

Drone flight operating manual in Skellefteå Droneport Test Area



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0.Version management

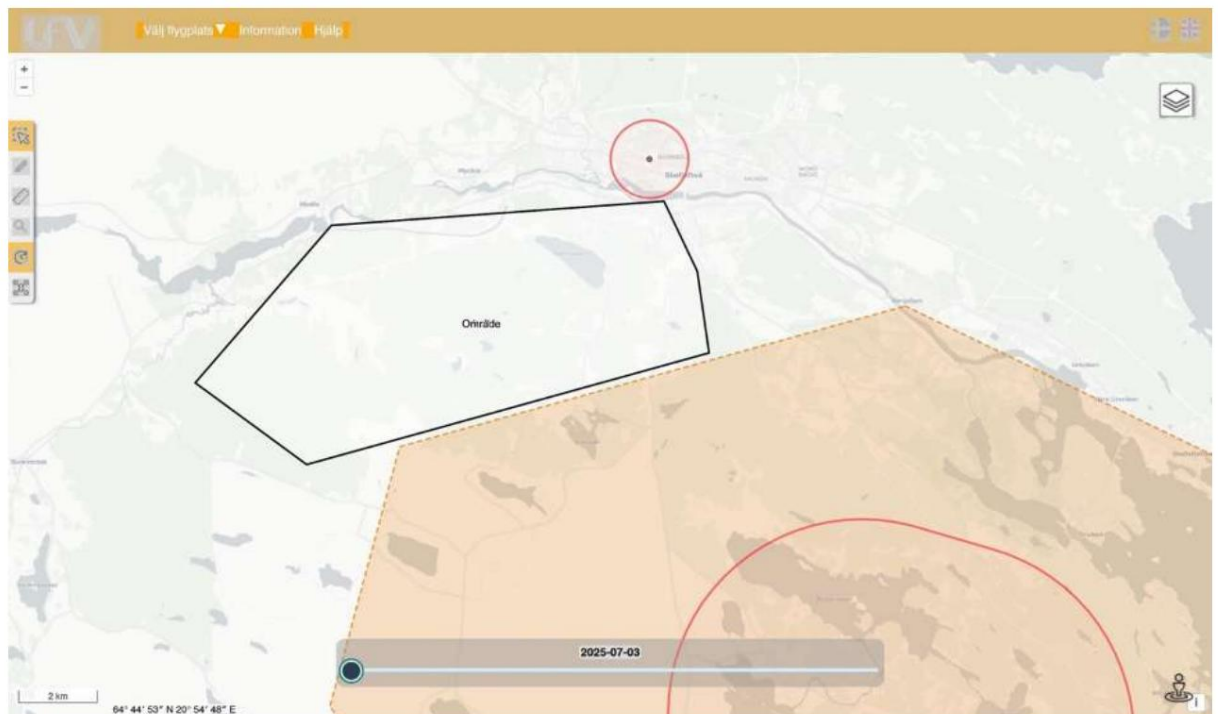
The owner of this manual is Robert Lindberg, CEO of Skellefteå Airport.

Henrik Littorin has a delegated responsibility to ensure that the manual is accurate and known.

Version	Date	Author	Description of change	Approved by
1.0	2025-03-17	Jan-Olof EHK	Established by CEO Robert Lindberg	Henrik Littorin
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3.0	2025-08-31	Jan-Olof EHK	Established by CEO Robert Lindberg	Henrik Littorin
4.0	2025-11-07	Henrik Littorin	Established by CEO Robert Lindberg	Henrik Littorin

1. Description Skellefteå Droneport Test Area and business

Outer zone



Coordinates for the above:

644445N 0205655E - 644347N 0205800E
644239N 0205823E - 644106N 0204519E
644214N 0204142E - 644425N 0204607E -
644445N 0205655E

The area is located entirely within G airspace.

Flying in the test area may only be done by drone operators who have signed an agreement with Skellefteå Airport regarding the Skellefteå Droneport Test Area.

Arctic Aviation Hub aims to accelerate the future of sustainable aviation by driving innovation and collaboration with a focus on battery and hydrogen electric aircraft, drones and supporting infrastructure. Arctic Aviation Hub can provide infrastructure at the airport, at the drone gate and on the downtown Campus.

The Arctic Aviation Hub was launched as the ELIS program in 2021. It is a regional ambition to become an early adopter of electric aircraft and drones and to be a leading hub in research and development of electrified aviation.

Arctic Aviation Hub initiates and facilitates a project portfolio with a number of public, private and academic partners. The main focus is on infrastructure, expertise and the network that can be offered in Skellefteå as well as the opportunities to conduct winter tests and stress test airborne vehicles and ground infrastructure in cold and harsh weather conditions.

Arctic Aviation Hub is coordinated by Skellefteå Science City and has core funding from Skellefteå Airport, Skellefteå Municipality and Skellefteå Kraft.

Within the framework of the Arctic Aviation Hub, Skellefteå Municipality, together with Skanska and Skellefteå Airport, has built Skellefteå Droneport, which is one of Europe's largest urban drone airports. It is dedicated to testing, development, training and commercialization of drones and supporting technologies in a real environment. The long-term goal is to be able to bring together Skellefteå's socially beneficial drone services at the drone airport. Skellefteå Airport has operational responsibility for Skellefteå Droneport.

Basic facts about Skellefteå Droneport

15x15 meter take-off and landing area

15x15x7 meter heated hangar space

Office, conference and kitchen space with panoramic windows facing the hangar

Total fenced area 60x40 meters

Visitor balcony and maneuvering deck facing the take-off and landing area

Tests in harsh, cold and dark weather conditions

5G coverage

DJI Dock 2

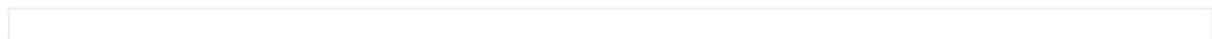
Parking space and charging station for electric vehicles

Outside CTR, allowing VLOS flight altitudes up to 120 meters

Integration into real-world applications in the city and countryside

Access to a broad national and international network for joint projects

Member of the EU UAS Test Center Alliance and the Swedish Drone Network

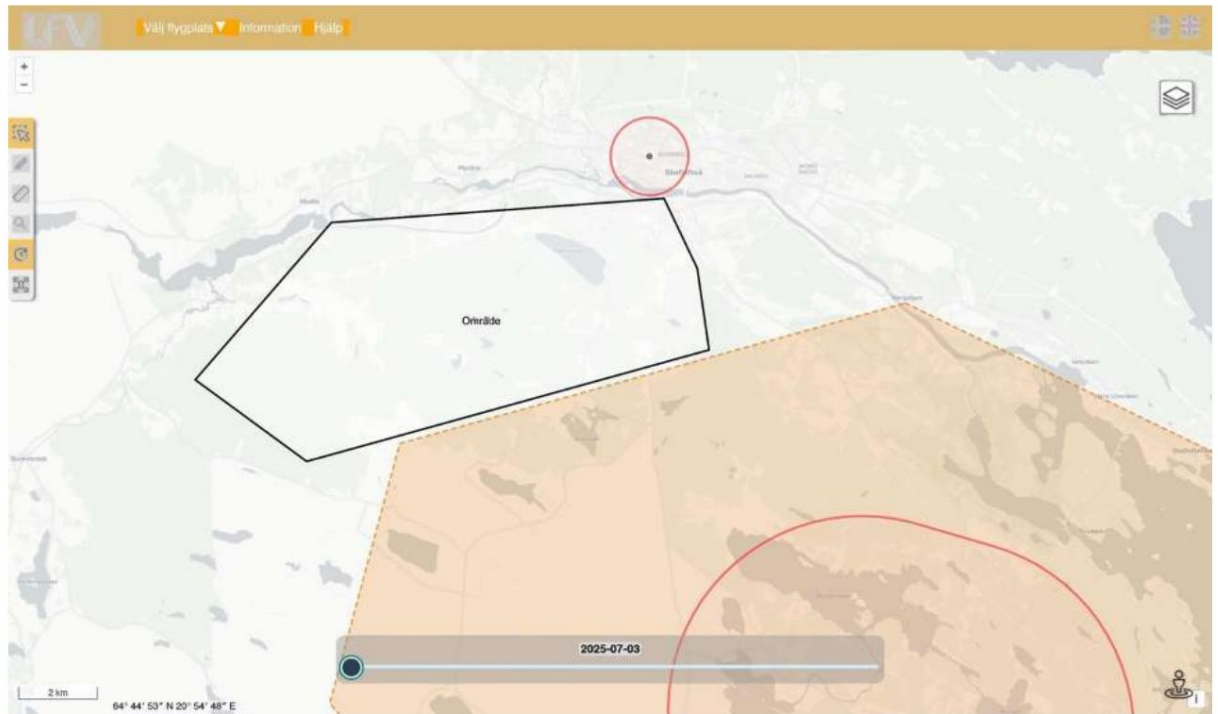


2. Drone flight

2.1 Starting location

Take-off and landing may normally take place from a designated drone launch site where a drone port is available.

Area for flights:



Coordinates for the above:

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644445N 0205655E

Starting zone:

644345N 205729E
644333N 205728E
644333N 205627E
644345N 205627E

2.2 Basic responsibilities in the test area

Drones must be continuously monitored during flight by a responsible operator and a qualified drone pilot. The air traffic controller must be informed well in advance of the planned flight by telephone.

0910-57690 and then on the same number approximately 30 minutes before the start of the flight. The operator must follow this manual. A person responsible for the test area must be appointed before each test.

2.3 Drops

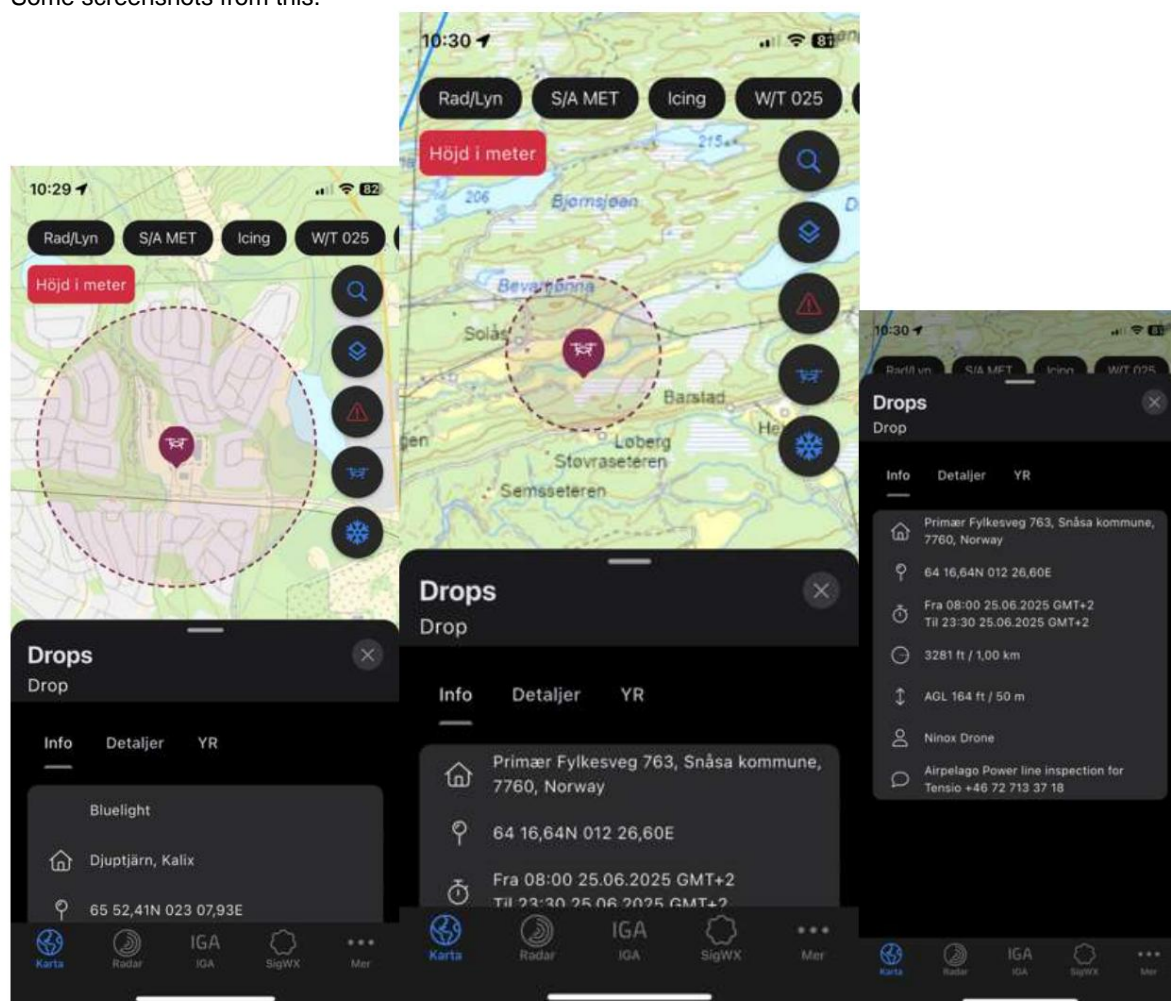
When flying BVLOS within the relevant area, the operator must enter the flight in the Drops app. and thus become visible to other aviation, including the ambulance helicopter. When flying within visual line of sight, operators will be encouraged to enter the flights in the Dronerequest app, but it will not be a requirement for VLOS flights departing from Skellefteå Droneport.

DROPS

Here is a description of how to report flights to DROPS Hems wx. <https://norskluftambulans.no/drone/>

This means that the ambulance helicopter has access to this during flight via HemsWx.

Some screenshots from this.



2.3.1 Stakeholders

Drone operators: Commercial, private and public actors who are in need of D-area/geographic UAS zone for testing, research and development of drones and drone-related services in a real-world environment and a subarctic climate.

2.3.2 Operational context for the D-area/UAS geographic zone

Weather Conditions: The area is subject to varying weather conditions including snow, severe cold, fog and wind, which can affect drone flight patterns and visibility.

According to the Swedish Transport Agency's decision TSL 2024-7874, the following weather minimums apply for operations to be carried out in the area: cloud base at least 500 ft and clear visibility at least 3 km.

2.3.3 Operational needs and requirements

Emergency response available in the event of incidents or accidents during drone operations in the area, including reporting processes.

2.3.4 Operational conditions

Pre-flight approval process

1. Plan submission: The operator submits their planned flight plans
2. Verification: The D-area manager evaluates the submission against active airspace conditions and regulatory restrictions.
3. Adjustments: If necessary, operators are asked to adjust their plans to avoid conflicts or comply with temporary flight restrictions
4. Approval: Issued when compliance has been confirmed.

Real-time flight monitoring

According to the Swedish Transport Agency's decision TSL 2024-7874, the following applies:

Terms

The Armed Forces and the Police Authority have priority in the area. If the need arises to temporarily establish a restricted area that overlaps the temporary dangerous area, the dangerous area may not be used. AMC Sweden is responsible for deactivation and contact with Skellefteå Airport.

Skellefteå Airport shall make available an operational schedule to be provided to operational stakeholders and the public. Skellefteå Airport is responsible for providing a link to a website where information about the operations, including the operating schedule, is always available. The link shall be published for civil and military aviation. The operating schedule is presented at:

<https://skellefteaairport.se/om-flygplatsen/#flyga-dr%C3%B6nare>

The operating schedule shall include the dates, times and type of planned activities in the hazardous area. The operating schedule shall be established at least one week in advance. The operating schedule shall be kept updated to provide up-to-date information on planned activities.

Skellefteå Airport will make available a telephone number that airspace users can reach to inform themselves about ongoing operations.

Skellefteå Airport shall ensure that the following features and capabilities are available, function reliably, and are used by operators flying BVLOS in the area:

- a. that UAS operators use ADS-B IN receivers.
- b. that UAS operators ensure that altitude data and altitude references are correctly set before commencing flight.
- c. that UAS operators use geocage technology in their UAS to ensure that all flights take place within the boundaries of the danger area with associated vertical and lateral buffers.
- d. that UAS operators continuously monitor their flights in their own systems and that in the event that other aircraft are in the area, they shall give way to them in accordance with the applicable regulations for the operation of UAS. This means that in the case of manned aviation, the drone operator shall ensure that the drone lands as soon as possible.

Post-flight analysis

Comprehensive logging of all drone operations within the system for accountability and future reference.

Analytical reviews are conducted to assess compliance with planned routes and to identify potential areas for system improvements.

Responsibility for the test area

The test area manager is responsible for implementing local procedures and policies that comply with national regulations and support safe drone operations.

The person responsible for the test area ensures that all drones are equipped with the necessary communication and navigation systems.

The person responsible for the test area ensures that when information about activation is received, i.e. one week before flight, that direct contact is also made with the Swedish Air Ambulance (SLA) to reduce the risk.

for misunderstandings in the airspace and increase safety for all parties. These should be notified via their base email: gallivare@hems.se and lycksele@hems.se and by phone 0910-779055. The contact should be repeated the day before the scheduled flight.

To ensure that the information is correct, tests must be carried out quarterly by telephone and email, both from the person responsible for the test area and also from SLA to the tower.

When flying VLOS, outside the description of this manual, the area is not activated. However, if more extensive planned VLOS flights occur, contact SLA can be made prior to flights.
now.

2.4 Transponder requirements

All drones flying in the area must be equipped with a functioning transponder according to ADS-L, ADS-B-in and/or other systems approved by the person responsible for the test area.

2.5 Information AIP

The area is covered by an active D-area/geographic UAS zone ESD821 SKELLEFTEÅ VIKEN UAS which is presented in the AIP Supplement during the validity period of the permit.

Temporary danger area ESD821 SKELLEFTEÅ VIKEN UAS is established for UAS flying beyond visual line of sight (BVLOS).

Information about the status of operations in the area can be obtained from ATS Skellefteå at Skellefteå City Airport AB TEL 0910-57690 and <https://skellefteairport.se/om-flygårdingen/#flyga-dronare>

2.6 Restrictions

2.6.1 Height restrictions

In the box, drone flying applies up to 400 feet GND or 120 m above ground level. For the flight area in the box, drones must have a buffer zone to the upper limit of the D-area.
minimum 500 feet.

2.6.2 Side restrictions

For the flight area in the box, a buffer zone applies to drones to the outer boundary of the D-area. This buffer zone is determined based on the drone operator's operational status.

3. Drone operation in the D-area

3.1 Basis for flight

Drones are only allowed to fly in Area D. The drone must have an operational permit to operate within The D area with specified safety margins.

3.2 Basic communication requirements

Drone pilots must ensure continuous contact with the air traffic control tower at Skellefteå Airport. If contact is lost, the drone must land at the nearest safe landing site as soon as possible. This communication must be ensured by VHF radio and the drone operator must have an operator who handles this communication during drone flight in the D-area.

3.3 Airspace conflict

In the event of a conflict with another aircraft, including skydivers, the drone must descend to the lowest possible altitude as soon as possible and perform a safe landing.

Conflict means: Drones and airplanes/helicopters/parachutists are simultaneously within the D-area.

4. D-area

4.1 Purpose of the established D area/geographic UAS zone

The D-area aims to be an informative area for safe aviation for aviation operations on and adjacent to the test area.

4.2 D-area in coordinates:

Outer zone



Coordinates for the above:

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644445N 0205655E

The highest point in the area is about 270 meters.

4.3 Information about D area in AIP etc

The D area is presented in the AIP Supplement, AIP SUP 263/2025.

Activation of the area takes place via AMC Sweden via email address amc.sweden@lfv.se which must be done no later than 12.00 the day before the planned activity. When the area is activated, a telephone number for ATS Skellefteå: 0910-57690 will also be active. This number can always be reached during planned opening hours.

The documents are published on Skellefteå Airport's website.

5. Flight safety personnel at active D-area

5.1 Test manager for the test area

For all drone flights in the D area, a test supervisor must be present. This person must have the right skills, qualifications and equipment.

5.1.1 Task

Minimize flight safety risk for manned aircraft through information to aircraft.

1. Ensure that the drone pilot receives adequate information to land the drone as soon as other traffic approaches the test area.
2. Maintain direct contact with the drone operator via mobile phone.

5.2 Drone operator

5.2.1 Task

A drone pilot designated by the drone operator who meets the operator's operational requirements and other necessary permits to fly within the area. This shall be stated in the drone operator's operational manual and other documents.

6. Risk analysis/scenarios:

Land risk:

The land area is characterized by forest, meadows and farmland with a few scattered houses.

The population density is low, below 500 inhabitants/km² according to the Swedish Statistics Committee.

The risk of collision with a third party on the ground is assessed as very low.

Safety landing sites should be assigned where drones can land in the event of link loss.

• How is surveillance of drones ensured during flight?

Drone operator ensures surveillance of drones during flight. If contact with drones is lost during flight, the drone shall be pre-programmed to land at predetermined locations within the area.

- **How is control of all incoming and outgoing persons ensured?**

airplanes and helicopters regardless of whether they fly IFR, Special VFR or VFR?

Manned flight in area D is not prohibited. The area is active during the test period with information in AIP SUP to inform other traffic about ongoing activities. ATS at Skellefteå Airport is available to provide continuous information to aircraft about drone positions and activities.

- ***What happens when contact with the drone is lost during flight?***

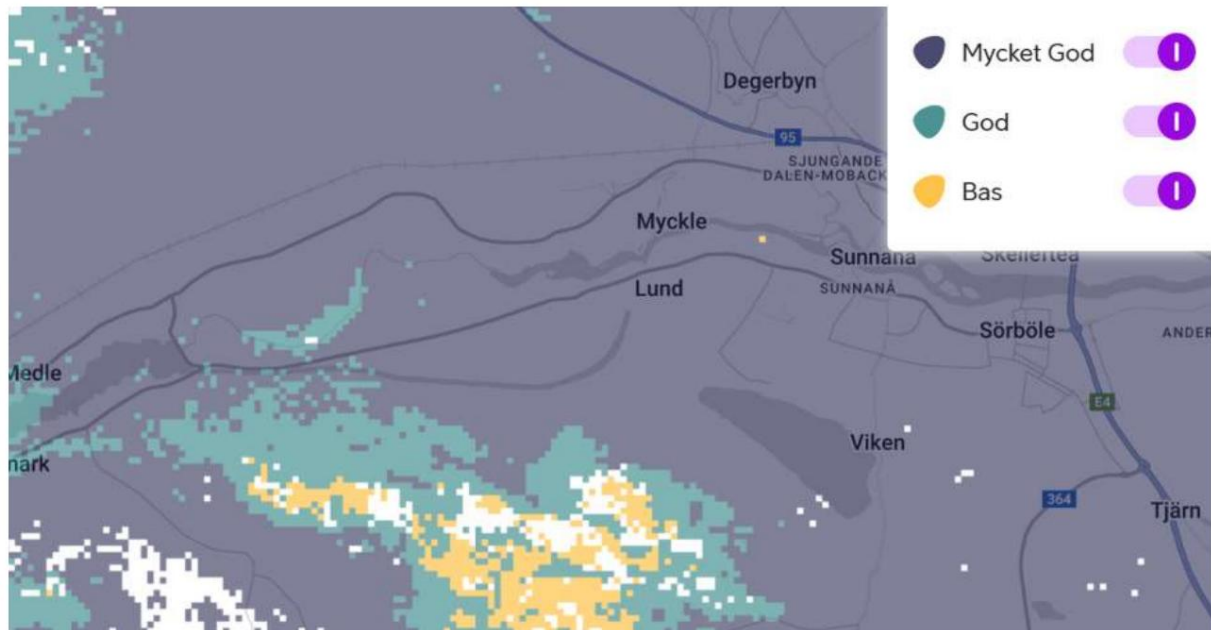
As soon as contact is lost with a drone in the D-area, a safety landing must be carried out as soon as possible.

- **Electrical wiring**

Type of power lines passing through the area, i.e. low poles and wires in a power street, approximately 15-22 meters high in a 40 meter wide street.
152 kV line.



Mobile coverage in the area



How to facilitate helicopter operations

The choice of coordinates is made so that they are significant points for the pilots that are visible in the terrain. This makes it easy to orientate yourself. In the East, road E4 is used as a significant delimiter. In the South, the control zone boundary for ESNS is the limitation. In the East, the mountain is the clear delimiter and in the North, the Skellefteå River is the delimiter. On the most frequent missions Lycksele-Skellefteå-Umeå, the ambulance helicopter will often be able to completely avoid flying in the D area with small adjustments to the flight path,

1. Bridge anchorage south of the Skellefteå River
2. Point east of Drone port. Burträskvägen. The intention is for the helicopter to follow road E4 with a slight margin to the D area.
3. The northern point of the golf course.
4. Undefinable point for the pilot but lies in the extension of the ESNS CTR limit.



5. Highest point on the mountain.

6. Southern part of the dam over the Skellefteå river



Images, higher resolution, of the visual breakpoints that facilitate helicopter operations:









Topography

<https://sv-se.topographic-map.com/map-6dr1tf/Skellefte%C3%A5/?center=64.73029%2C20.86738&base=2>

The take-off and landing area is located 54 meters above sea level.

The highest point within the proposed area is approximately 270 meters above sea level.