



Troll Station: Research

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Location

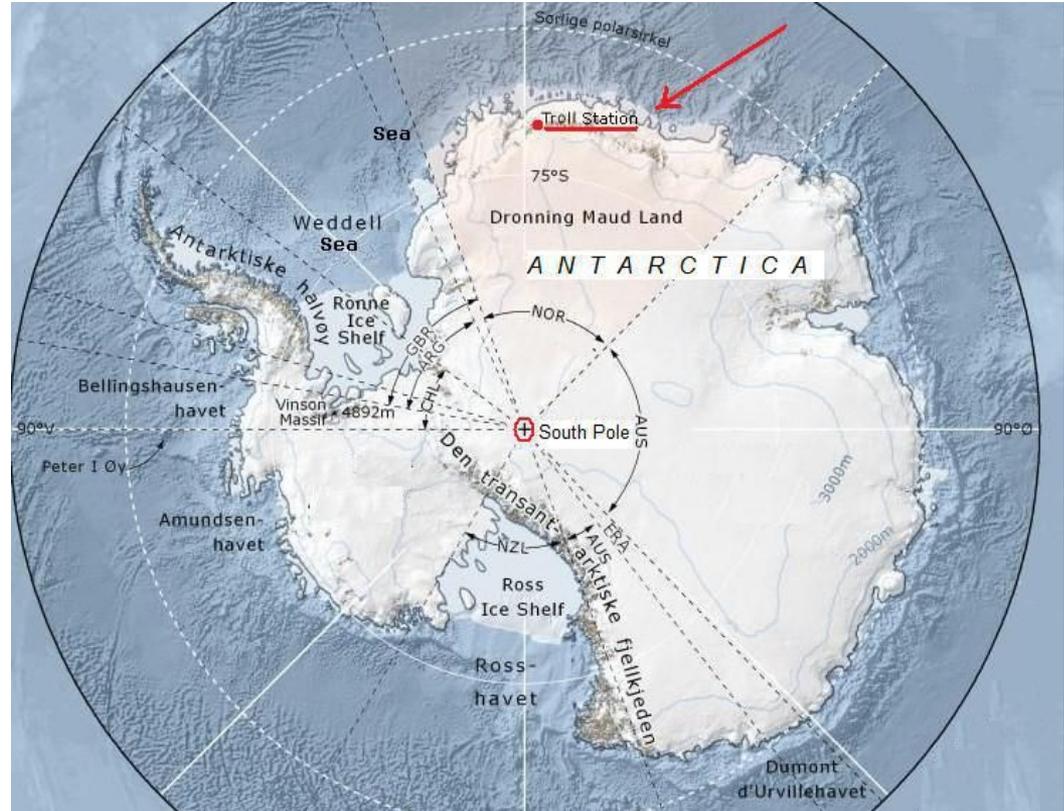
-About 235km from the coast

This is a distance that takes about 3-5 days by tracking vehicle

-1270m above sea level

-Built on solid rock

-Entirely surrounded by antarctic ice sheet.



Logistics

Plane



Arctic Summer
twice a month
November – February (4 months)

Ship



Arctic Summer
annually
January

Logistics

Arctic Summer

November – February (4 months)

80 people, communal

Arctic Winter

March – October (8 months)

8 people, isolation

Logistics

Water

snow melting, waste heat recovery, insulated storage tanks, closed-loop system

Food

annual ship resupply, frozen and dry storage, winter stockpiling, ration planning

Waste

waste sorting, compaction, sealed storage, annual removal

Toilet and Washing

low-flush toilets, closed wastewater tanks, greywater management, seasonal removal

Heating

diesel generators, waste heat reuse, high insulation, energy efficiency

Ventilation

mechanical ventilation, heat recovery, controlled airflow, indoor air quality

Occupation/People

Amount of people:

Summer: 80 +- people

Winter: 6 people

Working Hours: 12 hours 7 days a week (every second sunday off)

Communal activities:

Shared meals in the communal dining hall everyday, gatherings with storytelling/music, small library with novels and polar expedition journals

Different types of research at the station:

- 1) Meteorology: (Used for weather forecasting) manual observations 3 times a day
- 2) Radiation: Insolation and radiation from sunlight and infrared light
- 3) Wildlife observation: Researchers led by ornithologists from the Norwegian Polar Institute visit the area annually to study the population, and strategies for nest-building.
- 4) Glaciology: Different projects- examination of drifting ice shelves and ice rises.
- 5) Atmosphere: (At the atmosphere observatory) The work at the observatory includes characterising the composition of the atmosphere
- 6) Seismology: Has a broadband seismometer
- 7) Ionosphere and space weather: (in processing)
- 8) International research collaboration: Troll also facilitates international research collaboration, and in recent years the station has served as a base for microbiologists and geologists from South African universities, as well as a glacial geological project from Japan.

Staff besides research: Chef + Medical personnel, Electricians/Mechanics?

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Functions

Main Building:

Main building has six bedrooms, a gym, a sauna, a large kitchen, a communication center, and **office spaces available for overwintering**



Sleeping quarters

current interior spaces



Kitchen

current interior spaces



Communal seating space

current interior spaces



Communal dining space

current interior spaces



Working spaces

current interior spaces



Medical room

current interior spaces



Workshop space

current interior spaces



Similar Structures

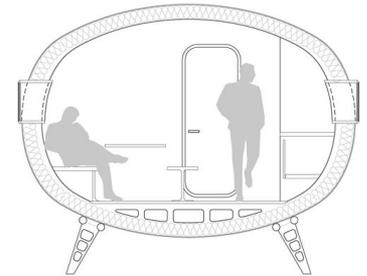
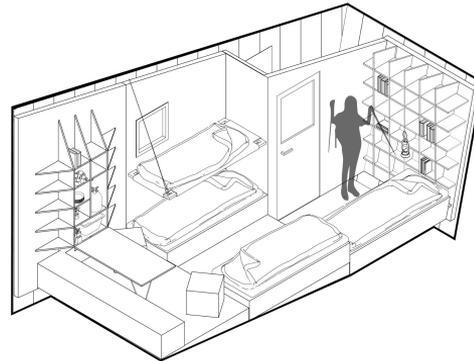
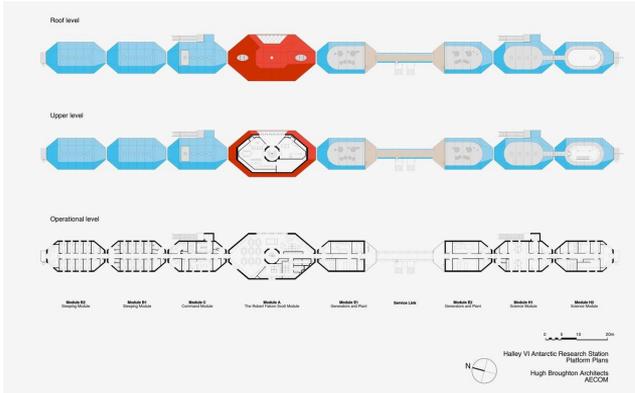
Halley VI British Antarctic Research Station



hikers' cabin above an Alpine valley in Italy



New Refuge Gervasutti



Examples of voronoi and foldable



Rules and Functions

Individual retreat

**Possibility for
personalization**

**Worst case scenario
layout (113 hours (~4.7
days))**

Rules and Functions

Inc

High-performance personal micro-environment

Possibility for
personalization

Worst case scenario
layout (113 hours (~4.7
days)

24/7 Activities

Track A: Working day

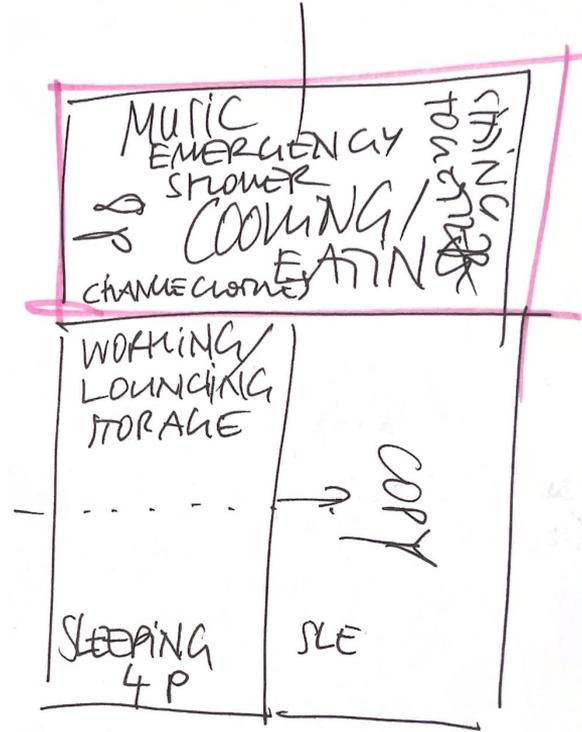
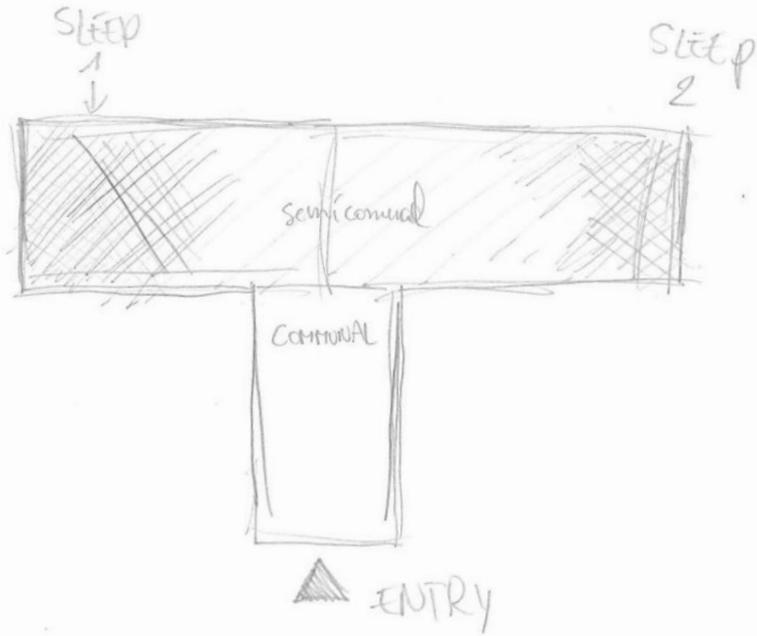
High-intensity circadian stimulation and rigid spatial deployment for cognitive-heavy tasks and laboratory routines

Track B: Rest day

Low-intensity adaptive lighting and fluid spatial configurations for physical wellbeing, social interaction, and mental decompression.

TIME ZONE	TRACK A: TYPICAL WORKING DAY	TRACK B: FREE DAY / REST & RECOVERY
00:00 - 07:30 (Deep Rest)	Activity: Deep Sleep D2RP Space: "Sleep" Mode (Max enclosure, acoustic isolation). D2RO Light: 0 Lux (Total Darkness) or Deep Red glow (if movement detected).	Activity: Deep Sleep D2RP Space: "Sleep Cocoon" Mode. D2RO Light: 0 Lux / Deep Red.
07:30 - 08:30 (Bio-Boot)	Activity: Wake-up, Hygiene, Coffee/Breakfast D2RP Space: "Niche Opening" (Partial unfold of the structure). D2RO Light: Sunrise Simulation. High Intensity Blue-Enriched (Melatonin suppression).	Activity: Slow wake-up, longer breakfast, reading. D2RP Space: Same as working day, but slower transition. D2RO Light: Sunrise Simulation. High Intensity Blue-Enriched.
08:30 - 09:00 (The Transition) Optional	Activity: Dressing in Extreme Gear (Mudroom function) D2RP Space: "Technical Bench" Mode (Reinforced seating & heavy storage access). D2RO Light: Bright, functional white light (Visual clarity for gear check).	Activity: Light stretching, personal organization. D2RP Space: "Open Floor" preparation. D2RO Light: Neutral white light.
08:30 / 09:00 - 13:00 (Core Activity)	Activity: DEEP FOCUS WORK D2RP Space: "Workstation Deployment" (Rigid folding desks & ergonomic seating pull out from wall). D2RO Light: Cool White, High Lux (Max cognitive performance).	Activity: FITNESS & CREATIVE LEISURE D2RP Space: "Retracted / Open Floor" Mode (Max space for movement/VR) OR "Hobby Niche" (Integrated instruments revealed). D2RO Light: Dynamic White (Adapts to activity intensity: bright for fitness, softer for reading).
13:00 - 14:00 (Nutrition)	Activity: Quick Lunch & Prep D2RP Space: "Compact Dining" (Small surface unfold near kitchenette). D2RO Light: Neutral white.	Activity: Communal Cooking & Relaxed Lunch D2RP Space: "Expanded Kitchen/Social" Mode. D2RO Light: Warm-Neutral (Social atmosphere).
14:00 - 17:30 (Core Activity)	Activity: FOCUS WORK / LAB TASKS D2RP Space: "Workstation Deployment" (Continued). D2RO Light: Cool White (Sustained alertness, mimicking Delft afternoon).	Activity: SOCIAL GAMING / LOUNGE D2RP Space: "Lounge Landscape" (Soft, inclined facets unfold for group seating and screen viewing). D2RO Light: Warmer tones, medium intensity.
17:30 - 19:30 (Social Wind-down)	Activity: Shower, Community Dinner, Debrief D2RP Space: "Community Hub" Mode (Max open configuration for group dining). D2RO Light: Sunset Transition. Shifting from neutral to warm amber (Preparing body for rest).	Activity: Extended shower, elaborate dinner party. D2RP Space: "Community Hub" Mode. D2RO Light: Sunset Transition. Warm amber, cozy atmosphere.
19:30 - 22:00 (Evening Leisure)	Activity: Relax, Reading, Music, Personal storage access D2RP Space: "Soft Lounge" (Individual nooks for privacy within the shared space). D2RO Light: Warm Amber, Low intensity (Promoting relaxation).	Activity: Movie night, games, hobbies. D2RP Space: "Media Mode" (Facets align for optimal viewing/acoustics). D2RO Light: Cinematic warm dimming.
22:00 - 24:00 (Sleep Prep)	Activity: Final Hygiene, Sleep D2RP Space: Returning to "Sleep Mode". D2RO Light: Deep Amber fade to Blackout.	Activity: Final Hygiene, Sleep D2RP Space: Returning to "Sleep Cocoon". D2RO Light: Deep Amber fade to Blackout.

Layout Possibilities



Layout Possibilities

Serving facilities / common
space / entrance / Toilet and
shower

Sleeping / Individual time /
4 people

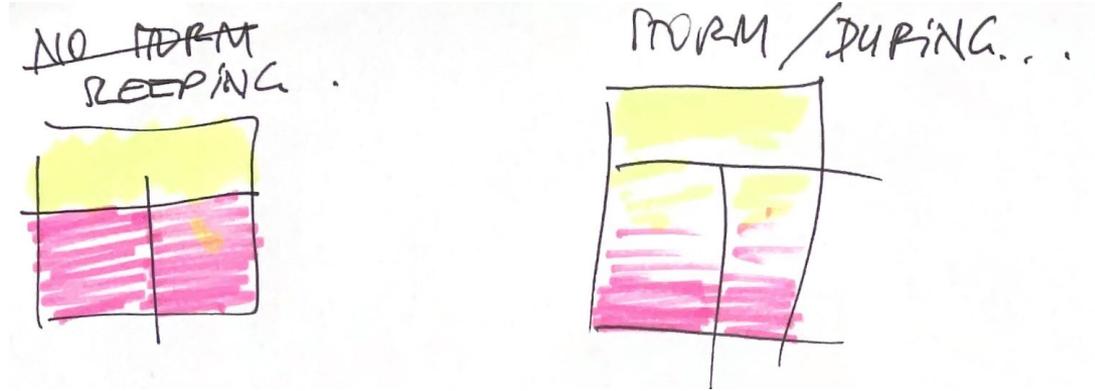
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Layout Possibilities

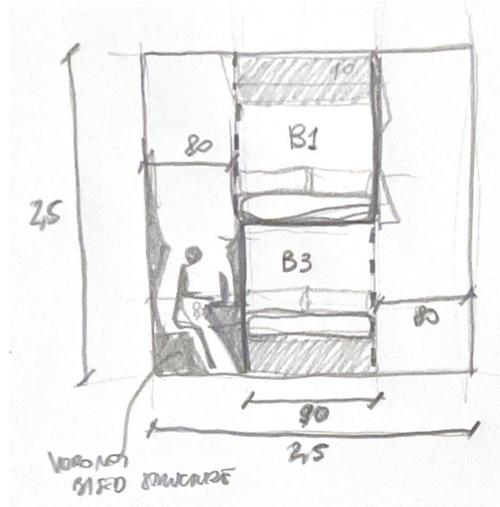
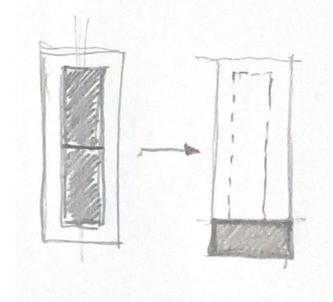
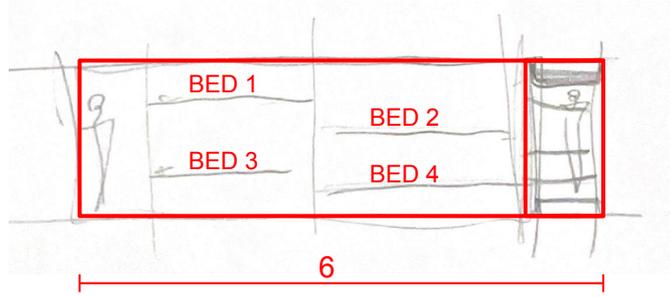
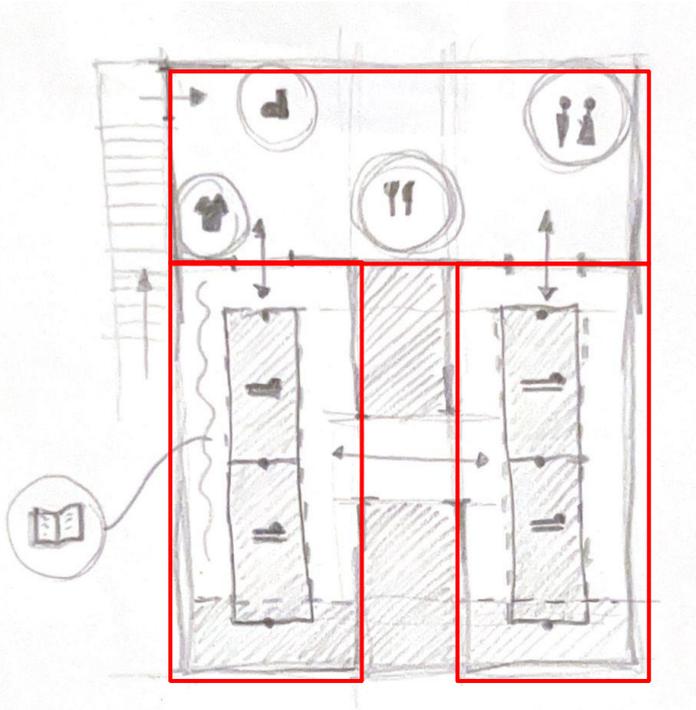
Common



Private



Layout Possibilities



Night configuration



Day Configuration

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