors; and

(b) When solid, a surface which is contiguous and flush with the FATO; is resistant to the effects of rotor downwash; and ensures effective drainage.

7.2.2.3 The safety area surrounding a FATO shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 Design D, whichever is greater.

7.2.2.4 No mobile object shall be permitted in a safety area during VCA operations.

7.2.2.5 Essential objects located in the safety area shall not penetrate a surface originating at the edge of the FATO at a height of 25 cm above the plane of the FATO sloping upwards and outwards at a gradient of 5 per cent.

7.2.2.6 When solid, the slope of the safety area shall not exceed an upward slope of 4 per cent outwards from the edge of the FATO.

7.2.3 **Protected side slope**

7.2.3.1 A vertiport shall be provided with at least one protected side slope, rising at 45 degrees (diverging 12.5%) outward from the edge of the safety area and extending to a distance of 10 m (See Figure 3).

Recommendation. — A vertiport should be provided with at least two protected side slopes, rising at 45 degrees outward from the edge of the safety area and extending to a distance of 10 m.

7.2.3.2 The surface of a protected side slope shall not be penetrated by obstacles.

Note. — The below diagrams show a number of configurations of FATO/Safety Areas/Side slopes. For a more complex arrival/departure arrangement which consists of: two surfaces that are not diametrically opposed; more than two surfaces; or an extensive obstacle free sector (OFS) which abuts directly to the FATO, it can be seen that appropriate provisions are necessary to ensure that there are no obstacles between the FATO and/or safety area and the arrival/departure surfaces.

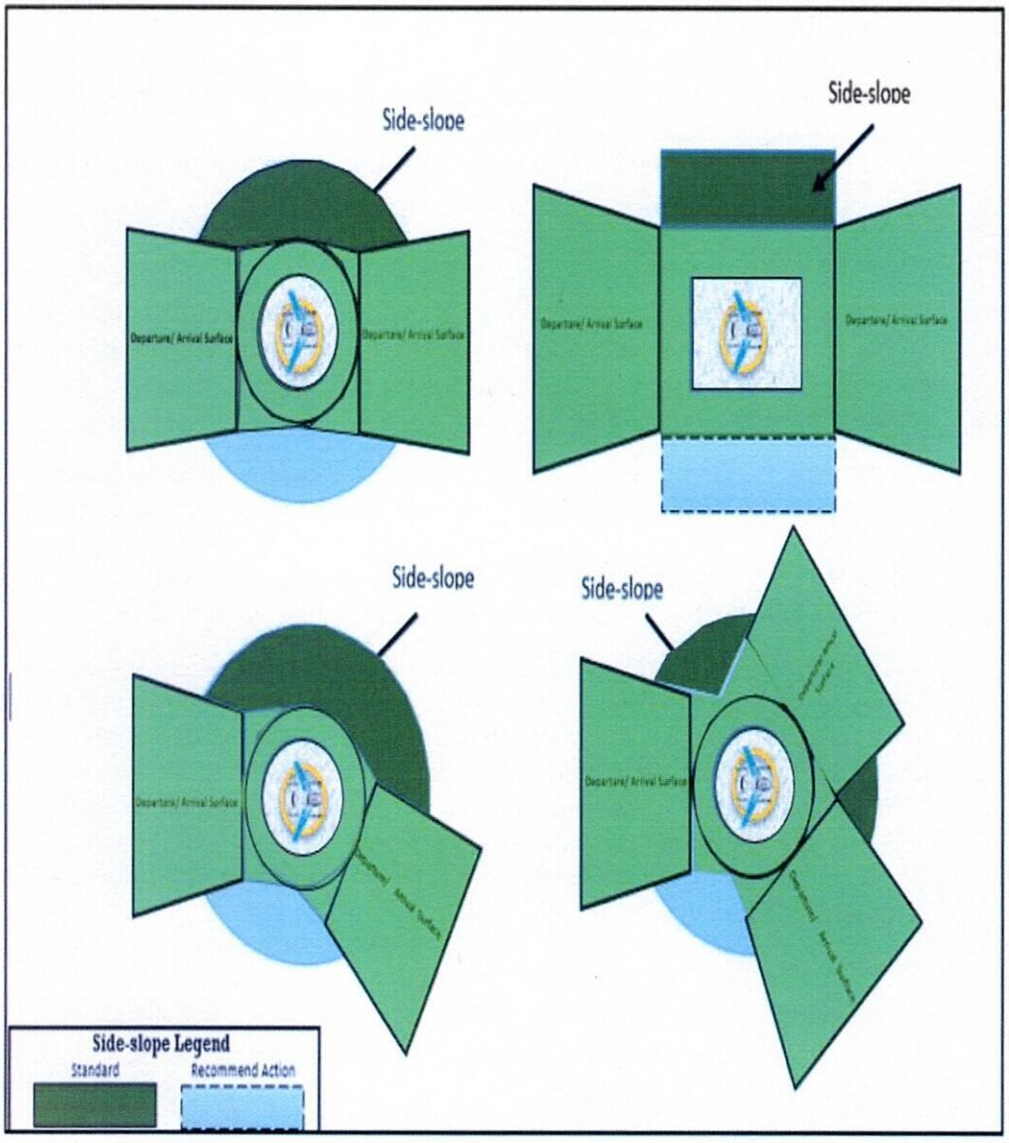


Figure 3: FATO Simple/ Complex safety area and side slope protection

7.2.4 **Touchdown and lift-off (TLOF) areas**

7.2.4.1 A vertiport should be provided with at least one TLOF.

7.2.4.2 A TLOF shall provide an area free of obstacles and of sufficient size and shape to ensure containment of the under carriage of the critical VCA the TLOF is intended to serve in accordance with the intended orientation.

7.2.4.3 A TLOF is a surface which:

(a) Has sufficient bearing strength to accommodate the dynamic loads associated with the anticipated type of arrival of the VCA at the designated TLOF.
(b) is free of irregularities that would adversely affect the touchdown or lift-off of VCAs;
(c) has sufficient friction to avoid skidding of VCAs or slipping of persons;
(d) is resistant to the effects of rotor downwash;
(e) ensures effective drainage while having no adverse effect on the control or stability of a VCA during touchdown and lift-off, or when stationary; and
(f) be associated with a FATO or a stand.

7.2.4.4 When there is limitation on the direction of touchdown, the minimum dimensions of a TLOF shall be the dimensions for the required procedure prescribed in the VCA flight manuals for which the TLOF is intended;

7.2.4.5 When there is no limitation on the direction of touchdown, the minimum dimensions of a TLOF shall be of sufficient size to contain a circle of diameter of at least 0.83 D of:

(a) in a FATO, the critical VCA; or
(b) in a stand, the design VCA, the stand is intended to serve;

7.2.4.6 When there is a limitation on the direction of touchdown, of sufficient width not less than twice the under-carriage width (UCW) of:

(a) in a FATO, the design VCA; or,
(b) in a stand, the critical VCA, the stand is intended to serve;

7.2.4.7 For an elevated vertiport, the minimum dimensions of a TLOF, when in a FATO, shall be of sufficient size to contain a circle of diameter of at least 1 Design-D.

7.2.4.8 **Slopes on a TLOF shall not:**

(a) Exceed 2 per cent in any direction;
(b) When the TLOF is elongated and intended to be used by SCA/ VCA (A), exceed 3 per cent overall.

7.2.4.9 When a TLOF is within a FATO it should be:

(a) Centered on the FATO; or
(b) For an elongated FATO, centered on the longitudinal axis of the FATO.

7.2.4.10 When a TLOF is within a stand, it shall be centered on the stand.

7.2.4.11 TLOF shall be provided with markings which clearly indicate the touchdown position and, by their form, any limitations on maneuvering.

7.2.4.12 Where an elongated FATO contains more than one TDPM, measures shall be in place to ensure that only one can be used at a time.

7.2.4.13 Where alternative TDPMs are provided they shall be placed to ensure containment of the undercarriage within the TLOF and the VCA within the FATO.

7.2.4.14 Safety devices such as safety nets or safety shelves shall be located around the edge of an elevated vertiport but shall not exceed the height of the TLOF.

Note 1. — When a TLOF in a FATO is larger than the minimum dimensions, the TDPM may be offset while ensuring containment of the under carriage within the TLOF and the VCA within the FATO.

Note 2. — The efficacy of the rejected take-off or landing distance will be dependent upon the VCA being correctly positioned for take-off.

7.3 Optional vertiport components

7.3.1 **Clearway**

7.3.1.1 **A clearway shall provide:**

(a) an area free of obstacles, except for essential objects which because of their function are located on it, and of sufficient size and shape to ensure containment of the design VCA when it is accelerating in level flight, and close to the surface, to achieve its safe climbing speed; and

(b) When solid, a surface which is contiguous and flush with the FATO, is resistant to the effects of rotor downwash; and is free of hazards if a forced landing is required.

7.3.1.2 When a clearway is provided, it shall be located beyond the end of the FATO.

(a) The width of a VCA clearway shall not be less than the width of the FATO and associated safety area.

(b) When solid, the ground in a VCA clearway shall not project above a surface having an overall upward slope of 3 per cent, the lower limit of this surface being a horizontal line which is located on the periphery of the FATO.

(c) An object situated in a VCA clearway, which may endanger VCAs in the air, should be regarded as an obstacle and shall be removed.

7.3.2 **Downwash/ Outwash protection**

7.3.2.1 The characteristics and impacts of VCA downwash and outwash type effects are still unknown, however Vertiport designers and operators will need to take into consideration their potential effects during the design process.

7.3.2.2 A general evaluation of downwash/outwash type impacts should be carried out. The evaluation should consider the VCAs downwash/outwash characteristics, the specific local conditions and relevant wind comfort criteria for affected persons and facilities.

7.3.2.3 A vertiport and its facilities should be designed and located to protect the following from damage or injurious effects of downwash/outwash type effects associated with VCA operating to/from the vertiport: – people – other aircraft – buildings – vehicles – equipment.

7.3.2.4 To avoid or reduce the potential of incidents and accidents associated with VCA downwash/outwash, downwash protection zones around vertiports in the form of boundaries, or areas of restriction/control on movement of persons during VCA operations, should be considered.

7.3.2.5 For vertiports that are elevated, the downwash protection area may need to be extended below the level of the FATO. A safety assessment should be conducted to determine whether such an extension is necessary.

7.3.3 **Taxiways**

Note 1. — A taxiway is intended to permit the surface movement of a wheeled VCA under its own power.

Note 2. — A taxiway can be used by a wheeled VCA for air taxi if associated with an air taxi-route.

7.3.3.1 A taxi way shall:

(a) provide an area free of obstacles and of sufficient width to ensure containment of the under carriage of the most demanding wheeled VCA the taxiway is intended to serve;
(b) provide a surface which:
  i. has bearing strength to accommodate the taxiing loads of the VCAs the taxiway is intended to serve;
  ii. is free of irregularities that would adversely affect the ground taxiing of VCAs;
  iii. is resistant to the effects of rotor downwash; and
  iv. Ensures effective drainage while having no adverse effect on the control or stability of a wheeled VCA when being maneuvered under its own power, or when stationary;
(c) be associated with a taxi-route.

7.3.3.2 The minimum width of a taxiway shall be two times the under-carriage width (UCW) of the most demanding VCA, the taxiway is intended to serve;

7.3.3.3 The transverse slope of a taxiway shall not exceed 2 per cent and the longitudinal slope should not exceed 3 per cent.

7.3.4 **Taxi-routes**

7.3.4.1 **A taxi-route shall provide:**

(a) an area free of obstacles, except for essential objects which because of their function are located on it, established for the movement of VCAs; with sufficient width to ensure containment of the largest VCA the taxi-route is intended to serve;

(b) When solid, a surface which is resistant to the effects of rotor downwash; and

(1) **When collocated with a taxiway**:
  i. Is contiguous and flush with the taxiway;
  ii. Does not present a hazard to operations; and
  iii. Ensures effective drainage; and
(2) **When not collocated with a taxiway**:
  i. is free of hazards if a forced landing is required.

7.3.4.2 No mobile object shall be permitted on a taxi-route during VCA operations.

7.3.4.3 When solid and collocated with a taxiway, the taxi-route shall not exceed an upward transverse slope of 4 per cent outwards from the edge of the taxiway.

7.3.4.4 **Ground taxi-routes**

(a) A VCA/SCA ground taxi-route shall have a minimum width of 1.5 x the overall width of the largest VCA/SCA it is intended to serve, and be centered on a taxiway (See Figure 4).

(b) Essential objects located in a VCA/SCA ground taxi-route shall not:

(1) be located at a distance of less than 50 cm outwards from the edge of the VCA/SCA ground taxiway; and

(2) Penetrate a surface originating 50 cm outwards of the edge of the VCA taxiway and a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

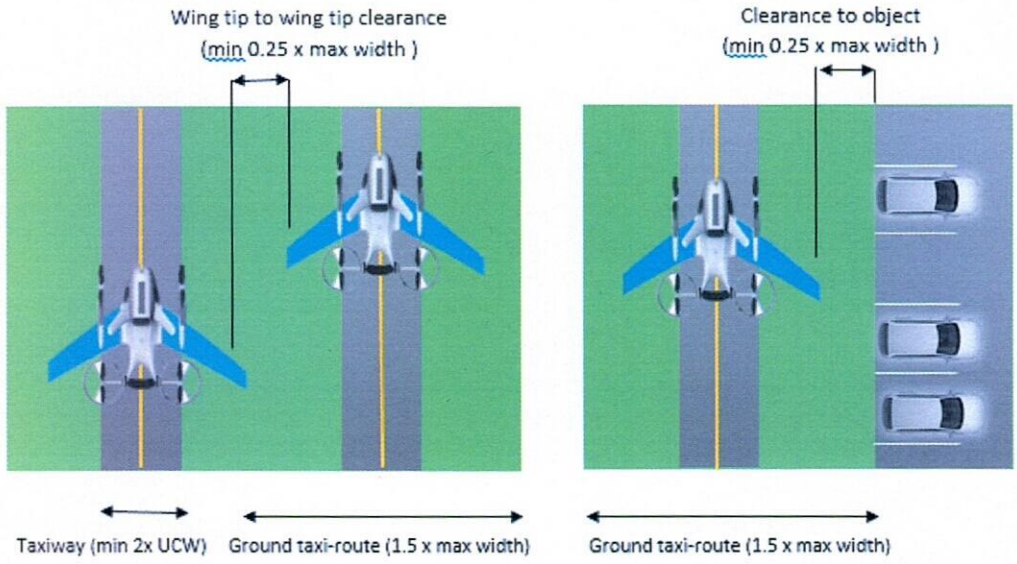


Figure 4: Taxiway and Taxi-Route

7.3.4.5 **Air taxi-routes**

Note. — An air taxi-route is intended to permit the movement of a VCA/SCA above the surface at a height normally associated with ground effect and at ground speed less than 37km/h (20 kt).

(a) An air taxi-route shall have a minimum width of twice the overall width of the largest VCA/SCA it is intended to serve.
(b) If collocated with a taxiway for the purpose of permitting both ground and air taxi operations (See Figure 5)
(c) air taxi-route shall be cantered on the taxiway;

7.3.4.6 Essential objects located in the air taxi-route shall not:

(a) be located at a distance of less than 50 cm outwards from the edge of the taxiway;
(b) Penetrate a surface originating 50 cm outwards of the edge of the VCA/SCA taxiway and a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

7.3.4.7 When an air taxi-route is not collocated with a taxiway, the slopes of the surface of an air taxi-route shall not exceed the slope landing limitations of the VCAs the taxi-route is intended to serve. In any event, the transverse slope shall not exceed 10 per cent and the longitudinal slope should not exceed 7 per cent.

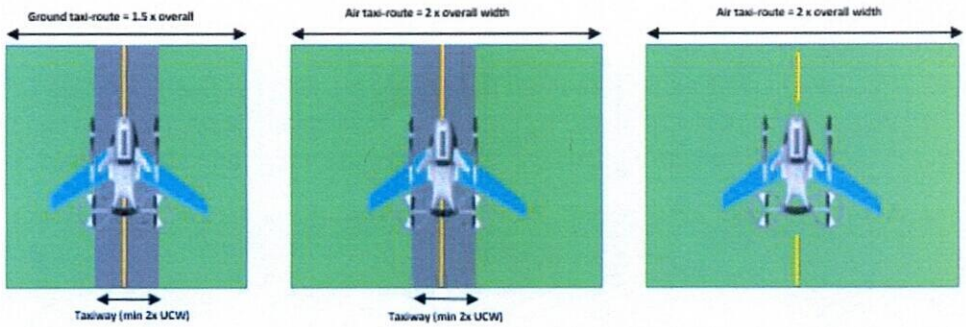


Figure 5: Air taxi-route and combined air taxi-route/ taxiway

7.3.5 **Stands**

7.3.5.1 **A stand shall:**

(a) provide an area free of obstacles and of sufficient size and shape to ensure containment of every part of the largest VCA/SCA the stand is intended to serve when it is being positioned within the stand;

(b) provide a surface which:
   i. is resistant to the effects of rotor downwash;
   ii. is free of irregularities that would adversely affect the maneuvering of VCAs;
   iii. has bearing strength capable of withstanding the intended loads;
   iv. Has sufficient friction to avoid skidding of VCAs or slipping of persons; and
   v. Ensures effective drainage while having no adverse effect on the control or stability of a wheeled VCA when being maneuvered under its own power, or when stationary; and

(c) Be associated with a protection area.

7.3.5.2 The minimum dimensions of a stand shall be:

(a) A circle of diameter of 1.2 D of the largest VCA/SCA , the stand is intended to serve; or

(b) When there is a limitation on manoeuvring and positioning, of sufficient width to meet, not less 1.2 times overall width of largest VCA the stand is intended to serve.

Note 1. — For a stand intended to be used for taxi-through only, a width less than 1.2D but which provides containment and still permits all required functions of a stand to be performed, might be used.

Note 2. — For a stand intended to be used for turning on the ground, the minimum dimensions may be influenced by the turning circle data provided by the manufacturer and are likely to exceed 1.2 D.

7.3.5.3 The mean slope of a stand in any direction shall not exceed 2 per cent.

7.3.5.4 Each stand shall be provided with positioning markings to clearly indicate where the VCA is to be positioned and, by their form, any limitations on manoeuvrings.

7.3.5.5 A stand shall be surrounded by a protection area which need not be solid.

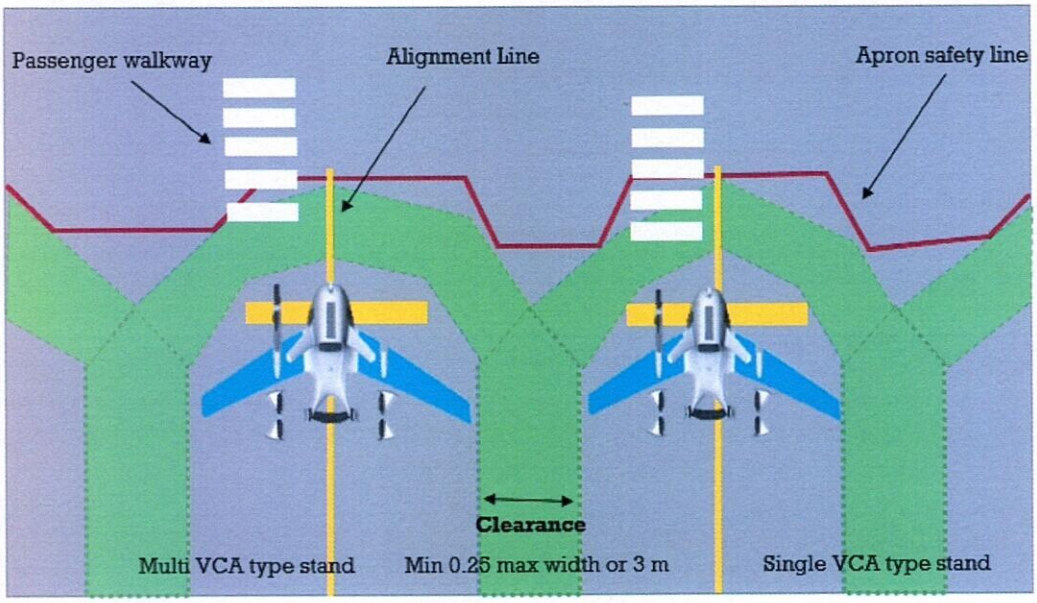


Figure 6: Example of geometry-based stands

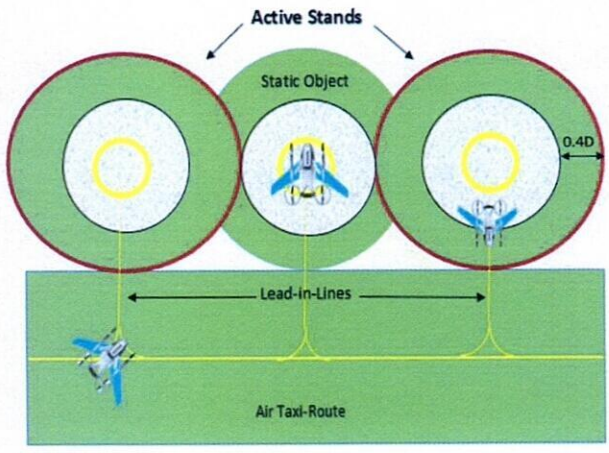
7.3.6 Protection areas

7.3.6.1 A protection area shall provide:

(a) an area free of obstacles, except for essential objects which because of their function are located on it; and

(b) When solid, a surface which is contiguous and flush with the stand; is resistant to the effectsof rotor downwash; and ensures effective drainage.

7.3.6.2 A protection area when associated with a stand designed for turning, the protection area shall extend outwards from the periphery of the stand for a distance of 0.4D. (See Figure 7).



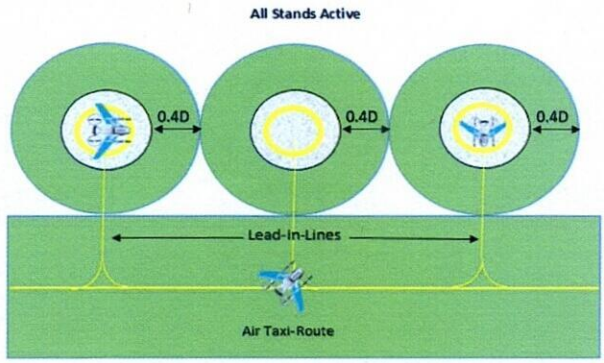


Figure 7: Turning stands with air taxi-routes simultaneous use

7.3.6.3 When associated with a stand designed for taxi-through, the minimum width of the stand and protection area shall not be less than the width of the associated taxi-route (See Figure 7 and Figure 8)

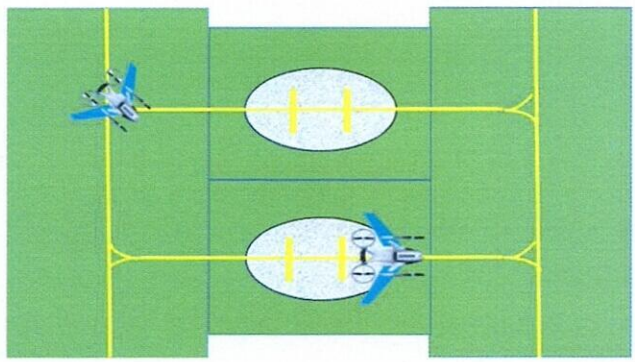


Figure 8: Ground taxi-through stands (with taxiway/ground taxi-route) simultaneous use

7.3.6.4 When associated with a stand designed for non-simultaneous use (See Figure 9 and Figure 10).

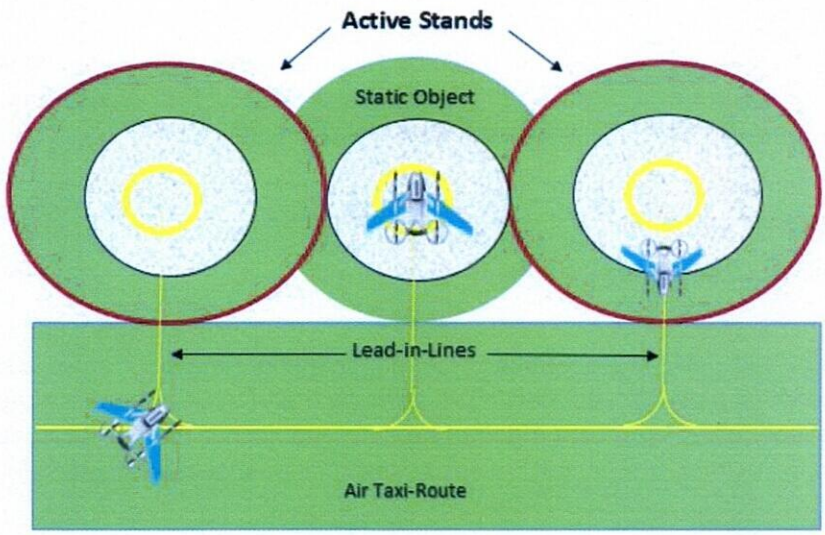


Figure 9: Turning stands (with air taxi-routes) — non simultaneous use – outer stands active

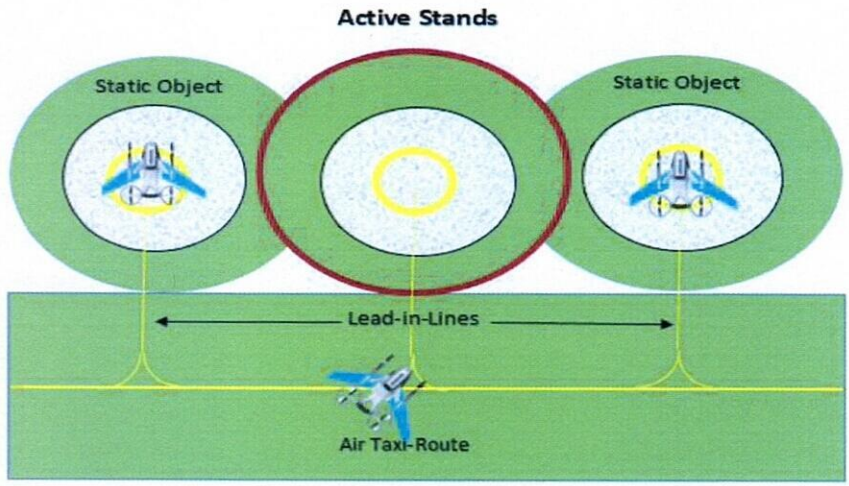


Figure 10: Turning stands (with air taxi-route) - non-simultaneous use – inner stand active

7.3.6.5 The protection area of adjacent stands may overlap but shall not be less than the required protection area for the larger of the adjacent stands;

7.3.6.6 The adjacent non-active stand may contain a static object but it shall be wholly within theboundary of the stand.

Note. — To ensure that only one of the adjacent stands is active at a time, instructions to be published.

7.3.6.7 No mobile object shall be permitted in a protection area during VCA operations.

7.3.6.8 **Essential objects located in the protection area shall not:**

(a) if located at a distance of less than 0.75 D from the centre of the stand, penetrate a surface at a height of 5 cm above the surface of the central zone; and

(b) If located at a distance of 0.75 D or more from the centre of the stand, penetrate a surface at a height of 25 cm above the plane of the central zone and sloping upwards and outwards at a gradient of 5 per cent.

7.3.6.9 When solid, the slope of a protection area shall not exceed an upward slope of 4 per cent outwards from the edge of the stand.

7.3.7 Charging/ Energizing Facilities

7.3.7.1 Charging station for VCA/SCA battery charging with required capacity may be provided at the vertiport. The charging station shall be as per norms/standards/specification laid down by the VCA/SCA manufacturers.

7.3.7.2 Battery charging must be done in a safe and secure manner as specified by the manufacturer. Any aircraft batteries stored on site should be stored safely away from TLOF, FATO, and Safety Areas.

7.3.8 Other facilities

7.3.8.1 The requirements for the provisions of hangar may be determined by the Vertiport operator.

7.3.8.2 The requirements for basic amenities, facilities for passengers, visitors and the pilots etc. maybe determined by the vertiport operator. The arrangement should be in such a way that safety and security of vertiport operation is not compromised.

8. Obstacle Limitation Surfaces (OLS)

8.1 General

A vertiport operator should establish the obstacle limitation surfaces (OLS) as applicable to the critical performance of the design VCA/SCA.

The dimensions of the OLS serve a general objective of protection of approach, climb-out and balked landing manoeuvre in the visual phase of the approach- to-land below a height of 152 m above the FATO elevation.

8.2 FATO Protection Area (FPA)

8.2.1 An FPA should be provided for each FATO, as shown in Figure 11.

8.2.2 An FPA should have the following features:

(a) Free of obstacles, except for essential objects.
(b) Where solid, flush with the edge of the FATO, resistant to the effects of downwash and ensures effective drainage.

8.2.3 Where a FATO supports landing/take-off without vertical procedures, the FPA is an area surrounding the FATO that encompasses:

(a) The area(s) bordered by a circumscribed square aligned with the landing/take-off flight path(s) cantered on the FPA reference circle(s).

(b) Any area contained within the direct common tangents of any multiple FPA reference circles.

8.2.4 Where a FATO supports landing/take-off with vertical procedures only, the FPA is an area surrounding the FATO that encompasses:

(a) The FPA reference circle(s)
(b) Any area contained within the direct common tangents of any multiple FPA reference circles.

8.2.5 The radius of an FPA reference circle should be half the FATO width plus 3 m or 0.25 Design D, whichever is greater.

8.2.6 Where the FATO length is greater than its width, separate FPA reference circles are cantered on the FATO centreline at a distance of half the FATO width from the FATO ends, as shown in Example C of Figure 11.

8.2.7 Essential objects located in the FPA should not exceed 25 cm in height and should be frangible mounted.

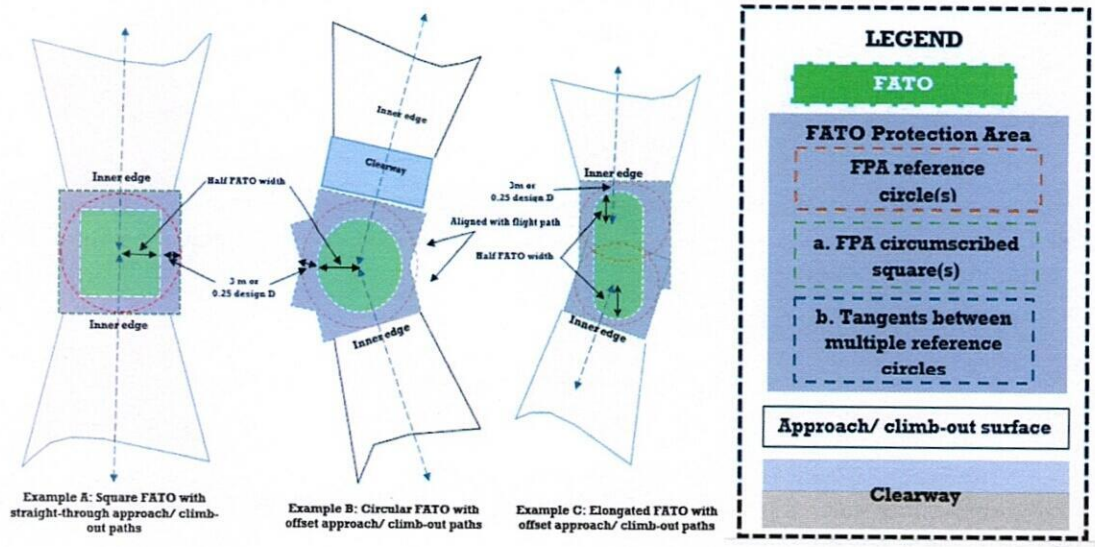


Figure 11: Protection surfaces for vertiports without vertical procedures

8.3 Vertical Procedure Surface (VPS)

8.3.1 A vertical procedure surface (VPS) should be established where vertical procedures are used for landing or take-off from the vertiport.

8.3.2 The VPS is a surface that encompasses the area bordered by a circumscribed square(s) aligned with the intended aircraft flight path(s) cantered on the VPS reference circle, as shown in figures below.

8.3.3 A VPS should be free of obstacles.

8.3.4 A VPS reference circle should be established above and cantered on the FATO.

8.3.5 The diameter of a VPS reference circle should be the diameter of the associated FPA reference circle, plus 1 Design D per 100 ft. increase in height above the FATO.

8.3.6 The vertiport operator should determine the elevation of the VPS subject to the performance characteristics of the most demanding VCA intended to use the vertiport or the VCA operator's intended operational requirements.

8.4 Obstacle Free Volume (OFV)

The objective of OFV is to provide protection above vertiports to facilitate the introduction of vertiports in congested areas and an obstacle populated environment for VCA/ SCA.

8.4.1 An OFV should be established between a VPS and the associated FPA.

8.4.2 An OFV should be free of obstacles.

8.4.3 The OFV is a truncated cone extending between the edges of the FPA reference circle to the edge of the VPS reference circle, as shown in Figure 12.

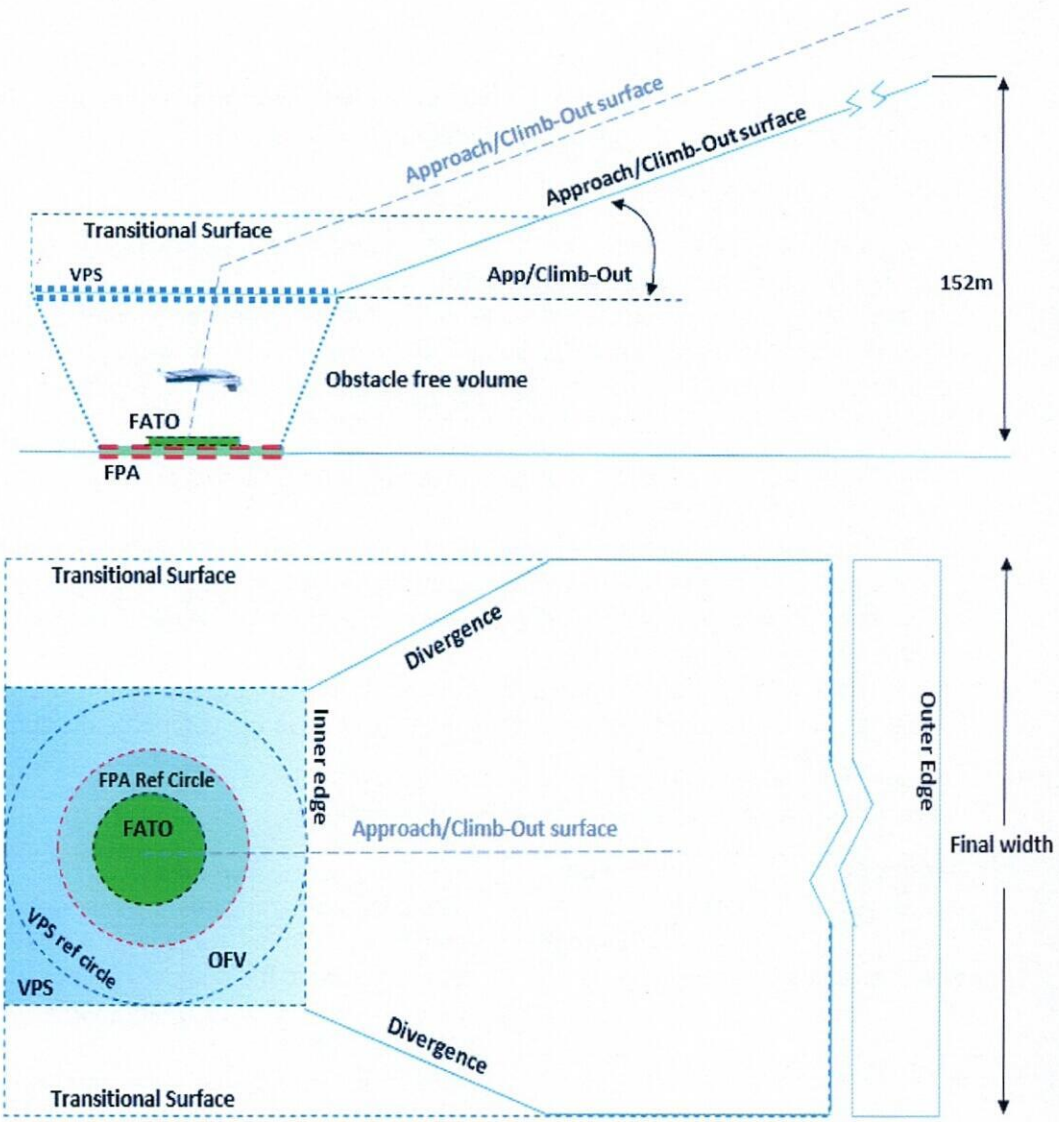


Figure 12: An example OLS design for a vertiport accommodating vertical procedures

8.5 Vertiport clearway

8.5.1 A vertiport clearway should be established when a VCA needs to manoeuvre horizontally, between the FPA/VPS outer edge and the approach/climb-out surface inner edge.

8.5.2 A vertiport clearway should have the following features:

(a) Sufficient size and shape to ensure containment of the design aircraft when it is
(b) operating between the FPA/VPS and the approach/climb-out surface
(c) Free of obstacles, except for essential objects
(d) resistant to the effects of downwash
(e) When at ground level, contiguous surface flush with the FPA, and free of hazards should a forced landing be required.

8.5.3 The width of a vertiport clearway should not be less than that of the associated FPA/VPS and cantered on the intended flight path.

8.6 Approach/Climb-Out Surface

8.6.1 An approach/climb-out surface should be established as far as practicable for each approach and climb-out flight path to and from the vertiport.

8.6.2 The approach/climb-out surface consists of an inclined plane or a combination of planes or, when turns are involved, a complex surface, sloping upwards from the inner edge and cantered on the intended flight path that must be clear of obstacles.

8.6.3 The limits of an approach/climb-out surface should comprise:

(a) An inner edge coincident with and of equal length to the outer edge of the associated FPA/VPS/clearway

(b) Two side edges originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane, aligned with the intended flight path to a specified width and continuing thereafter at that width for the remaining length of the approach/climb-out surface

(c) An outer edge horizontal and perpendicular to the centre line of the approach surface intended flight path at a specified height above the vertiport elevation.

8.6.4 The specified values of the above characteristics are outlined in Table 2: OLS surface values - Approach/climb-out surface characteristics below.

Characteristics	Value	Remarks
Inner edge width:	**Width of FPA/VPS/clearway**	The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, bring the VCA/SCA to 152 m (500 ft) above FATO elevation. This length may be reduced if vertical procedures are in place. When the VCA/SCA procedure includes the lateral element, the transitional surface may be provided
Day use only- final width:	7x Design D	
Day use only- divergence:	10%	
Outer edge height above FATO elevation	500' (152 m)	

Table 2: OLS surface values - Approach/climb-out surface characteristics

8.6.5 In the case of an approach/climb-out surface involving turns, the surface is a complex surface containing the horizontal normal to its centre line and the slope of the centre line should be the same as that for a straight approach surface.

8.6.6 The slope(s) of the approach/climb-out surface should be measured in the vertical plane containing the centre line of the surface.

8.6.7 The approach/climb-out surface slope or combination of slopes and section lengths should be determined with reference to the obstacle environment and intended aircraft performance capabilities. If multiple slope/sections are established, the divergent portion of the approach/climb-out surface should be a single consistent slope.

8.7 Transitional surface

8.7.1 A transitional surface should be established on each side of an approach/climb-out surface where provided and its associated clearway/VPS/FPA.

8.7.2 The transitional surfaces should be clear of obstacles.

8.7.3 The transitional surface should comprise:

(a) A lower edge beginning at the point on the outer edge of the approach/climb-out surface where it reaches its final width then extending downwards and along the side of the approach/climb-out surface to the inner edge and from there
(b) Where provided, along the side of the clearway parallel to intended flight path
(c) Along the length of the side of the VPS
(d) Along the length of the side of the FPA parallel to the intended flight path
(e) An upper edge beginning at the point where the outer edge of the approach/climb-out surface reaches its final width and then parallel to the intended flight path at a constant height.

Note. — As the transitional surface is dependent on the approach/climb-out angle and Design D, it may extend the full length of the approach/climb-out surface. It may also be impacted by the extent of any vertical procedure such that it is no longer present.

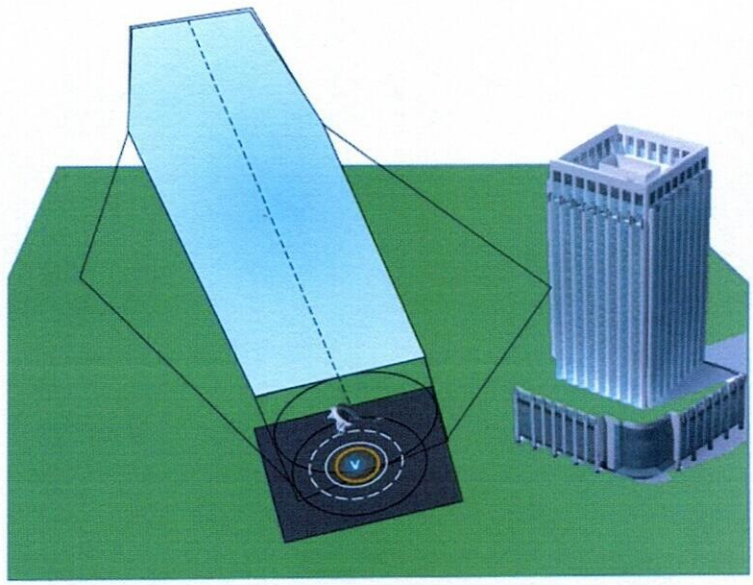


Figure 13: Illustration of a simple vertiport OLS. Showing an OFV, VPS, VPS reference circle, a single approach/climb-out surface and transitional surfaces

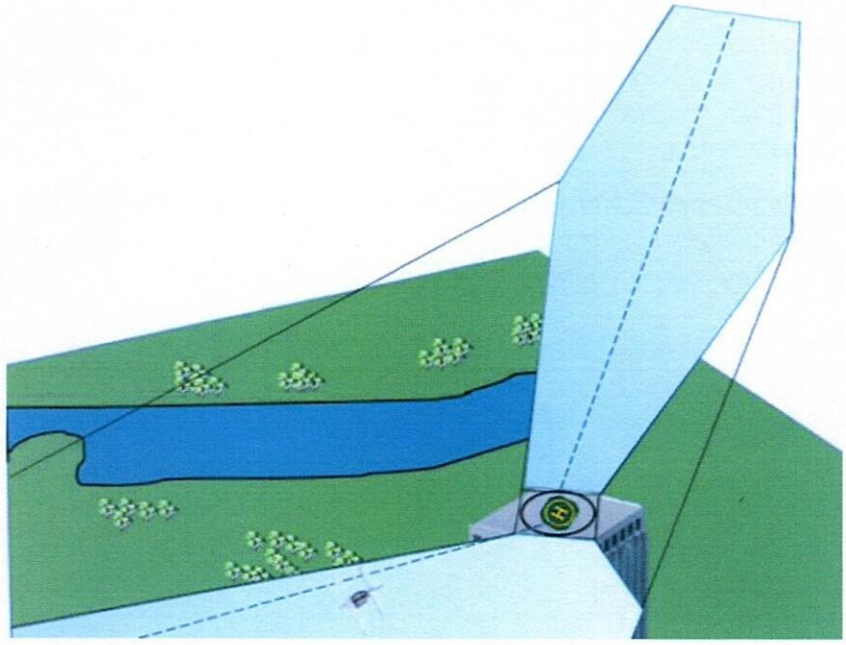


Figure 14: Illustration of a simple elevated vertiport OLS. Showing an FPA, dual approach/climb-out surfaces and transitional surfaces

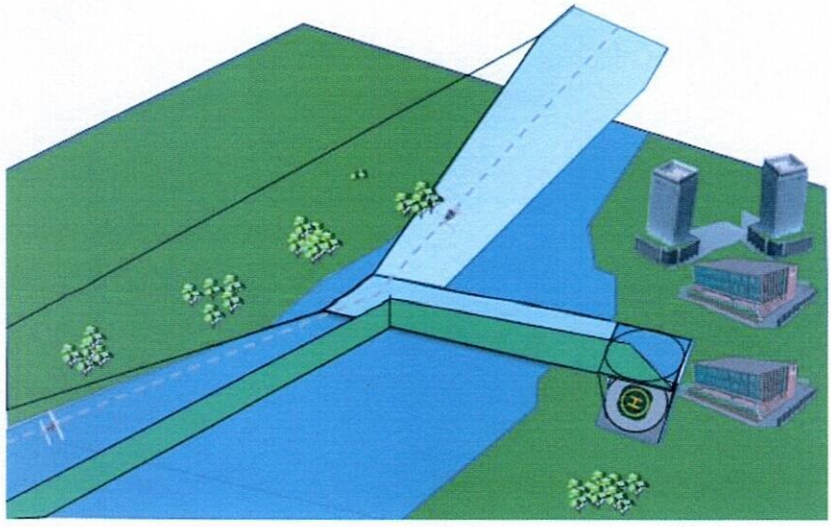


Figure 15: Illustration of a complex vertiport OLS. Showing an FPA, OFV, FPA, clearway, dual approach/climb-out surfaces over the river and transitional surface

9. Visual Aids

9.1 Wind direction indicators (WDI)

9.1.1 A vertiport shall be equipped with at least one wind direction indicator.

9.1.2 A wind direction indicator shall be located so as to indicate the wind conditions over the FATO and TLOF and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It shall be visible from a VCA in flight, in a hover or on the movement area.

9.1.3 Where a TLOF and / or FATO may be subject to a disturbed air flow, then additional wind direction indicators located close to the area shall be provided to indicate the surface wind on thearea.

9.1.4 A wind direction indicator shall be constructed so that it gives a clear indication of the direction of the wind and a general indication of the wind speed.

9.1.5 An indicator shall be a truncated cone made of lightweight fabric and shall have the following minimum dimensions:

Dimensions of WDI	Surface level vertiport	Elevated vertiports
Length	2.4 m	1.2 m
Diameter (Larger end)	0.6 m	0.3 m
Diameter (Smaller end)	0.3 m	0.15 m

Table 3: Dimensions of WDI

9.1.6 The colour of the wind direction indicator shall be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft.) above the vertiport, having regard to background. Where practicable, a single colour, preferably white or orange, shall be used. Whereas combination of two colours is required to give adequate conspicuity against changing backgrounds, they shall preferably be orange and white, red and white, or black and white, and shall be arranged in five alternate bands the first and last band being the darker colour.

Note. — Wherever a colour is referred to, the specifications for that colour given in Appendix 1 to DGCA CAR Section 4, Series B Part-I, shall apply.

9.2 Vertiport Beacon

9.2.1 A vertiport beacon shall be provided at a vertiport where:

(a) Long-range visual guidance is considered necessary and is not provided by other visual means; or
(b) Identification of the vertiport is difficult due to surrounding lights.
(c) The vertiport beacon shall be located on or adjacent to the vertiport preferably at an elevated position and so that it does not dazzle a pilot at short range.
(d) The vertiport beacon shall emit repeated series of equi-spaced short duration white flashes in the format in Figure 16: Vertiport Beacon Flash Characteristics.
(e) The light from the beacon shall show at all angles of azimuth.
(f) The effective light intensity distribution of each flash shall be as shown in Figure below.

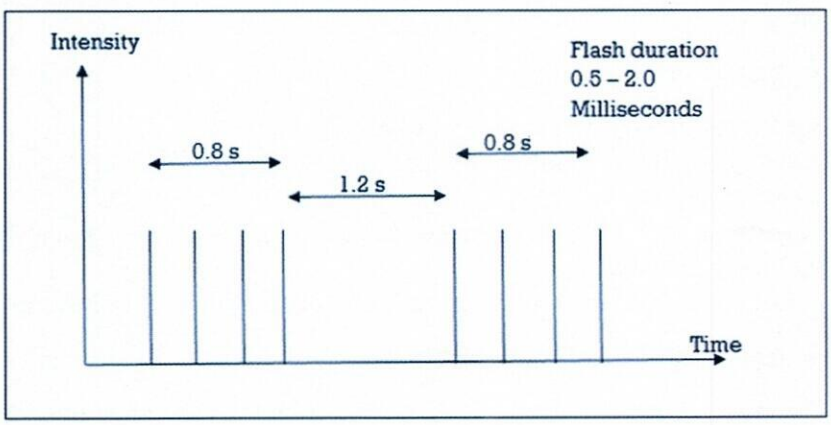


Figure 16: Vertiport Beacon Flash Characteristics

9.3 Vertiport identification marking

9.3.1 Vertiport identification markings shall be provided at a vertiport. A vertiport identification marking may be provided within a FATO, as shown in Figure 17.

9.3.2 On a FATO which contains a TLOF, a vertiport identification marking shall be located in the FATO so the position of it coincides with the centre of the TLOF.

9.3.3 Where a TDPC is provided, the vertiport identification marking should be in the centre of the TDPC. Otherwise, the vertiport identification marking should be located at or near the centre of the FATO.

9.3.4 A vertiport identification marking should have the following characteristics:

(a) A form that identifies the vertiport
(b) Have colour(s) that do not conflict with or detract from the TDPC where used
(c) Have a size that not less than 3 m and not greater than 0.5 Design D in its longest dimension
(d) Have a form that allows the marking to be aligned with the preferred landing direction.

9.3.5 The use of the letter "H" and "X" should be avoided as to not conflict with the heliport identification marking and an unserviceability marking. Markings with a white cross should also be avoided.

Note. — The vertiport identification marking need not be limited to a single form for all vertiports, however the marking used should be consistent across a facility. For example, a vertiport operator may choose to use a vertiport identification marking defined by another aviation authority, or they may choose to use a corporate logo or brand.

9.3.6 Where a vertiport is equipped with two or more FATOs, vertiport identification markings may be supplemented or replaced with an ordinal number marking.

9.3.7 An ordinal number marking should consist of the following characteristics:

(a) Arranged as to be readable from the preferred landing direction
(b) A number, beginning with 1 and ending in the last of the numbered FATOs
(c) Have a colour consistent with the vertiport identification marking
(d) Have a size not less than 1.5 m and not greater than 0.5 Design D in its longest dimension.

9.3.8 Vertiport name marking

(a) A vertiport name marking may be provided at a vertiport.
(b) A vertiport name marking should consist of the name or the alphanumeric designator of the vertiport.
(c) A vertiport name marking intended for use at night should be illuminated, either internally or externally.
(d) The characters of the marking should be not greater than 1.2 m in height.

9.3.9 Maximum allowable weight marking

(a) A maximum allowable weight marking may be displayed to provide the weight limitation of the TLOF.
(b) A maximum allowable weight marking should be located within the TLOF.
(c) A maximum allowable weight marking should consist of a one-, two- or three-digit number.

(d) The maximum allowable weight should be expressed in quintals to the nearest 10 kg. The marking should be presented to one decimal place and rounded to the nearest 10 kg followed by the letter 'q'.
(e) The maximum allowable weight marking should consist of the following characteristics:
    i. Arranged as to be readable from the preferred landing direction
    ii. Have a size that not less than 0.6 m in its longest dimension.

9.3.10 D-Value marking

(a) A D-value marking may be displayed to provide the pilot with the limiting D of the FATO or TLOF.
(b) A D-value marking should be located within the FATO or TLOF and so arranged as to be readable from the preferred landing direction(s).
(c) The D-value marking should be rounded to the nearest whole meter with 0.5 rounded down.
(d) The D-Value marking should consist of the following characteristics:
    i. Arranged as to be readable from the preferred landing direction
    ii. Have a size that not less than 0.6 m in its longest dimension

9.3.11 Vertiport marking examples (See Figure 17)

Example 1 illustrates an example of marking a FATO on a natural surface and includes:

- FATO – Natural surface. White flush markers (1.5m x 0.3m)
- TLOF – Grey painted square with edge marked by continuous white line (>0.3m)
- TDPM – Always an internal diameter 0.5 of Design D. Marked by a continuous yellow circle (0.5-1m wide)
- vertiport identification –white V on a blue background
- D-Value and maximum allowable weight markings.

Example 2 illustrates an example of marking a FATO on a paved surface and includes:

- FATO – Light coloured paving. White markings (1.5m x 0.3m) with black outline for contrast with paving
- TLOF – Green painted circle with edge marked by continuous white line (>0.3m) and a black outline for contrast with paving
- TDPM – Always an internal diameter 0.5 of Design D. Marked by a continuous yellow circle (0.5-1m wide)
- vertiport Identification- none
- 2 types of flight path alignment guidance markings.

Example 3 illustrates an example of marking a FATO with an aiming point & stand and includes:

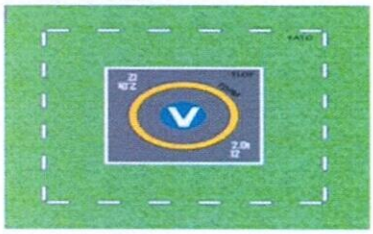
- FATO – Natural surface. White flush markers (1.5m x 0.3m)
- Air-taxi route markers – 1.5 m x 0.15 m yellow markers
- TLOF – Mesh deck with edge marked by continuous white line (>0.3m)
- TDPM – Internal diameter 0.5 of Design D, marked by a continuous yellow circle (0.5-1m wide)
- vertiport identification – none
- Flight path alignment – white arrow markings.

Example 4 illustrates an example of marking a FATO on a paved surface and includes:

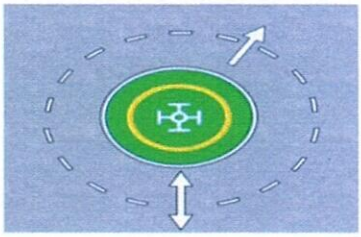
- FATO – Self-evident as dark paving against light concrete

- TLOF (at 1 Design D) – Painted paved octagon with edge marked by continuous white line (>0.3m.)
- TDPM – Internal diameter 0.5 of Design D marked by a continuous yellow circle (0.5-1m wide)
- vertiport identification – Corporate logo with ordinal number
- Vertiport name marking.

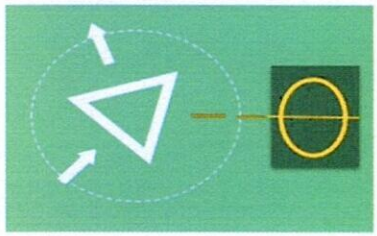
Note. — The figures below are examples only and does not limit possible marking combination on a natural surface.



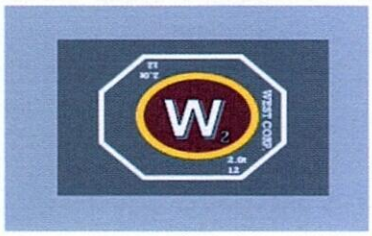
Example 1



Example 2



Example 3



Example 4

Figure 17: Vertiport marking examples

Note 1. — The objective of a vertiport identification marking is to provide to the pilot an indication of the presence of a vertiport and, by its form, likely usage; the preferred direction(s) of approach; or the FATO orientation within the vertiport obstacle environment.

Note 2. — For other than vertiports, the preferred direction(s) of approach corresponds to the median of the departure/arrival surface(s).

10. Vertiport Emergency Response, Safety and Security Plan

10.1 Vertiport Emergency Planning

Vertiport emergency planning is the process of preparing a vertiport to cope with an emergency that takes place at the vertiport or in its vicinity. Examples of emergencies include crashes on or off the vertiport, medical emergencies, dangerous goods occurrences, fires and natural disasters etc.

The purpose of vertiport emergency planning is to minimize the impact of an emergency by savinglives and maintaining VCA operations.

10.1.1 A vertiport emergency plan shall be established commensurate with the VCA operations and other activities conducted at the vertiport.

10.1.2 The plan shall identify agencies which could be of assistance in responding to an emergency at the vertiport or in its vicinity.

10.1.3 The vertiport emergency plan shall provide for the coordination of the actions to be taken in the event of an emergency occurring at a vertiport or in its vicinity.

10.1.4 Where an approach/departure path at a vertiport is located over water, the plan shall identify which agency is responsible for coordinating rescue in the event of a VCA ditching and indicate how to contact that agency.

10.1.5 The plan shall include, as a minimum, the following information:

(a) The types of emergencies planned for;
(b) How to initiate the plan for each emergency specified;
(c) The name of agencies on and off the vertiport to contact for each type of emergency withtelephone numbers or other contact information;
(d) The role of each agency for each type of emergency;
(e) A list of pertinent on-vertiport services available with telephone numbers or other contactinformation;
(f) Copies of any written agreements with other agencies for mutual aid and the provision ofemergency services; and
(g) A grid map of the vertiport and its immediate vicinity.

10.1.6 All agencies identified in the plan shall be consulted about their role in the plan.

10.1.7 The plan shall be reviewed and the information in it updated at least yearly or, if deemed necessary, after an actual emergency, so as to correct any deficiency found during actual emergency.

10.1.8 A test of the emergency plan shall be carried out at least once every three years starting from the day of Authorization.

10.2 Rescue and fire fighting

The fire fighting techniques for VCA may differ from model to model. Providing adequate fire protection for VCA on vertiports will require a full understanding of the hazards related to the specific aircraft that will be using the vertiport. This also applies to the utility infrastructure needed to charge the VCA.

10.2.1 Rescue and fire fighting equipment and services shall be provided at vertiports and at elevated vertiports located above occupied structures.

10.2.2 A safety risk assessment and Task Resource Analysis (TRA) shall be performed to determine the need for rescue and fire fighting equipment and services at surface level vertiports and elevated vertiports located above unoccupied structures.

10.2.3 Fire fighting equipment should be adjacent to, but outside, the TLOF and FATO area. Fire safety equipment should be clearly marked for conspicuousness from anywhere within or outside the FATO.

10.2.4 For elevated sites, fire equipment may be located below the level of the FATO but must be fully accessible under all circumstances and clearly marked.

10.2.5 At surface level vertiports, the operational objective of the rescue and fire fighting response shall be to achieve response times not exceeding two minutes in optimum conditions of visibility and surface conditions.

10.2.6 A suitable alerting and/or communication system shall be provided in accordance with the emergency response plan.

10.2.7 Rescue and fire fighting personnel shall be trained to perform their duties especially for handling electrical fire/ dangers associated with electric propulsion, and maintain their competence.

10.2.8 Rescue and fire fighting personnel shall be provided with protective equipment.

10.2.9 Elevated vertiports and vertiports shall be provided with a main access and at least one additional means of escape.

10.2.10 Access points shall be located as far apart from each other as is practicable.

10.3 Security and Safety

10.3.1 Controlling vertiport access and keeping operational areas clear of people, animals, equipment, debris, and vehicles is important for safety and security.

10.3.2 The Security measures shall be as per MHA and BCAS regulations.

10.3.3 The following guidance apply to safety barriers and access control measures:

10.3.3.1 The Operator should develop Safety Management System as per DGCA CAR Section 1 Series C Part 1.

10.3.3.2 Appropriate Bird Hazard Control, Apron Management and Disabled Aircraft Removal Plan (DARP) should be developed.

10.3.3.3 For surface level vertiports, erect a safety barrier around the operational areas in the form of a fence or a wall outside of the Safety Area and below the elevation of the approach/departure surface.

10.3.3.4 If necessary, near the approach/departure paths, install the barrier well outside the outer perimeter of the Safety Area and below the elevation of the approach/departure and transitional surfaces.

10.3.3.5 Safety barriers must be high enough to present a positive deterrent to persons inadvertently or maliciously entering an operational area, but at a low enough elevation to be non-hazardous to all aircraft operations.

10.3.3.6 Display a vertiport caution sign like that shown in Figure 18 at all vertiport access points.

Figure 18: Vertiport caution sign

11. Site Clearance and Authorization

11.1 Procedure for site clearance

11.1.1 The applicant must be eligible as per Para 2.1,

11.1.2 The applicant intending to become a Vertiport operator shall obtain the clearances/ permissions from the following authorities before making application to DGCA:

(a) MHA through MoCA,
(b) Airports Authority of India –ATM point of view, as applicable,
(c) Owner of the land,
(d) Local authority such as Municipal Corporation or urban land development board/ authority of the State or its Country and Town Planning Department.

11.1.3 Application for Site Clearance for Vertiport from DGCA:

(a) Applicant for construction of Vertiport shall make an application to the DGCA in **FORM CA (V)-1** along with supporting documents for approval of the Vertiport site.
(b) The site may be inspected for its suitability by the DGCA. The applicant may be required to facilitate the inspecting officer(s) for such inspections.

11.2 Construction of Vertiport

11.2.1 After 'In principle' approval is given by the DGCA for the intended vertiport site, the applicant shall submit a project report / execution plan to the DGCA for acceptance.
11.2.2 The grant of approval/acceptance by the DGCA does not absolve the applicant from observing the statutory guidelines of other official bodies.

11.2.3 The project report shall include the Vertiport facilities, Services and equipment to be made available at the vertiport.
11.2.4 As a minimum, for public use vertiport, the plan shall include an independent FATO, taxi and apron to provide at least two independent VCA parking positions, designed for most demanding VCA the vertiport is intended to serve and terminal building for passenger facilitation.
11.2.5 The Apron should be connected to the FATO by at least one taxiway designed for surface movement of VCAs and with enough protection area to ensure safe air-taxi by the VCAs.
11.2.6 The plan may also include provision of associated infrastructure for passenger facilitation and maintenance of VCAs including hanger.
11.2.7 An ATC tower may be constructed by the Vertiport operator to provide ATS if required.
11.2.8 Architectural and infrastructure related guidelines for the optimal implementation of security guidelines shall be integrated in the design of the Vertiport as per the relevant BCAS regulations.
11.2.9 After construction of vertiport as per the guidelines / requirements. The applicant shall submit the project completion report to DGCA along with the application for grant of Vertiport Authorization.

11.3 Grant of Vertiport Authorization

11.3.1 The application for grant of Vertiport Authorization shall be made in the prescribed form CA (V)-2 to the DGCA.
11.3.2 The application for Vertiport Authorization shall be accompanied with the following documents:

(a) Project completion report,

(b) Proof of compliance,

(c) Vertiport Operation Manual,

(d) SMS Manual,

(e) Bird Hazard Control Plan,

(f) Disabled Aircraft Removal Plan,

(g) Other supporting documents as specified in the Form CA (V)-2.

11.3.3 The Vertiport operation manual (Guidance to prepare and maintain the manual is given in Attachment-1) shall contain all information, procedures and instructions that are necessary to enable the operating staff, to perform their duties in such a manner that will ensure the Vertiport to be safe for operations.

11.3.4 The Vertiport operator shall employ personnel commensurate to the level of operations competent to perform their duties to perform all critical activities for Vertiport operations and maintenance.

11.3.5 An identifiable person, in-charge for the operations and maintenance of the Vertiport shall be designated as 'ACCOUNTABLE MANAGER'. In addition, a list of qualified, experienced and trained personnel required for operations and maintenance of Vertiport shall also be provided.

11.3.6 The applicant shall submit proof of compliance in respect of the guideline contained in this ADAC. The compliance shall indicate compliance of guidelines and deviation as well.

11.3.7 Prior to the issue of Vertiport Authorization, the applicant shall obtain clearance as well as demonstrate the functional arrangements for Navigation/ Surveillance/ Communication, RFF, Security (BCAS) and meteorological services as applicable.

11.3.8 The vertiport operator shall submit the coordination procedure with adjacent ATC units for operation of VCA/SCA.

11.3.9 A Pre-Authorization inspection will be carried out by DGCA. The applicant may be required to facilitate the inspecting officer(s) for such inspections.

11.3.10 The Vertiport Authorization may be granted on compliance of all relevant requirements in the AC. In case of the non-compliance of the ADAC by the applicant, Authorization may either be refused or granted with limitations/ restrictions / conditions as deemed appropriate if it is considered that the overall safety is not compromised.

11.3.11 Vertiport Authorization shall be valid for a period of 05 years unless it is surrendered by the holder or is suspended or cancelled by the Director General. The Authorization shall remain valid subject to adherence of all applicable rules or regulations and conditions/limitations, if any, attached to the Authorization.

11.3.12 The grant of Vertiport Authorization obliges the Vertiport operator to:

(a) ensure the safety, regularity, and efficiency of operations at the Vertiport,

(b) be responsible for notifying and reporting occurrences, as applicable;

11.3.13 The vertiport operator shall implement procedures annexed in the vertiport operation manual for all users of the vertiport, including fixed-base operators, ground-handling and other organizations that perform activities independently at the vertiport in relation to vertiport maintenance, flight or aircraft handling, to comply with the requirements laid down by the vertiport operator with regard to safety at the vertiport and speedy communication of any accidents, incidents, defects and faults which may have a bearing on safety in general. The vertiport operator shall monitor such compliance and document the same.

11.3.14 DGCA may carry out periodic inspections of Vertiports to ensure continued compliance during the validity period.

11.4 Amendment to Vertiport Authorization

11.4.1 A Vertiport Authorization may be amended in response to a request by the Vertiport Operator or as a consequence of enforcement action by DGCA.

11.4.2 An application for amendment to the Vertiport Authorization should be submitted along with original Vertiport Authorization.

11.4.3 An application for amendment to the Vertiport Authorization should be supported by relevant documents including detailed account of the proposed amendment.

11.5 Renewal of Vertiport Authorization

11.5.1 The applicant shall submit the application for the renewal of Authorization along with the applicable changes in manual, infrastructure, personnel etc. (if any), at least 45 days before the date of expiry of Vertiport Authorization.

11.5.2 In case of any alteration to the vertiport infrastructure has been carried out during the currency of the Vertiport Authorization, the same may be submitted along with updated Vertiport manual at the time of renewal.

11.6 Change of Vertiport Authorization Holder

11.6.1 Vertiport Authorization is non-transferable.

11.6.2 In case the Authorization holder is to change, a fresh application for issue of new Authorization is to be made to DGCA by the prospective applicant substantiated by appropriate supporting documents from the existing approval holder.

11.6.3 The prospective applicant must be eligible as per para 2.1 and shall also fulfil all guidelines as required for a fresh issue of Authorization as specified in Para 11.3.

11.6.4 Minimum notification of three months is required for change in the Authorization holder. During the change the outgoing operator shall be responsible for the operation of the vertiport until the grant of fresh Vertiport Authorization to the new applicant.

11.7 Discontinuation / Surrender of Authorization

11.7.1 The Authorization holder shall give a written notice to DGCA not less than 60 days from the date on which the authorization is to be discontinued / surrendered, in order that suitable promulgation action can be taken.

11.7.2 The original Vertiport Authorization should be surrendered along with the written notice.

11.7.3 On approval of the surrender of the Authorization the Vertiport operator shall ensure that appropriate measures have been taken to avoid unintended use of the Vertiport /landing area by VCA/SCA unless DGCA has approved the use of the Vertiport for other purposes.

11.8 Violations & Enforcement

In case vertiport operator is found not adhering to the Provisions of the Aircraft Act, 1934, the Aircraft Rules, 1937, this ADAC, the vertiport operation manual accepted by DGCA, or meeting the terms and conditions specified in the Authorization; the Authorization granted to the organization shall be subject to appropriate enforcement action.

Dutt
05/9/24

(Vikram Dev Dutt)
Director General of Civil Aviation

ATTACHMENT-1

GUIDELINES FOR PREPARATION & MAINTENANCE OF VERTIPORT OPERATIONS MANUAL

A. PREPARATION OF VERTIPORT OPERATIONS MANUAL:

a. Every owner or operator responsible for operation of a Vertiport shall prepare a Vertiport Operations Manual in respect of such Vertiport and submit a physical and a soft copy each of the Vertiport along with the application for issue of Vertiport Authorization. Subsequently Vertiport Operations Manual shall be submitted at the time of renewal of Vertiport approval clearly highlighting all the amendments that have been accepted by DGCA and incorporated in Vertiport Operations Manual. A Vertiport Operations Manual shall:

i. Be signed by the vertiport Director/ person in-charge for day-to-day operation of Vertiport Operations Manual.

ii. Be in a form that is easy to revise

iii. Have the statement of acceptance by DGCA.

b. PARTICULARS TO BE INCLUDED IN A VERTIPORT OPERATIONS MANUAL:

The Vertiport Operations Manual shall include at least the following elements:

1. INTRODUCTION

1.1 Front Title page containing Vertiport Operations Manual name and month & year of Issue/current version no.

1.2 Preface shall include the objective, policy and commitment of Vertiport operator and shall be signed by the Vertiport Director/person in charge for day-today operation of Vertiport.

1.3 Record of Amendments

1.4 Table of Contents.

1.5 Master contact list includes at least all people involved with operational aspects of the Vertiport such as CEO/COO/ Vertiport Director /person in charge, DGCA.

1.6 Distribution List of the Manual.

1.7 Procedures for amendment to the Manual.

1.8 List of Supporting Operational Documents.

1.9 Glossary of Terms relevant to the Vertiport.

1.10 Vertiport Approval Copy.

1.11 Vertiport Operations Manual Acceptance Letter.

2. PART 1 – GENERAL

2.1 Purpose and scope of the manual.

2.2 Conditions for use of the Vertiport Operations Manual - a statement to indicate that the category under which the Vertiport Operations Manual shall be used i.e. public use or private use as defined in the ADAC.

2.3 The system of submission of Vertiport data to DGCA for promulgation.

2.4 The system for recording aircraft movement; and

2.5 Obligations of the Vertiport Operator.

3. PART 2 - PARTICULARS OF THE VERTIPORT SITE

3.1 General Description of Vertiport

3.2 Plan of the Vertiport showing the main facilities for the operation of the Vertiport and

Location of each wind direction indicator;

3.3 Plan of the Vertiport showing the boundaries;

3.4 Plan showing the distance of the Vertiport from the nearest city, town or other populous

Area, and the location of any Vertiport facilities and equipment outside the boundaries of the Vertiport; and

3.5 Particulars of the title of the Vertiport site or if the boundaries of the Vertiport are not defined in the title documents, particulars of title to or interest in the property on which the Vertiport is located and a plan showing the boundaries and position of the Vertiport.

4. PART 3 - PARTICULARS OF THE VERTIPORT REQUIRED TO BE REPORTED TO DGCA FOR PROMULGATION

4.1 GENERAL INFORMATION

4.1.1 The name of the Vertiport;

4.1.2 The location of the Vertiport;

4.1.3 The geographical co-ordinates of the Vertiport Reference Point determined in terms of World Geodetic System - 1984 (WGS - 84) reference datum;

4.1.4 Vertiport elevation;

4.1.5 The elevation of each FATO and any significant high & low points along the elongated FATO.

4.1.6 Vertiport reference temperature;

4.1.7 Details of the Vertiport beacon.

4.1.8 Provision of Communication and MET services.

4.1.9 Name, Address and telephone of the Vertiport operator

4.2 VERTIPORT DIMENSIONS AND RELATED INFORMATION

4.2.1 TLOF, FATO, SA dimension, slope, surface type.

4.2.2 Length, width and surface type of taxiways;

4.2.3 Apron surface type and stands;

4.2.4 Clearway length and ground profile;

4.2.5 Visual aids (if any);

4.2.6 Marking of TLOF, FATO, SA, taxiways, and aprons;

4.2.7 Other visual guidance and control aids on taxiways

4.2.8 Availability of standby power Supply;

4.2.9 The geographical coordinates of each TLOF;

4.2.10 The geographical coordinates of each stand;

4.2.11 the geographical coordinates and the top elevation of significant obstacles in the approach and Climb out areas (This information may best be shown in the form of charts)

4.2.12 Declared distances as mentioned in Para 6.1 of the ADAC

4.2.13 Disabled aircraft removal plan: the telephone numbers; email address of the Vertiport coordinator for the removal of an aircraft.

4.2.14 Rescue and fire fighting: level of protection provided.

5. PART 4 - PARTICULARS OF THE VERTIPORT OPERATING PROCEDURES AND SAFETY MEASURES

5.1 VERTIPORT REPORTING

Particulars of the Procedures for reporting any changes in the Vertiport information including the following;

5.1.1 Arrangements for reporting any changes such as degradation of facilities etc. to the DGCA, and recording the reporting of changes, during and outside the normal hours of Vertiport operations;

5.2 ACCESS TO VERTIPORT OERATIONAL AREA

Particulars of the procedure developed and to be followed for prevention of unauthorized entry of persons, vehicles, equipment, animals or other things, into the movement area including the following:

5.2.1 The role of Vertiport operator, aircraft operator, Vertiport fixed-base operators, Vertiport Security entity, the DGCA & other government departments, as applicable; and

5.2.2 The names and role of the personnel responsible for controlling access (for vehicles, Equipment's etc.) to the Vertiport.

5.3 VERTIPORT EMERGENCY PLAN

Particulars of the Vertiport emergency plan, including the following:

5.3.1 Plans for dealing with emergencies occurring at the Vertiport or in its vicinity, including malfunction of VCA/ SCA in flight, structural fires, sabotage, unlawful seizure of aircraft and incidents on the vertiport covering "during the emergency" and "after the emergency".

5.3.2 Details of Vertiport facilities and equipment to be used in emergencies, including the frequency of test of the emergency plan & equipment's and facilities.

5.3.3 Appointment of an on-scene commander of an overall emergency operation.

5.3.4 Emergency plans must include human factors principles.

5.4 RESCUE AND FIRE FIGHTING

5.4.1 Particulars of the facilities, equipment's, personnel and procedures for meeting the rescue and fire fighting requirements.

5.4.2 The names and roles of the persons responsible for dealing with the rescue and fire fighting services at the Vertiport.

5.4.3 Description of RFFS training and competency process

5.4.4 Description of equipment's maintenance programme.

5.5 INSPECTION OF VERTIPORT MOVEMENT AREA

Particulars of the procedures for the inspection of the Vertiport movement area and obstacle limitation surfaces, including the following:

5.5.1 Arrangement for carrying out inspections of facilities.

5.5.2 Arrangement for keeping an inspection logbook and the location of the logbook.

5.5.3 Details of inspection intervals and times.

5.5.4 Inspection checklist

5.5.5 Arrangement for reporting the results of the inspection and for taking prompt follow-up actions to ensure correction of unsafe conditions; and

5.5.6 The names and roles of persons responsible for carrying out inspections.

5.6 VISUAL AIDS AND VERTIPORT ELECTRICAL SYSTEM

5.6.1 Particulars of the WDI, Vertiport Beacon, and Charging/ Energizing facilities provided at the Vertiport and their lay out plan.

5.6.2 Procedures for the inspection and maintenance of the signs, markings and Vertiport electrical system etc. shall be prepared separately for each type of facility.

5.6.3 Arrangement for carrying out routine maintenance and emergency maintenances of facilities.

5.6.4 Arrangement for secondary power supplies, if any, and if applicable, particulars of any other method of dealing with partial or total system failure.

5.6.5 The names and roles of the persons responsible for inspection and maintenance electrical system.

5.7 OPERATIONAL AREA MAINTENANCE

The Vertiport operator should develop a Vertiport maintenance programme with complete assessment of all parts of the vertiport, all machinery, technical and mechanical inventory, including vehicles. Each task should be assigned to team or expert responsible for one special task have specific systematic work programme. The programme should include human factor principles related to maintenance activities and programme should be reviewed at least once in a year.

5.7.1 Particulars of the facilities and procedures for the maintenance of movement area, including:

5.7.2 Procedures for carrying out periodic/ daily inspections of operational area to control the FOD and a system to assess surface irregularities should be included in the Manual.

5.7.3 Arrangement for maintaining the paved areas.

5.7.4 Arrangement for maintaining the Vertiport drainage system (if available).

5.8 APRON MANAGEMENT

Particulars of the apron management procedures:

5.8.1 Arrangement for allocating parking positions and monitoring clearance distance during aircraft parking.

5.8.2 Marshalling service.

5.8.3 Description on procedures for enforcement of safety precautions during charging of batteries.

5.8.4 Description on procedures for reporting accident/incidents.

5.8.5 Procedures for auditing safety compliances by all personals working on apron.

5.9 WILDLIFE HAZARD MANAGEMENT

Particulars of the procedure to deal with danger to operations caused by the presence of birds or mammals in the Vertiport flight pattern or movement area, including the following;

5.9.1 Arrangement for assessing any wildlife hazard;

5.9.2 Arrangement for implementing wildlife control programmes; and

5.9.3 Arrangement with local civil authorities for resolving conflicting issues between land – use and aircraft safety.

5.9.4 Names and roles of the persons responsible for dealing with wildlife hazards.

5.10 OBSTACLE CONTROL

5.10.1 Monitoring the obstacle limitation surface

5.10.2 Controlling obstacles within the authority of the operator;

5.10.3 Monitoring buildings or structure development in relation to their height within the boundaries of the obstacle limitation surface.

5.10.4 The control of new developments in the vicinity of Vertiport

5.10.5 Notifying the DGCA of the nature and location of obstacles

5.11 DISABLED AIRCRAFT REMOVAL PLAN AND PROCEDURE

Particulars of procedure for removing a VCA/ SCA which disabled on or adjacent to the movement area including the following:

5.11.1 Roles of the Vertiport operator and the VCA/ SCA operator.

5.11.2 Arrangement for notifying the VCA/ SCA operator.

5.11.3 Arrangement for liaising with the air traffic control;

5.11.4 Arrangements for notification to DGCA, AAIB and the protection of evidence, custody and the removal of VCA/ SCA in accordance with Aircraft (Investigation of Accidents and Incidents) Rules, 2017.

5.11.5 Names and roles of persons responsible for arrangement of the removal of disabled aircraft and their telephone numbers.

5.12 SAFETY MANAGEMENT SYSTEM (SMS)

A safety management system shall be established as per CAR Section 1 Series C Part I for ensuring the compliance with all safety requirements and achieving continuous improvement in safety performance, the essential features being:

5.12.1 Safety policy, in so far as applicable, on the process of safety management and its relation to the operational and maintenance process.

5.12.2 Structure or organization of the SMS including staffing and assignment of individual and group responsibilities safety issues.

5.12.3 SMS strategy and planning such as setting safety performance targets, allocating priority for implementing safety initiatives and providing a framework for controlling the risks to a level as low as reasonably practicable keeping always in view the ADAC, National regulations, standards, rules or orders.

5.12.4 SMS implementation including facilities, methods and procedures for the effective communication of safety messages and enforcement of safety requirements.

5.12.5 System for the implementation of, and action on, critical safety areas which require a higher level of, safety management integrity (Safety Measures Programme).

5.12.6 Measures for safety promotion, accident prevention and system for risk control involving analysis and handling of accident, incidents, complaints, defects, faults, discrepancies and failures, and continuing safety monitoring.

5.12.7 System for the documentation of all safety related vertiport facilities as well as operational and maintenance records.

5.12.8 Staff training and competency including review and evaluation of the adequacy of training provided to staff on safety related duties and of the certification system for testing their competency.

5.12.9 Incorporation of safety related clauses in the contracts for work at the Vertiport and enforcement, thereof.

Note. - SMS manual may be prepared separately and bound in a separate folder. However reference for same may be made available wherever needed.

5.13 MAINTENANCE OF VERTIPORT OPERATIONS MANUAL:

The Vertiport owner/operator shall:

5.13.1 Keep the Vertiport Operations Manual current at all times.

5.13.2 Maintain at least one complete and updated current copy of its approved Vertiport manual at the Vertiport.

5.13.3 Provide copy of the approved Vertiport Operations Manual to all the concerned.

5.13.4 The numbering of the pages and paragraphs should be systematic and in order to facilitate reference.

5.13.5 The Vertiport Operations Manual information will enable the DGCA in assessing the suitability of the Vertiport Operations Manual for permitting a particular level of aircraft operation there at. This information shall also be the basic reference for safety inspections. During the inspection by the officer of DGCA a copy of the Vertiport Operations Manual shall be made available to the Inspecting Officer(s).

5.14 NOTIFICATION OF AMENDMENT AND CHANGES TO THE VERTIPORT OPERATIONS MANUAL:

The owner /operator of the approved Vertiport shall:

5.14.1 Alter or amend the Vertiport Operations Manual, whenever necessary, in order to maintain the accuracy of the information in the manual.

5.14.2 Review and submit amended manual at the time of renewal of Vertiport Operations Manual.

5.14.3 Make changes or addition by additional or replacement pages on which the amended material is clearly identified.

5.14.4 Submit the proposed amendments in the Vertiport Operations Manual to DGCA for its acceptance at least 30 days prior to the effective date.

5.14.5 After acceptation from DGCA, distribute the final copies of Vertiport Operations Manual as per the distribution list and also submit a copy of the same to DGCA.

APPLICATION FOR VERTIPORT SITE CLEARANCE

(To be filled in Capital Letters Only)

1. DETAILS OF APPLICANT (Authorized Signatory)	
1.1 Full name of applicant:	
1.2 Address of applicant:	
1.3 Email & Phone Number:	
1.4 Nationality of the Applicant:	
2. DETAILS OF ORGANIZATION:	
2.1 Legal Name of the Organization:	
2.2 Certificate of Incorporation details:	
2.3 Registered Address of the Organization:	
2.4 Name of the Directors and their nationality:	
3. DETAILS OF PROPOSED VERTIPORT SITE:	
3.1 Proposed Category of Vertiport	☐ PUBLIC USE or ☐ PRIVATE USE
3.2 Proposed Type of Vertiport	☐ SURFACE LEVEL ☐ ELEVATED
3.3 Place name by which the Vertiport is to be known in all future references:	
3.4 Name, Address and Contact details of the owner of Vertiport:	
3.5 Location of the Vertiport site with reference to the nearest airport, railway station and town/village:	
3.6 State / District in which situated:	
3.7 Latitude / longitude of the Vertiport Reference Point:	
3.8 Elevation of the Vertiport Reference Point (AMSL):	

3.9 Enclose layout plan of the Vertiport site, including boundary, buildings and facilities proposed to be provided, preferable scale 1:2500 or 1:5000			
3.10 Enclose a topographical map in the scale of 1:25,000 or 1:50,000 of the proposed area showing distances and heights of all objects likely to interfere with the safe use of the Vertiport within a radius of 3.5 Kms of the proposed site.			
4. CONTROL OF THE VERTIPORT			
Are you the owner of the Vertiport Land?		☐YES	☐ NO
IF YES - Attach copy of ownership documents			
IF NO – Please State			
4.1 Details of the rights you hold over the land (Attach copy of relevant documents):			
4.2 The period for which you hold these rights, including terminating date:			
FROM	DDMMYYYY	TO	DDMMYYYY
5. PERMISSIONS AND APPROVALS OBTAINED Indicate YES/NO and mention the details of supporting document against each authority			
5.1 MHA through MoCA			
5.2 Airports Authority of India- ATM point of view, as applicable			
5.3 Owner of the land			
5.4 Local authority such as Municipal Corporation or urban land development board/authority of the State or Town Planning Department, Fire Department.			

DECLARATION:

I hereby declare that all information provided herein are true and correct to the best of my knowledge. I understand that furnishing any false information or document(s) herein shall make me liable for penal action, as applicable.

SIGNATURE OF APPLICANT
NAME (In capital letters)
POSITION HELD (With official seal)

Date:

APPLICATION FOR VERTIPORT AUTHORIZATION

(To be filled in Capital Letters Only)

1. DETAILS OF APPLICANT (Authorized Signatory)	
1.1 Full name of applicant:	
1.2 Address of applicant:	
1.3 Email & Phone Number:	
1.4 Nationality of the Applicant:	
2. DETAILS OF ORGANIZATION (as required to be shown on the Authorization Certificate)	
2.1 Legal Name of the Organization:	
2.2 Registered Address of the Organization	
2.3 Name of the Directors and their nationality	
2.4 Site Clearance Details	
3. DETAILS OF CONSTRUCTED VERTIPORT	
3.1 Proposed Category of Vertiport	☐ PUBLIC USE or ☐ PRIVATE USE
3.2 In case of private aerodrome, indicate the purpose for which the aerodrome will be used	
3.3 Proposed Type of Vertiport	☐ SURFACE LEVEL ☐ ELEVATED
3.4 Latitude / longitude of the Vertiport Reference Point:	
3.5 Elevation of the Vertiport Reference Point (AMSL):	
3.6 Situation of the Vertiport site with reference to the nearest airport, railway station and town/village	
3.7 State / District in which situated	

3.8 provide details of proposed MET facilities	
3.9 Type and maximum total weight of the largest / heaviest VCA/ SCA for which the aerodrome is designed, including overall length and maximum fuselage width.	
3.9.1 TYPE	
3.9.2 WEIGHT	
3.9.3 LENGTH	
3.9.4 WIDTH	
3.9.5 D- Value of Design VCA/ SCA	
4. Control of the Vertiport	
4.1 Are you the owner of the aerodrome site	
☐ YES ☐ NO	
IF NO – Please state:	
4.2 Details of the rights you hold over the land	
4.3 The period for which you hold these rights, including terminating date	
4.3.1 FROM	DDMMYYYY
4.3.1 TO	DDMMYYYY
4.3.1 TERMINATION	DDMMYYYY
5. PERMISSIONS AND APPROVALS	
Name of the Authority	**Dates and Reference of Permission/Approval**
5.1 (a) MHA through MoCA	

5.2 Airports Authority of India –ATM point of view, as applicable	
5.3 Owner of the land	
5.4 Local authority such as Municipal Corporation or urban land development board/ authority of the State or Town Planning Department/ Local Fire department	
6. AERODROME MANGEMENT PERSONNEL	
6.1 Board Member/ Managing Director or person having specific responsibility for safety (Accountable Manager)	
6.1.1 Name	
6.1.2 Designation	
6.1.2 Telephone/ E-mail id	
6.2 The person in charge of day-to-day operation of Vertiport (Please enclose a current Curriculum Vitae [CV])	
6.2.1 Name	
6.2.2 Designation	
6.2.3 Telephone/ E-mail id	
6.3 The person responsible for Vertiport Safety (Safety Manager). If different from 6.2 (Please enclose a current Curriculum Vitae	
6.3.1 Name	
6.3.2 Designation	
6.3.3 Telephone/ E-mail id	
6.4 Provision of the Communication Services (as applicable)	
6.4.1 Name	
6.4.2 Address	

6.5 Provision of the MET services	
6.5.1 Name	
6.5.2 Address	
6.5 The person responsible for overseeing the day-to-day provisions of RFF	
6.5.1 Name	
6.5.2 Designation	
6.5.3 Telephone/ E-mail id	
7. Enclosure (Attach following documents for examination)	
Name of the Document	**Attached (as applicable)**
Project Completion Report	
Proof Of Compliance	
Vertiport Operation Manual	
SMS Manual	
Bird Hazard Control Plan	
Disabled VCA/ SCA Removal Plan	
Any Other Information	

Declaration:

I hereby declare that all information provided herein are true and correct to the best of my knowledge. I understand that furnishing any false information or document(s) herein shall make me liable for penal action, as applicable.

SIGNATURE OF APPLICANT
NAME (In capital letters)
POSITION HELD (With official seal)

Date: