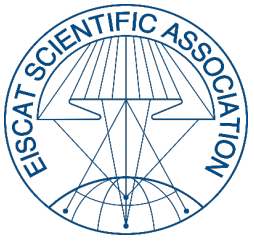


# EISCAT 3D

---

## BUILDING REQUIREMENTS PRESENTATION



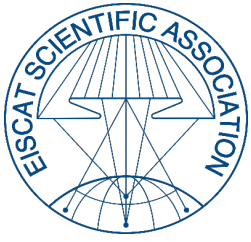
# AGENDA

---



This is an open presentation covering:

- Short presentation of who we are
- Bidding procedure
- Short presentation of what we will build
- Buildings technical description
- Schedule
- Questions

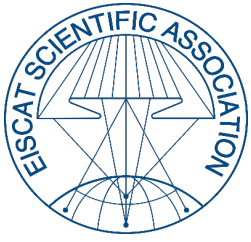


# EISCAT

---

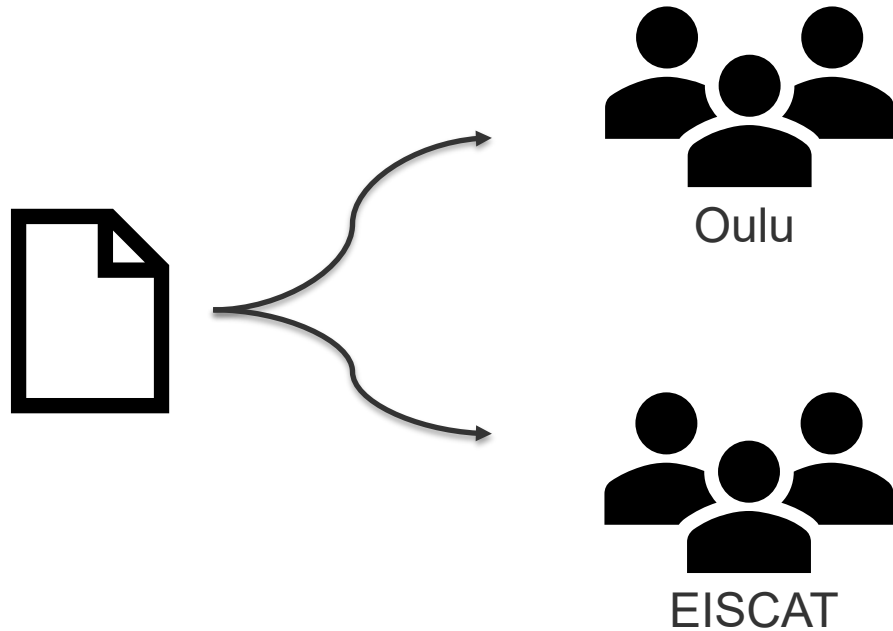


- EISCAT Scientific Association is a non-profit association
- Present Locations: Tromsø (NO), Sodankylä (FI), Kiruna (SE), Longyearbyen (Svalbard)
- Headquarters in Kiruna, Sweden
- EISCAT is represented by Johan Svensson, Henrik Andersson, Craig Heinselman
- University of Oulu is represented by Thomas Ulich, Satu Kuokkanen, Risto Ruokamo



# BIDDING PROCEDURE

---

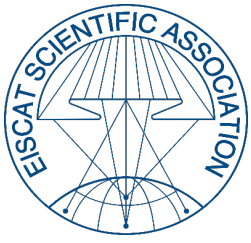


Public procurement

Two procurement entities - EISCAT and University of Oulu.

It is mandatory that a bid includes a house and a garage at one site as minimum

Options:  
Sites 2 and 3



# EISCAT 3D – PHASED ARRAY RADAR

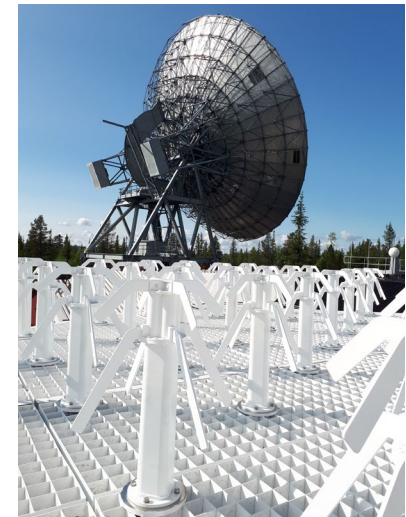
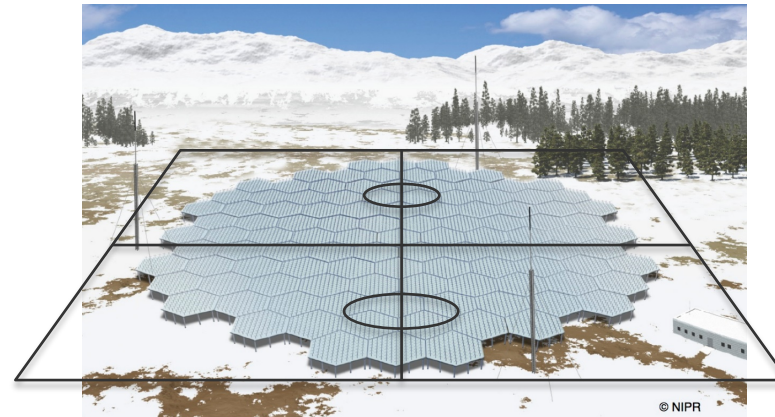
EISCAT\_3D is a new scientific radar system for atmospheric research

The old dish-antenna based system is replaced by a phase-array system

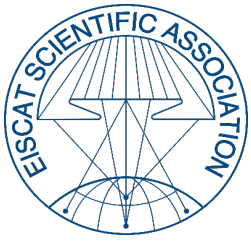
One site is approximately 120x120 meter and the core antenna is 80 meter in diameter

The core antenna has 10.000 antenna elements, and is built-up by 109 hexagon subarrays

2 buildings per site, one house and one garage





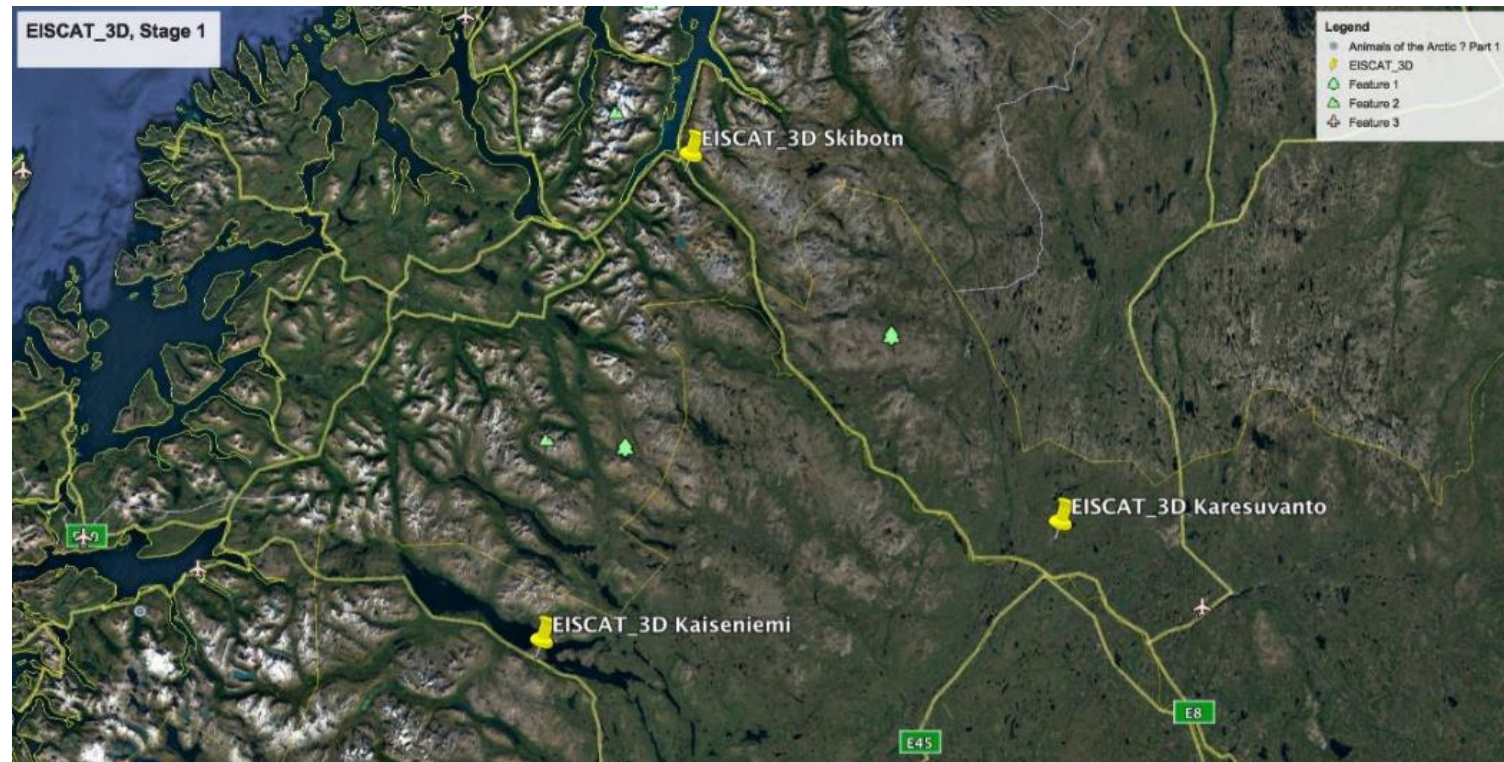


# EISCAT 3D – SITE PLACEMENTS

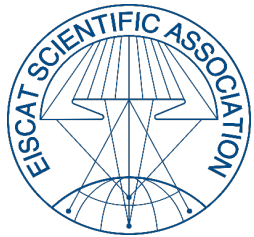
Transmit and receive in Skibotn , Norway (7,5MW)

Receive-only in Karesuvanto, Finland

Receive-only in Kaiseniemi, Sweden (TBC)







# AN EISCAT\_3D SITE

---

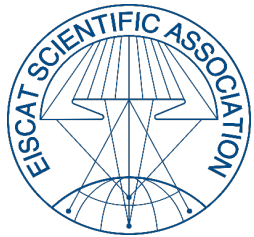


Skibotn

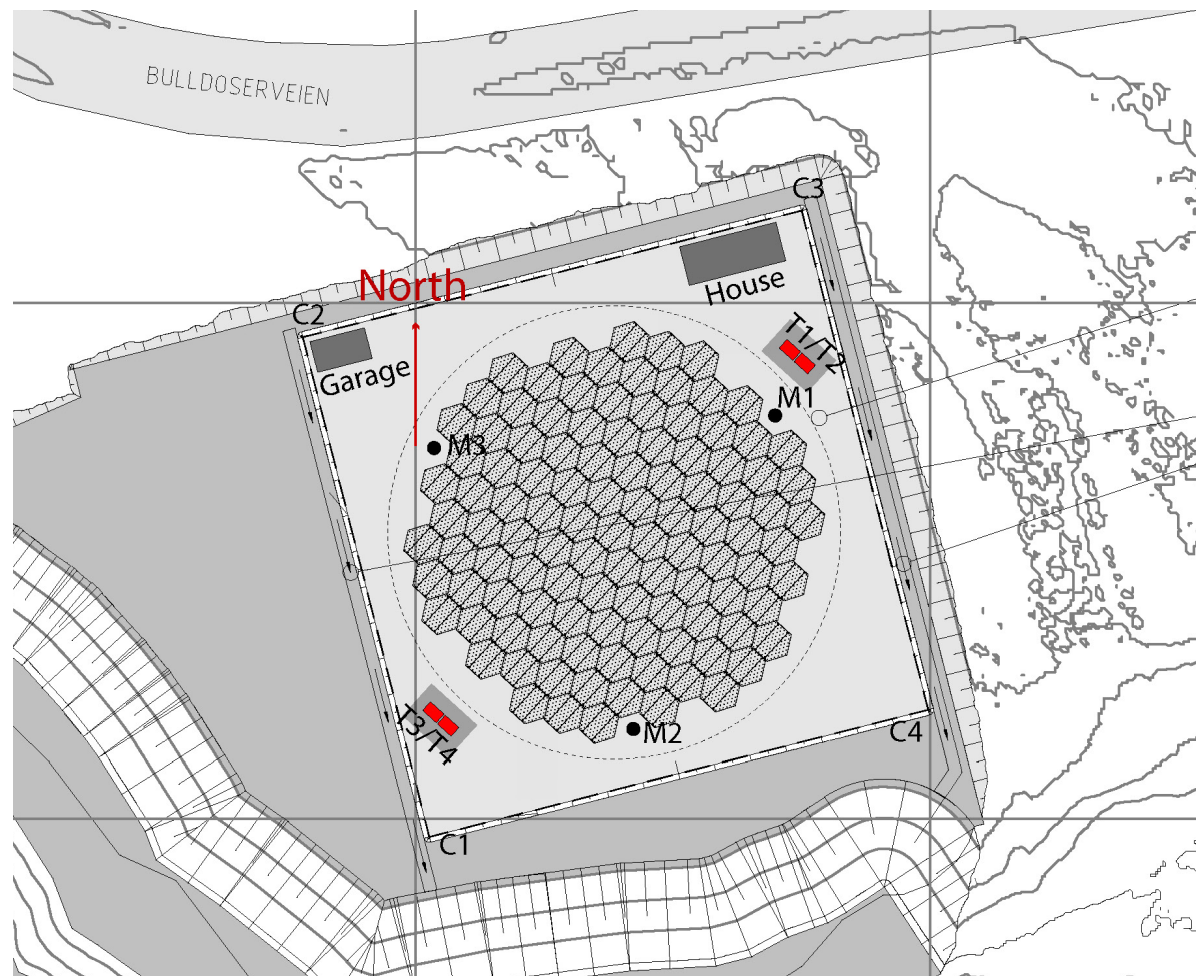


Karesuvanto



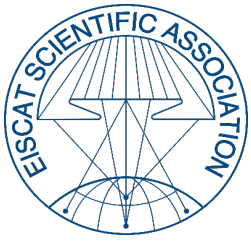


# AN EISCAT\_3D SITE



Skibotn

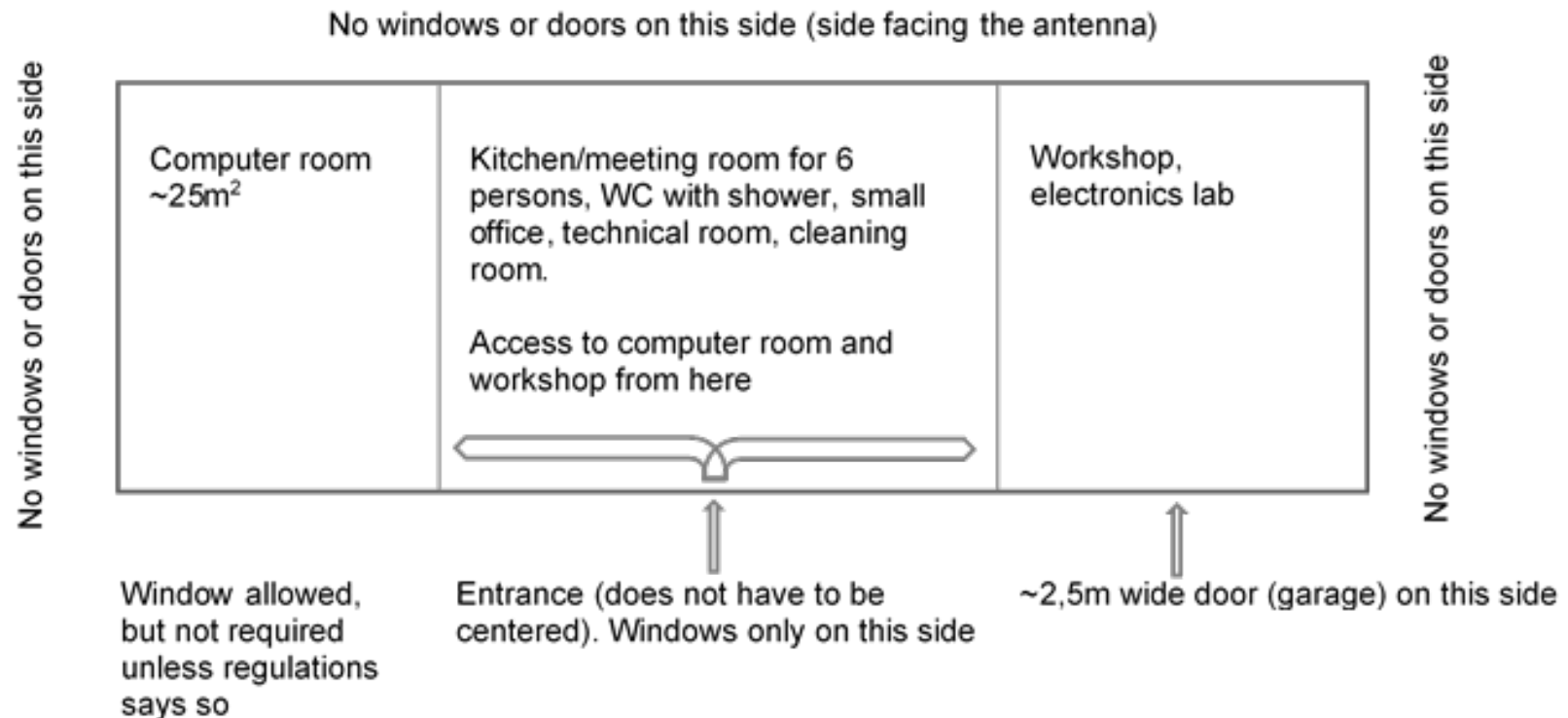


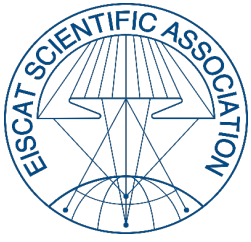


# HOUSES

The houses are the same for all three sites. It can be one house, or separate blocks mounted together.

In short, we need a computer room, a workshop and electronics lab combined, an area that allows for a combined kitchen and meeting room, WC and shower, a technical room and a cleaning room.





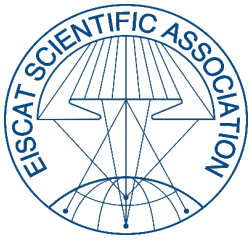
# GARAGES

---

The three garages on concrete foundations are needed as storage for an ATV and/or a tractor and will occasionally be used as a workplace for e.g. welding and other similar work.

We foresee a building similar to a standard garage of approximately 60m<sup>2</sup> and may therefore be a suitable subcontract object for reducing costs.

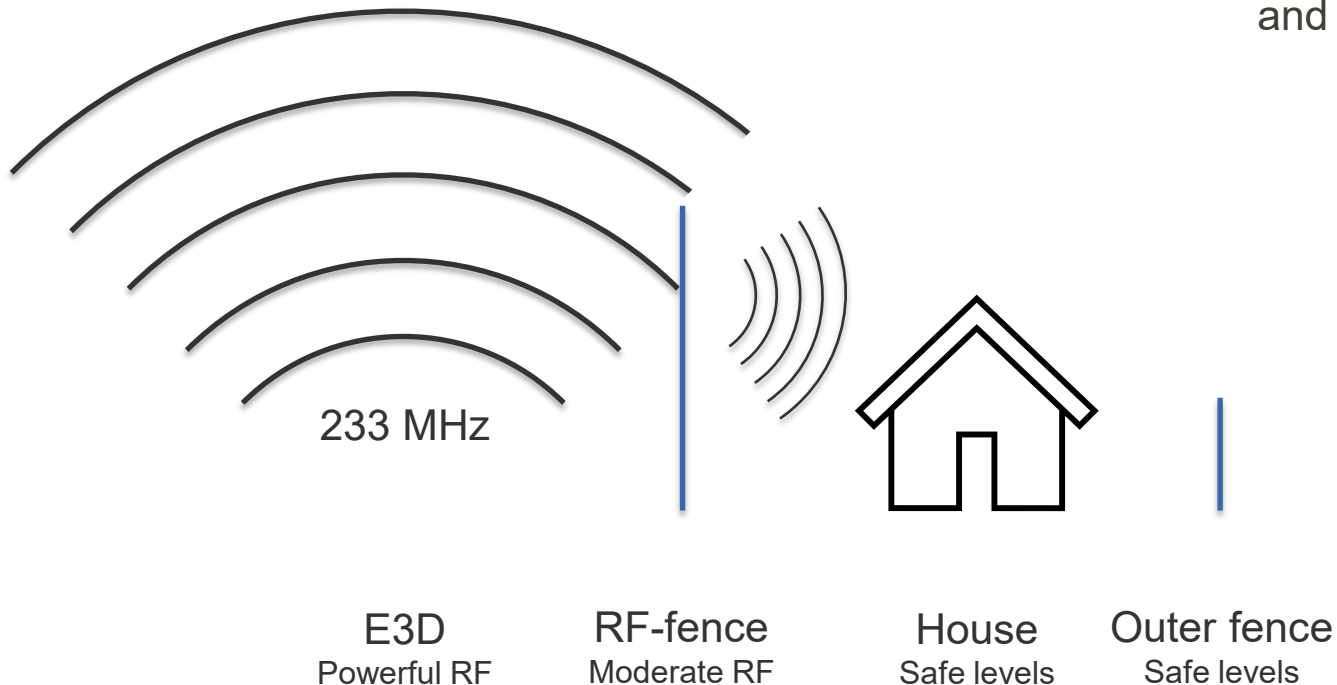




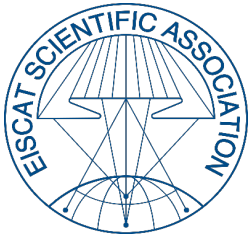
# RF-SHIELD

Excessive RF radiation may affect sensitive equipment and humans inside the house; therefore, a RF-shield is required.

The RF-shield must enclose the house internal (no gaps) and be electrically conductive.

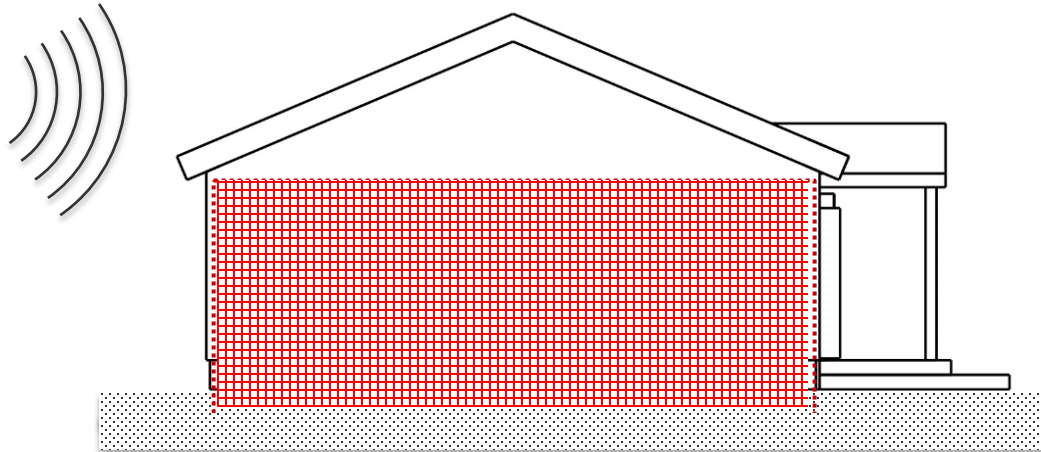






# RF-SHIELD

---

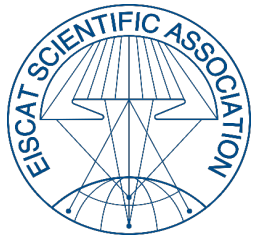


House with a continuous net as part of the wall and roof construction

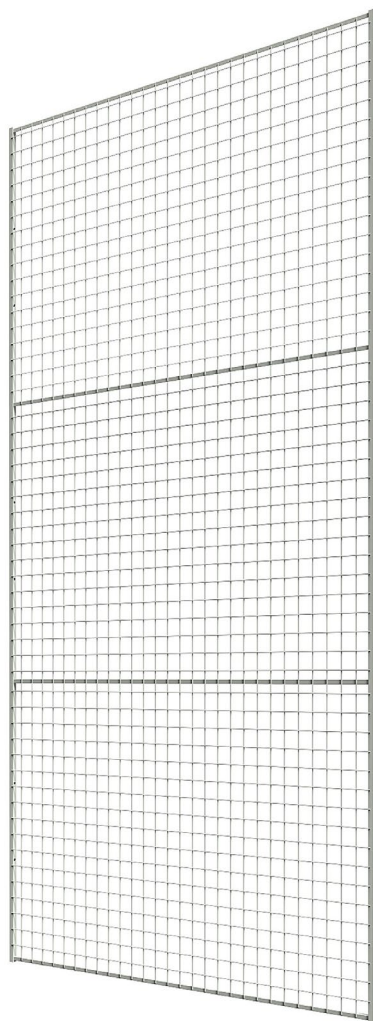
All outer walls, foundation facades and inner roof must have a continuous metallic layer for the shield to work. All shield sections must overlap and be electrically connected every 150mm (e.g. by soldering, point welding, nails etc).

Doors and door frames in metal will provide the shielding and there are special windows made for this purpose.

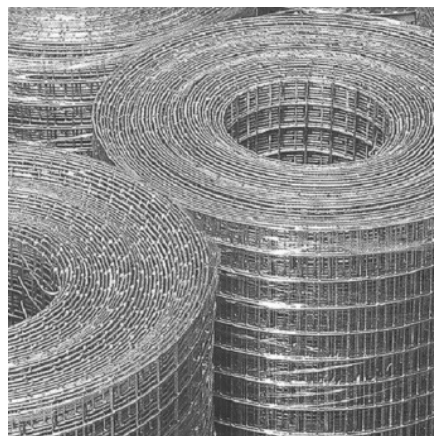
EISCAT will be of assistance in the process of selecting a proper method for the shield.



# RF-SHIELD



Welded grid 10x10cm or smaller



1010mmx19mmx19mmx1,45mm

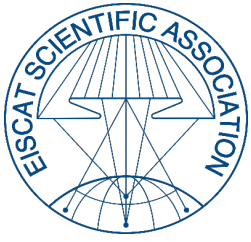
The shield may be constructed from standard welded nets built-in into the walls and inner roof construction.

The easiest way to shield the doors is by using metallic doors and frames. There may be a need for some RF-sealing between the door blades and frames, which will be looked at ones we have more details.

There are special RF-shielded windows e.g. from Skellefteå Snickericentral. One other solution may be to have a metallic screen-door outside the windows.

The shielding requirement for windows and doors are often defined as attenuation in dB for a frequency range.

-20dB or better in the range 200-250MHz



# COMPUTER ROOM

---



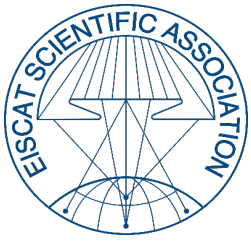
All details are mentioned in the technical description, but we would like to highlight:

A cooling system dimensioned for 50kW. Needed in Skibotn but can be prepared for but leaved out for the Sweden and Finland sites.

Excess heat should be used for heating the rest of the house via the liquid-based heat distribution system.

Opening for optical fibers (130pc) through the outer wall or the floor if it is accessible for maintenance. Exact location will be decided in the detailed design phase.





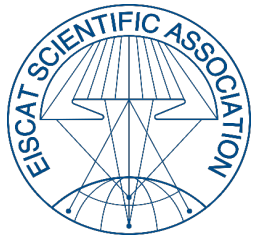
# SCHEDULE

---



- 3 weeks bidding period, opens next week, selection before Christmas
- Drawings for permit applications during Q1 2021
- Buildings in Skibotn, no later than summer 2021
- Antennas in Skibotn, autumn 2021
- Buildings in Karesuvanto, summer 2021 or summer 2022
- Antennas in Karesuvanto, summer 2022
- \*Buildings in Kaiseniemi, summer 2022
- \*Antennas in Kaiseniemi, summer 2022

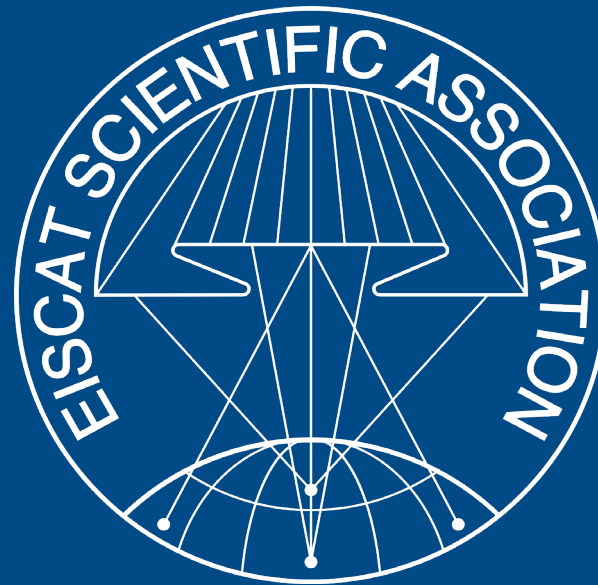
\* Depends on a building permit which we don't yet have



# QUESTIONS

---





EISCAT SCIENTIFIC ASSOCIATION