

# TROLL RESEARCH STATION

## Updated Project Proposals week 3

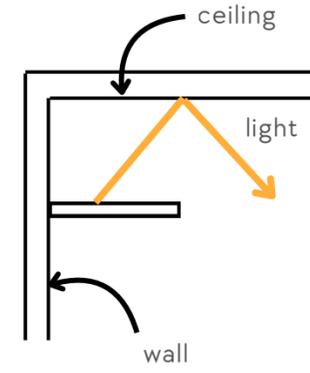
**Group 1:** Iris Claus, Daphne Kamsteeg, Ludovica Perone Pacifico, Chloé Phan, Marieke van Wijk

**IAP Workshop**

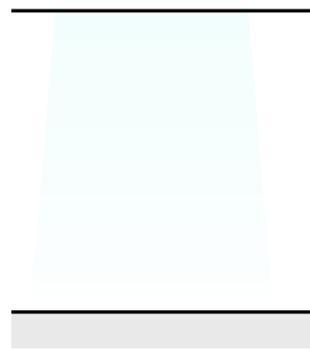
**Q3 2026**

Prof. Henriette Bier, Arwin Hidding, Lisa-Marie Mueller, Vera Laszlo

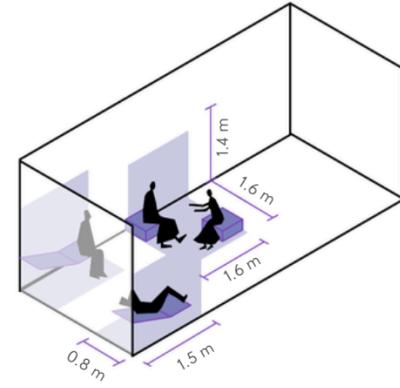
# 01 ACTIVITY MAPPING | 24/7



Diffused light

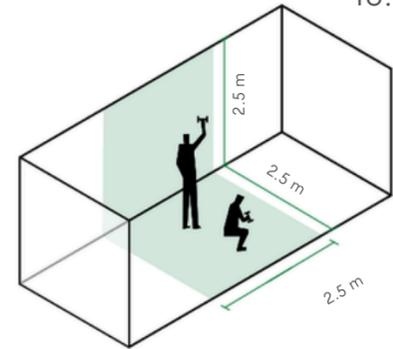


Ceiling uniform light



**Relaxing**  
21.00 - 22.00

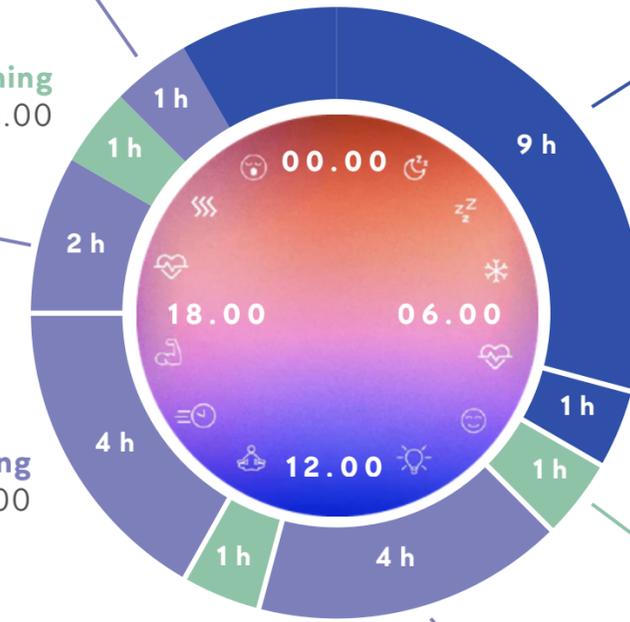
**Relaxing / exercising**  
18.00 - 20.00



Demands **maximum clearance** of floor area.

**Dining**  
20.00 - 21.00

**Working**  
14.00 - 18.00



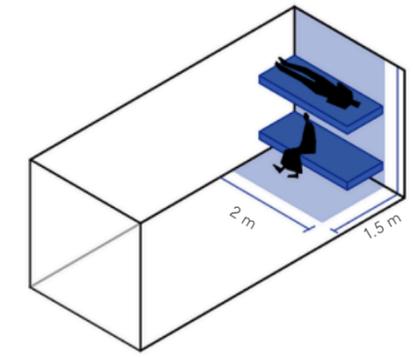
**+ Storage space**  
of personal items, clothing, working equipment.  
Fixed. **Compact**, to maximise space clearance  
**at least two modules**

## Legend

**Individual** peripheral zones

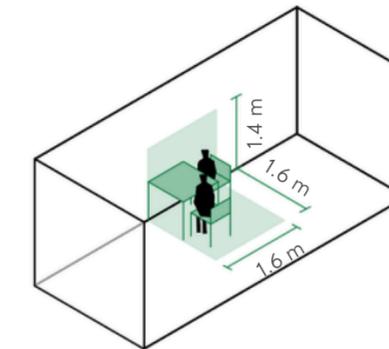
**Collective** central zones

**Both** demand two configurations, one for collective and one for private fruition



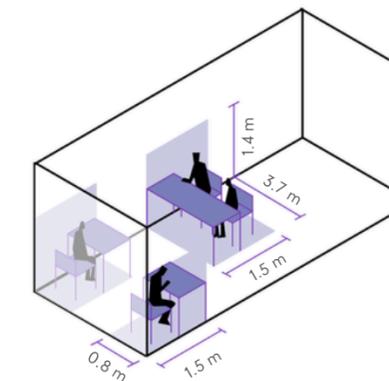
**Sleeping**  
22.00 - 7.00

Highest duration. Lowest frequency, hence must be **folded away or reconfigured**. At **extremities** to minimise daytime circulation interference.

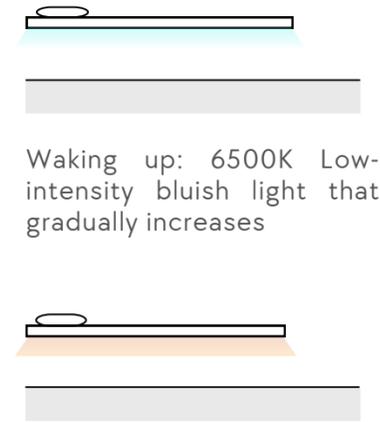


**Hygiene**  
7.00 - 8.00

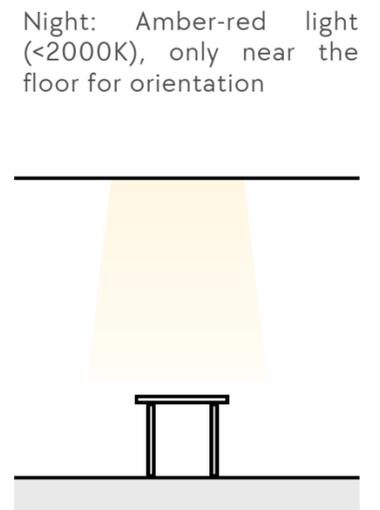
**Dining**  
8.00 - 9.00  
Highest frequency, hence must be **easily accessible**.



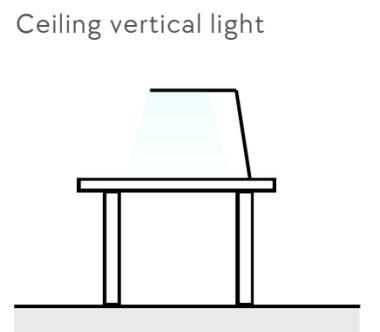
**Working**  
9.00 - 13.00



Waking up: 6500K Low-intensity bluish light that gradually increases



Night: Amber-red light (<2000K), only near the floor for orientation

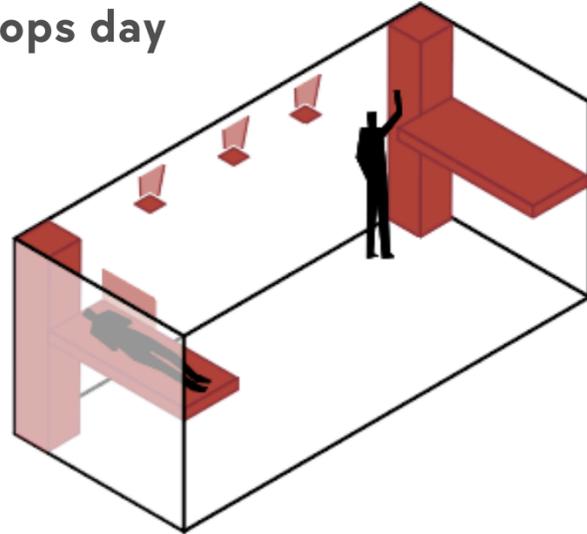


Ceiling vertical light

Cool White, can be adjusted for the light to hit the work surface vertically

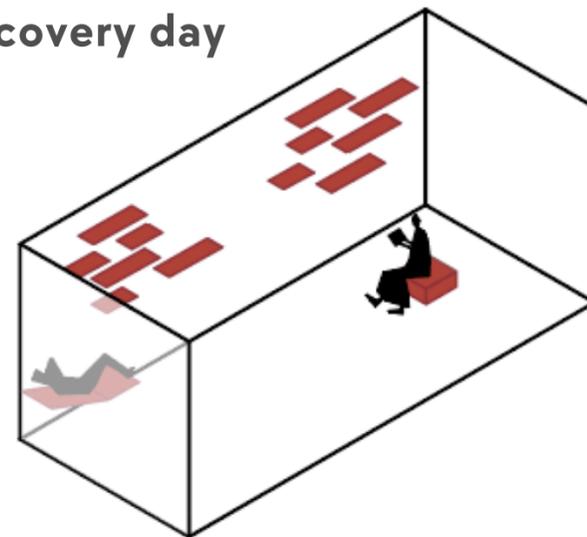
# O2 ACTIVITY MAPPING | SCENARIO ANALYSIS

## 1 - Standard ops day



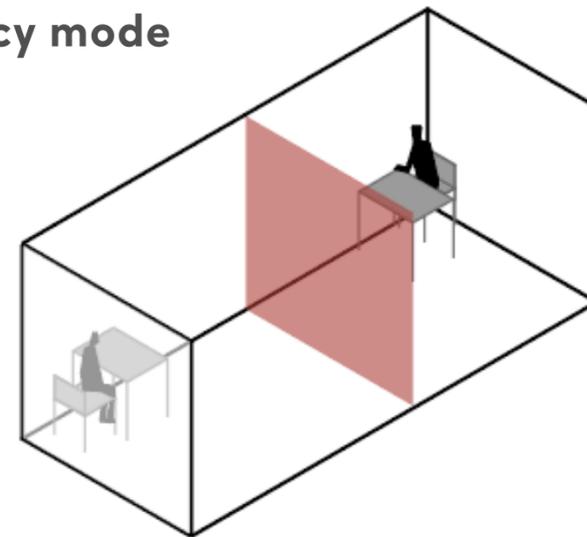
Separate beds with integrated personal storage and privacy separator. For optimized circulation with no functional overlap and light and acoustic shielding in sleeping zone.

## 2 - Active recovery day



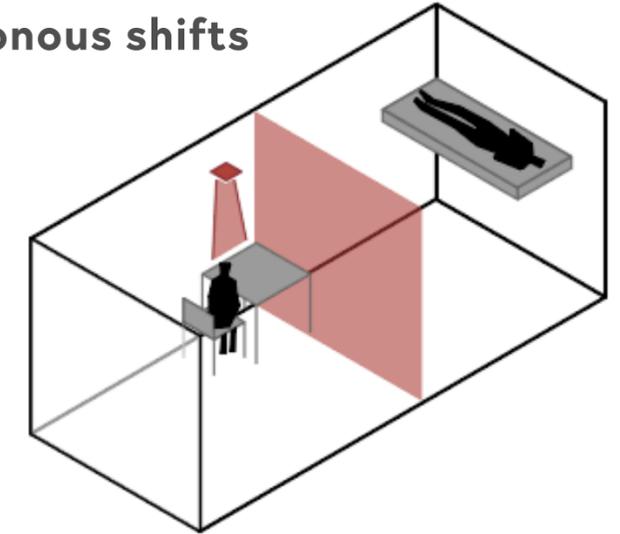
Adjustable modules for user-driven spatial reconfiguration to enable environmental personalization and reduce visual monotony.

## 3 - Emergency mode



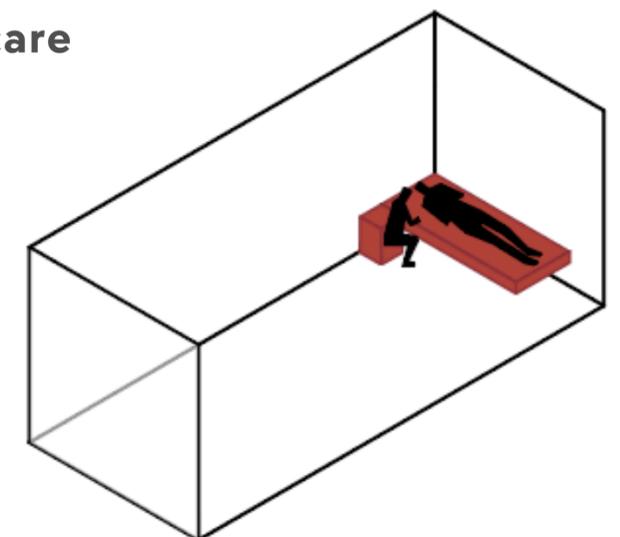
Foldable partition to subdivide container into two private rooms. For increased privacy and psychological benefits during prolonged isolation

## 4 - Asynchronous shifts



Foldable partition to subdivide container into two private rooms.. Independent light control between the two zones. For increase acoustic and light insulation.

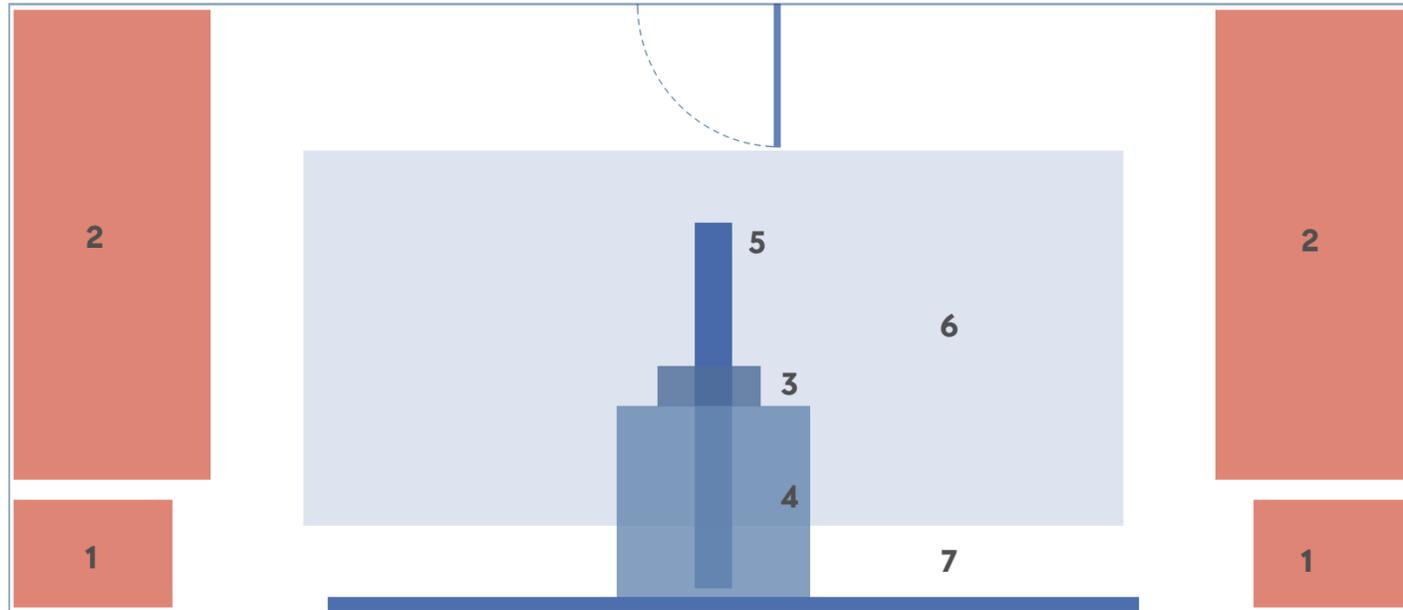
## 5 - Patient care



Bed at ergonomic standing height and integrated bedside surface to enable assisted care.

# 03 ADAPTIVE FURNISHING

## Distribution principles



### Legend

#### "Permanent" furniture

More space-consuming and/or fixed furnitures are placed in peripheral spaces

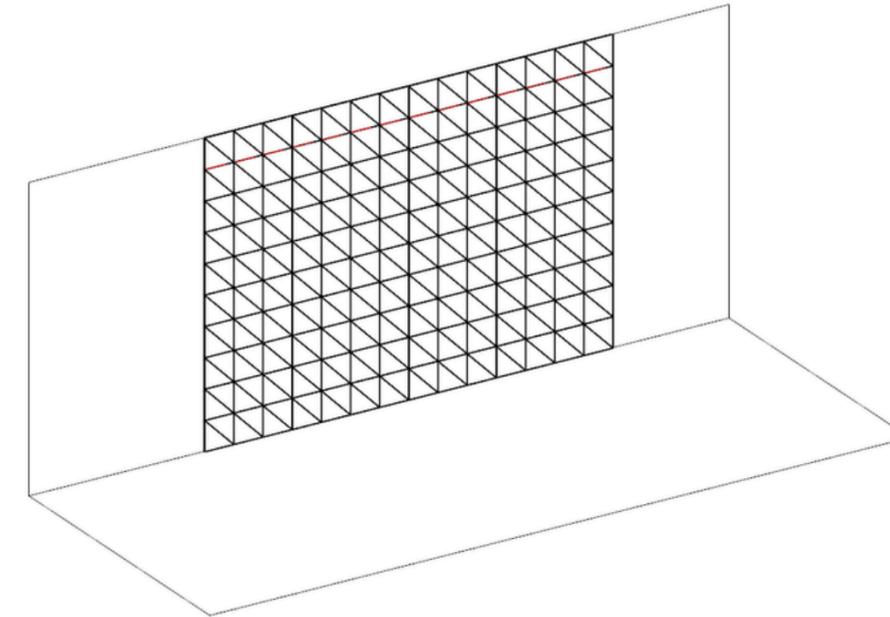
1. Storage 2. Bed and workstation

#### Temporary furniture

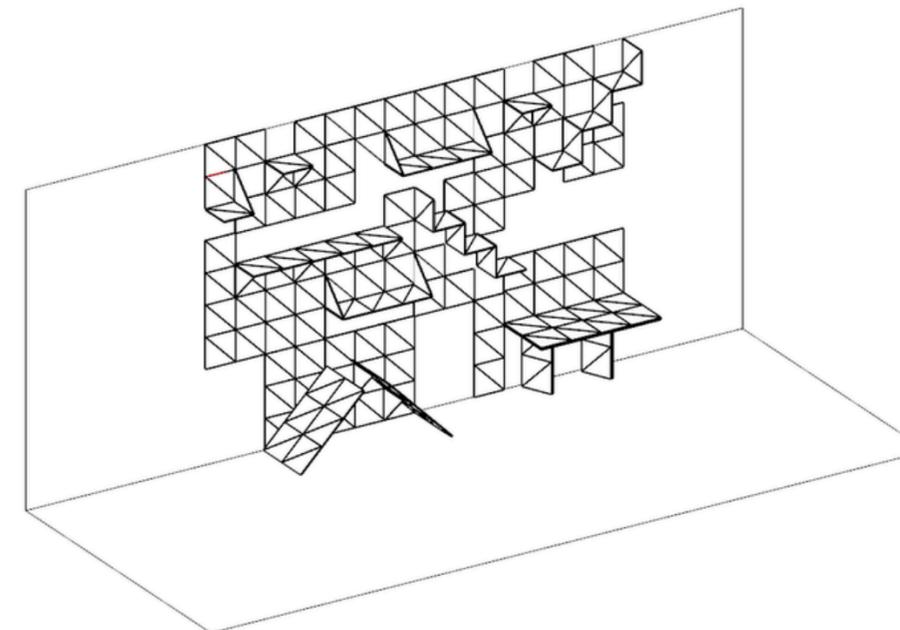
Furniture in the center of the container is easily reconfigurable and can be folded to a surface, for maximum clearance of the space

3. (loung) chair 4. Dining table 5. Room divider 6. Terra peel 7. Multipurpose wall

## Voronoi - orthogonal integration



The cleared space maintains a orthogonal volume to optimise furniture integration and fruition of space



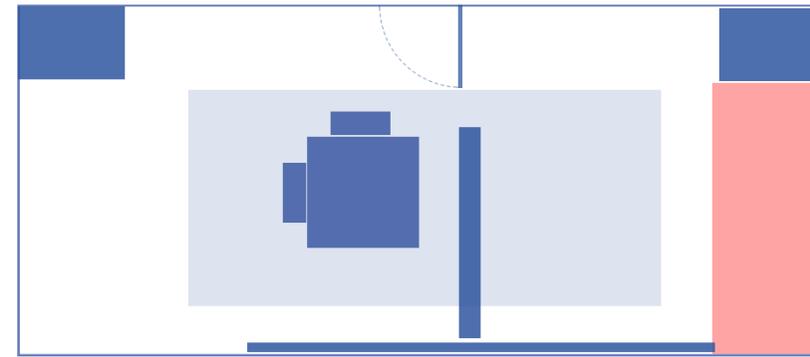
The Voronoi acts as a skin on the walls of the container, allowing for reconfiguration

**Next steps: integrate irregularity in shape**

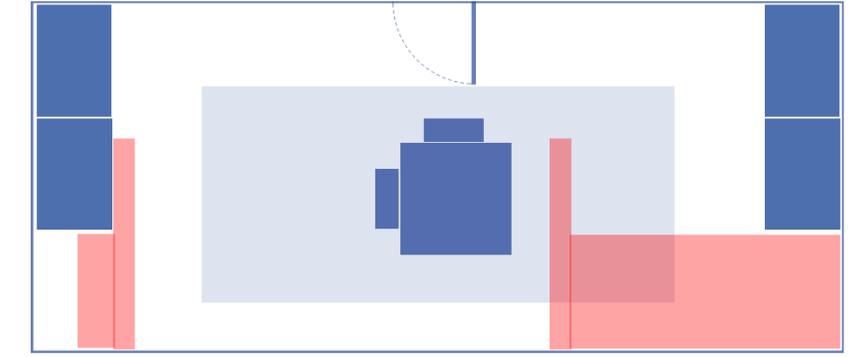
# 03 ADAPTIVE FURNISHING |

## BED

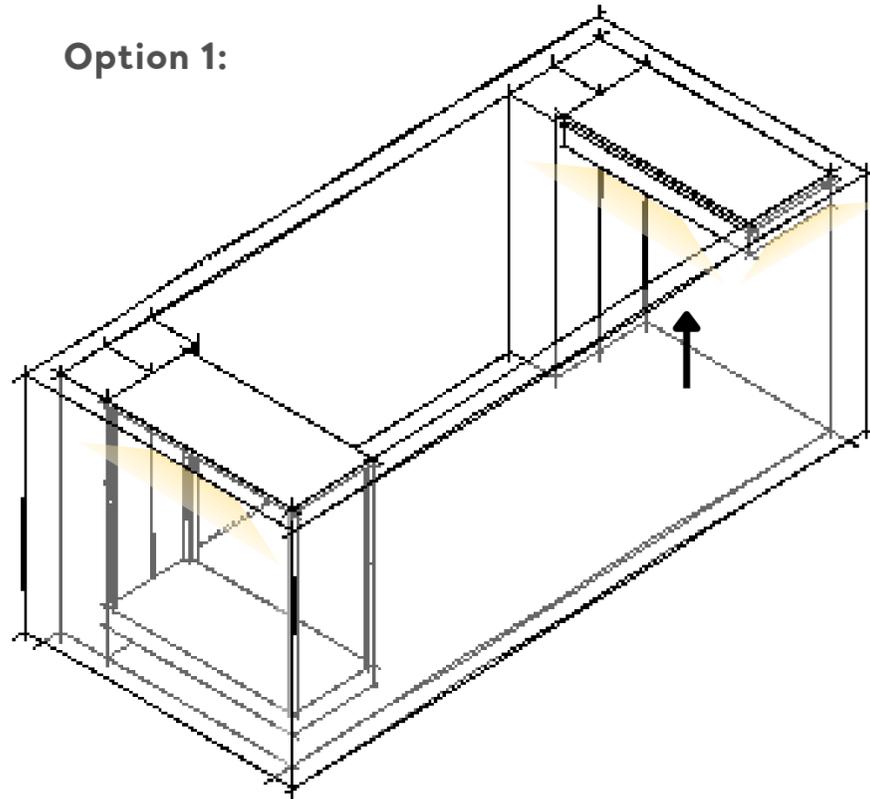
Option 1:



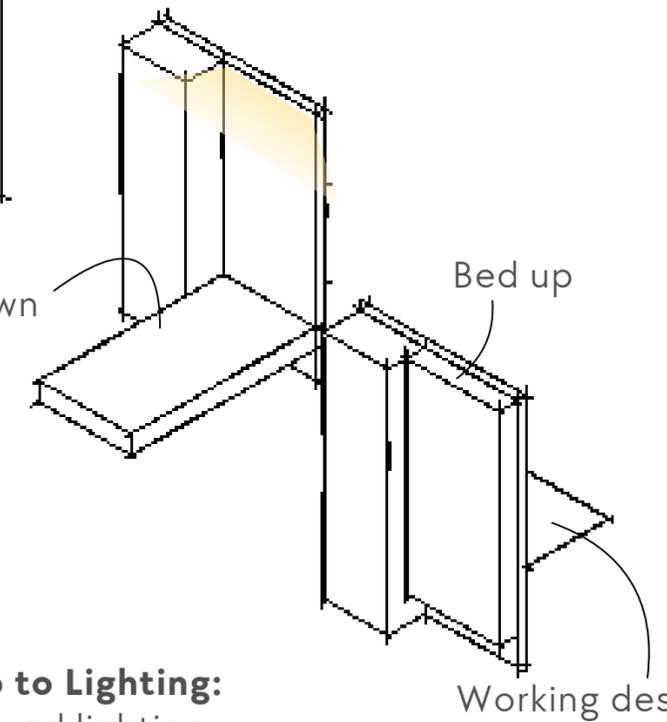
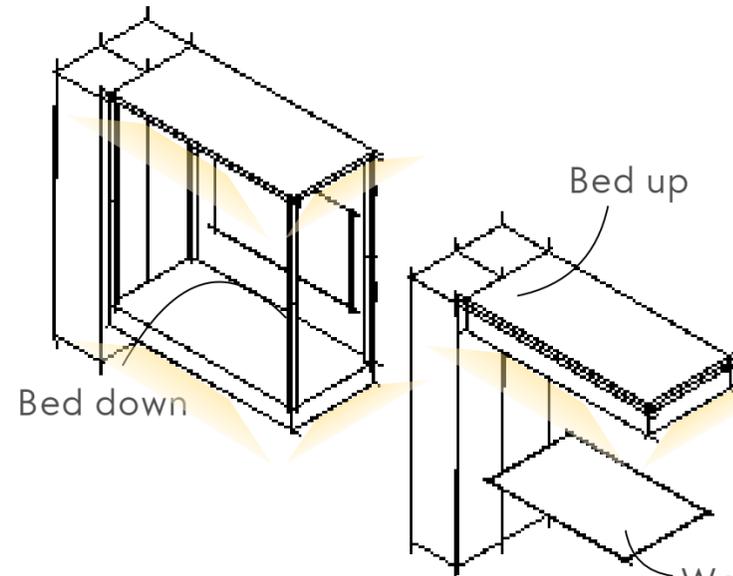
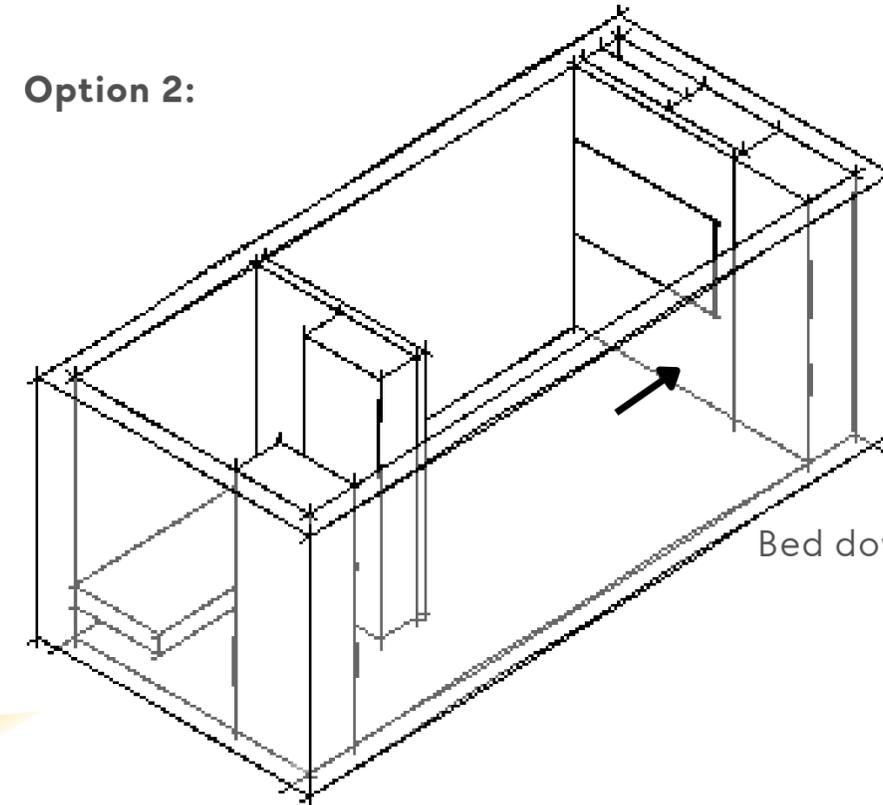
Option 2:



Option 1:



Option 2:



**Focus points:**

- This space can be closed off for privacy and that it can be made completely dark while sleeping
- The bed takes up a lot of space, while it's only really used at night, so it needs to be foldable.

**Option 1:**

Bed can be pushed up to the ceiling -> space underneath

**Option 2:**

sliding wall with a fold-out bed for private space

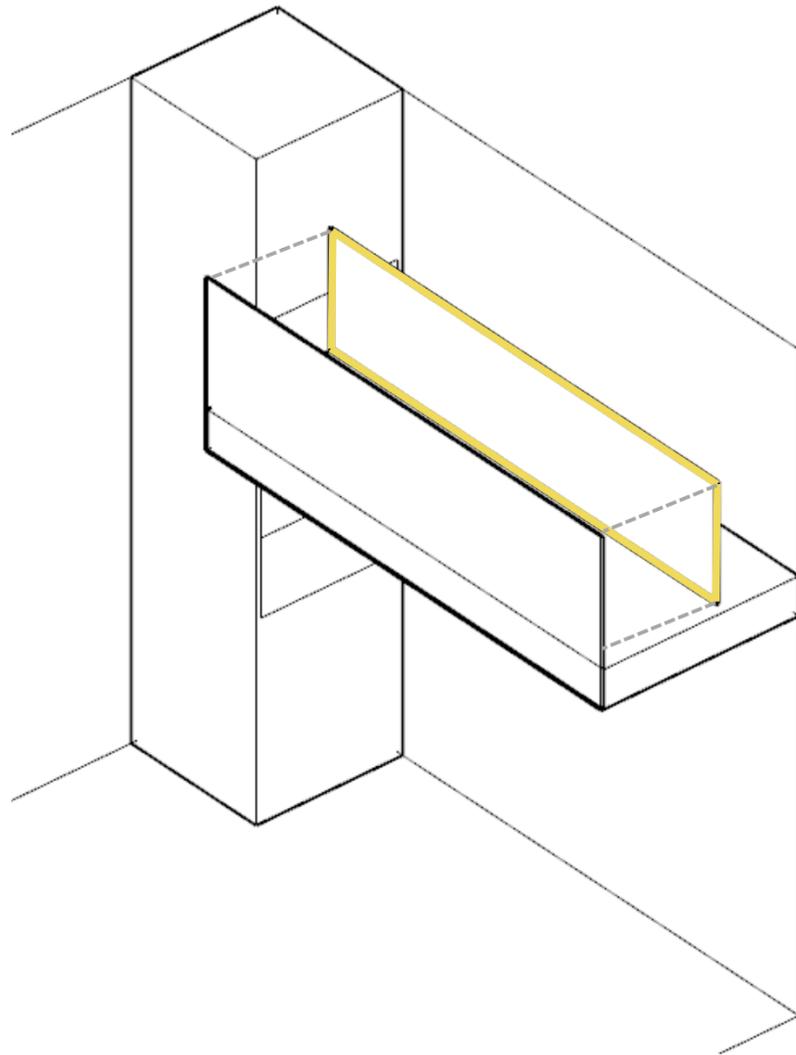
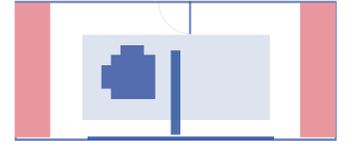
**Relationship to Lighting:**

- Personalized lighting
- sun-cycle lighting integrated in the ceiling

# O4 ADAPTIVE FURNISHING | WORKSTATION

## Integrated reconfigurable lighting system

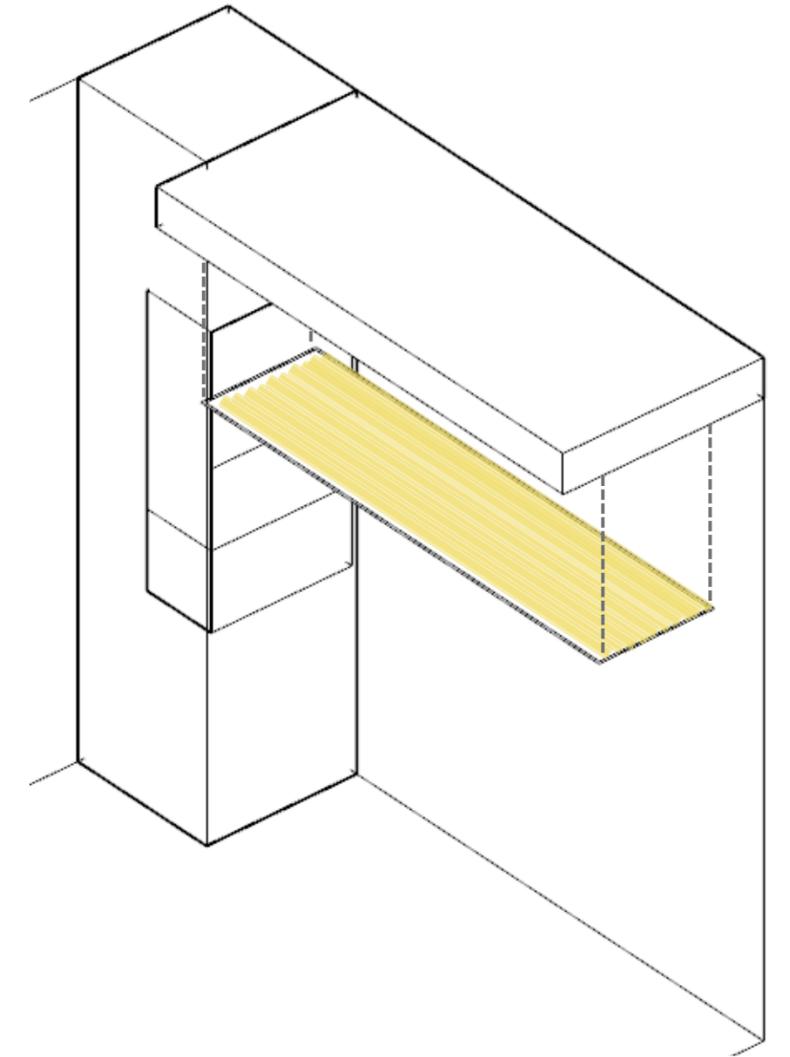
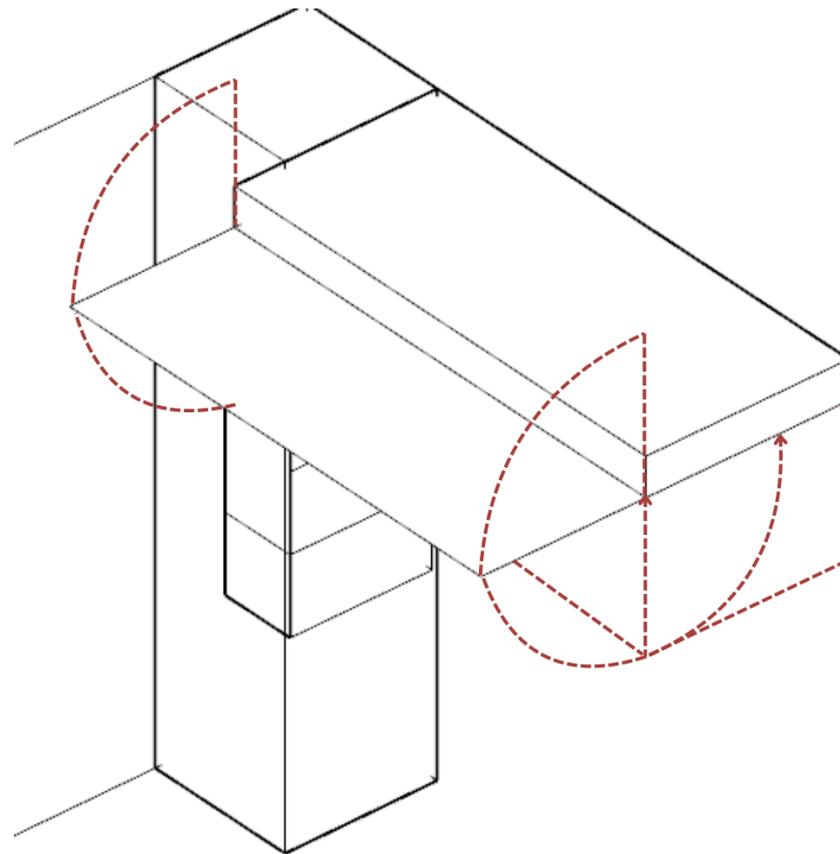
container key plan



### 1 - Perimeter glow integrated into bedframe

When the bed is in use, for the regulation of the circadian rhythm.

- Control system: CV



### 2 - Panel positioned vertically for desk illumination

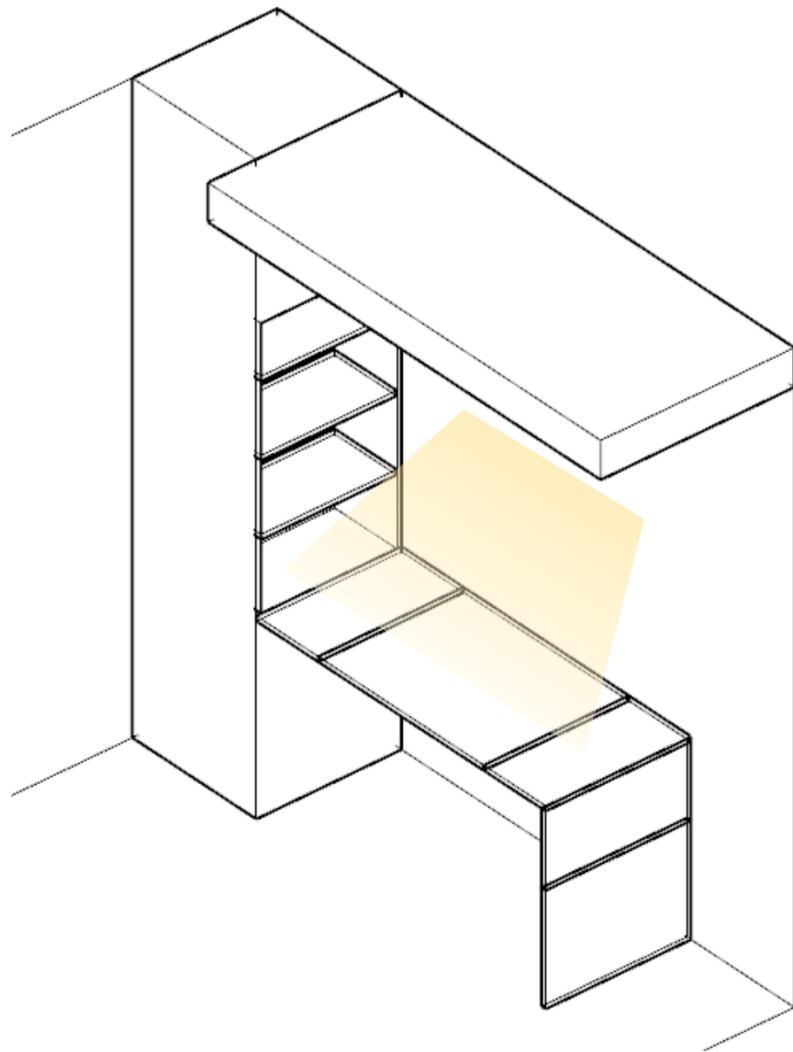
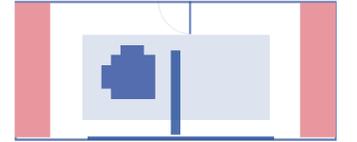
direct light above desk, hitting the desk vertically to avoid shadows cast from researcher body

- Control system: CV

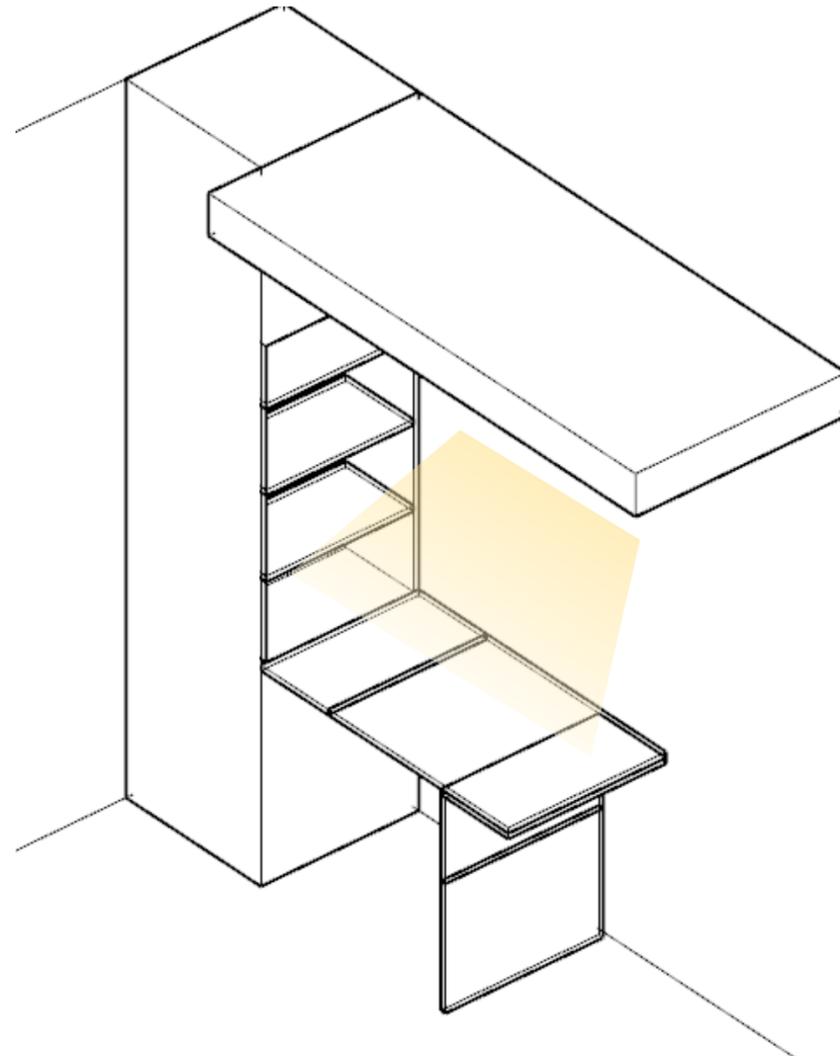
# 04 ADAPTIVE FURNISHING | WORKSTATION

Reconfigurable furniture system

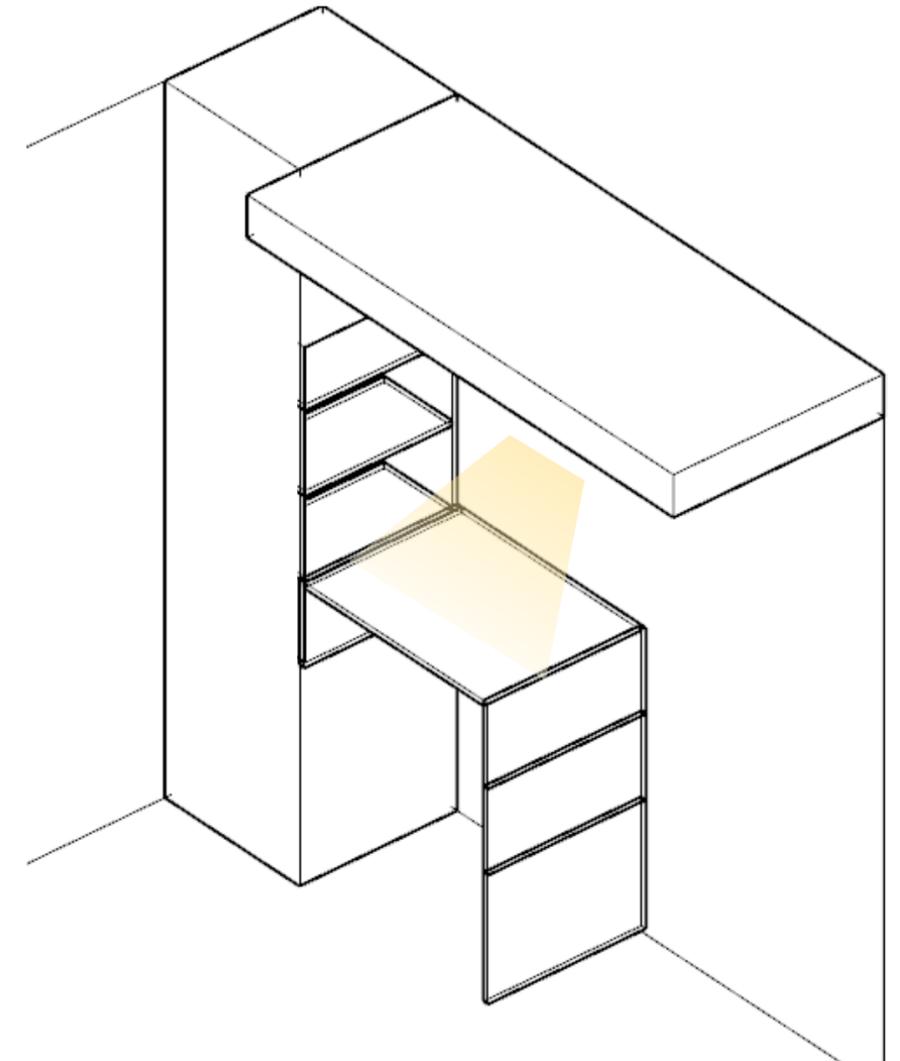
container key plan



1 - Workdesk for two people



2 - workdesk for one person

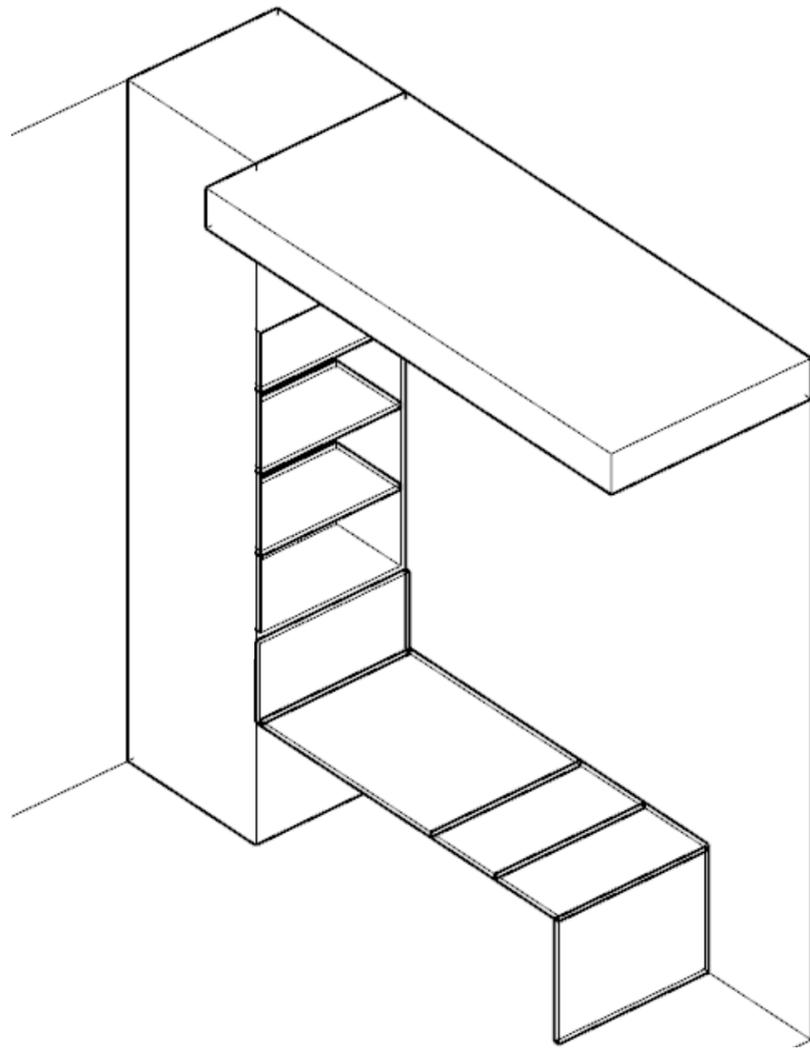
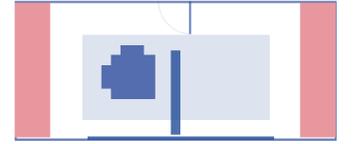


3 - standing desk

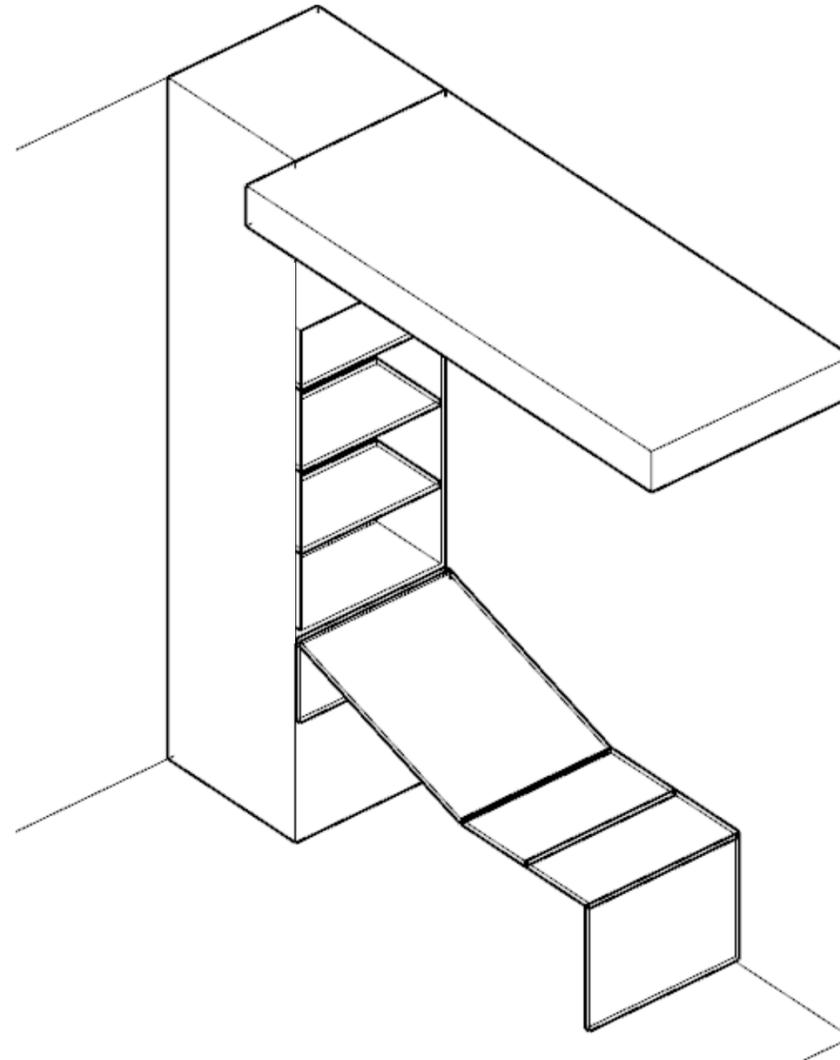
# O4 ADAPTIVE FURNISHING | WORKSTATION

Reconfigurable furniture system

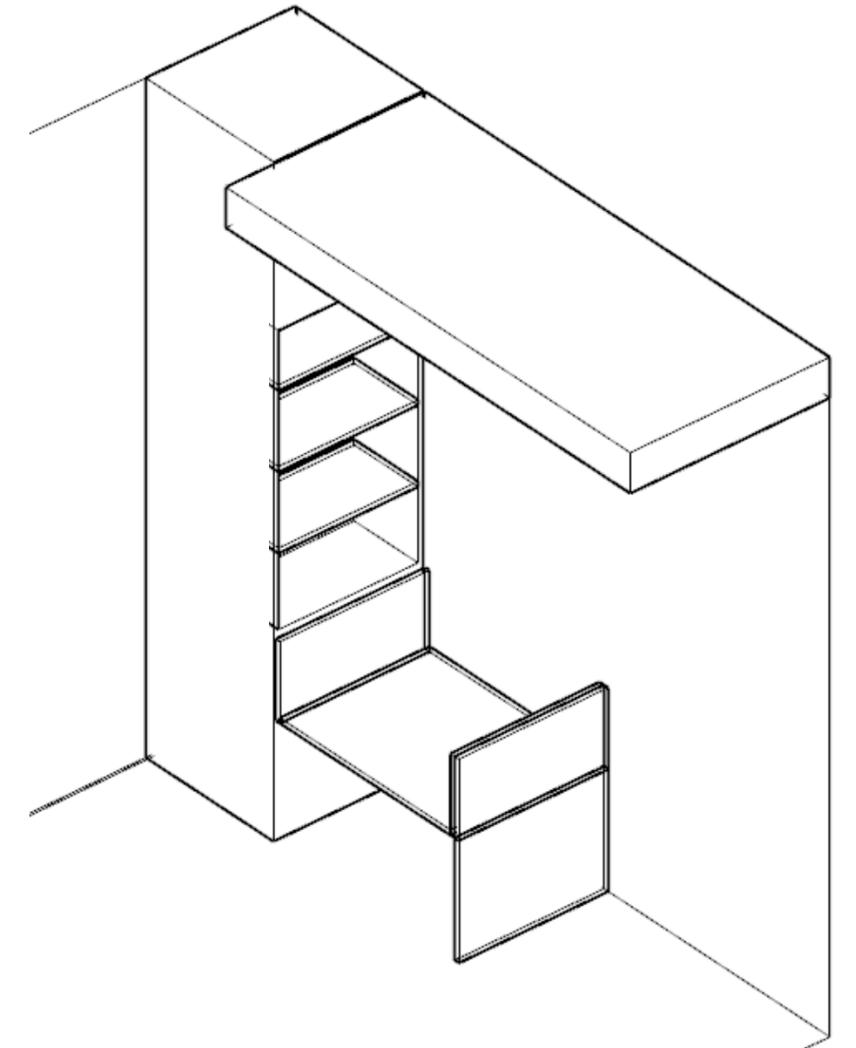
container key plan



4 - Reading bench



5 - lounge chair



6 - Armchair frame

# 05 ADAPTIVE FURNISHING | (LOUNGE) CHAIR

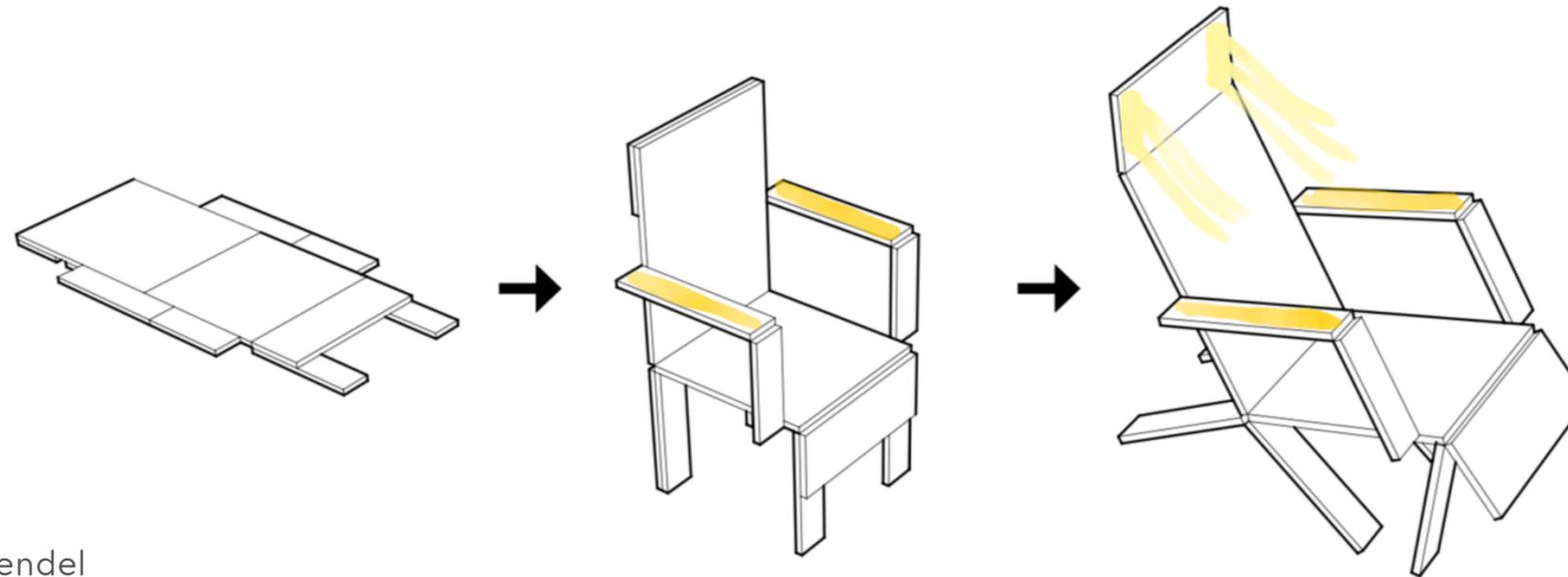
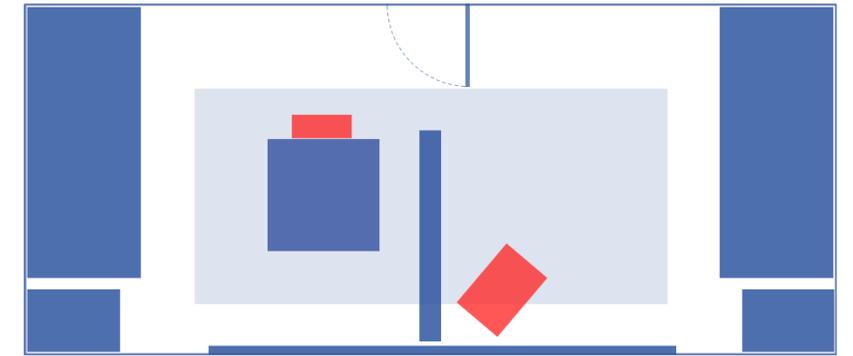
## Focuspoints

The chair can be used at the desk, the dining table and for lounging.

- It is not fixed on the wall but a moveable object.
- Can be folded flat

## Lighting

- Ambient light in the armrests, pressure sensors
- Focused reading light in the headrest for for example reading and other lounging activities, hinge sensor light



## Reference: Loop chair by Boaz Mendel

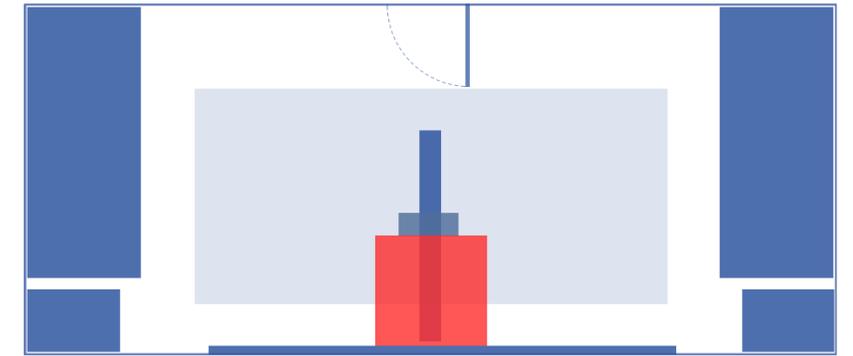
- a lot of different configurations possible, but it is not quickly changeable



# 06 ADAPTIVE FURNISHING | DINING TABLE

The table can be folded flat against the wall.

- the table can serve both as a dining table and as a workspace for two people.
- An integrated hinged light cell allows better light control according to the activity and time of day.
- Tabletop pivots downwards to rest on the table legs.



## Option 1:

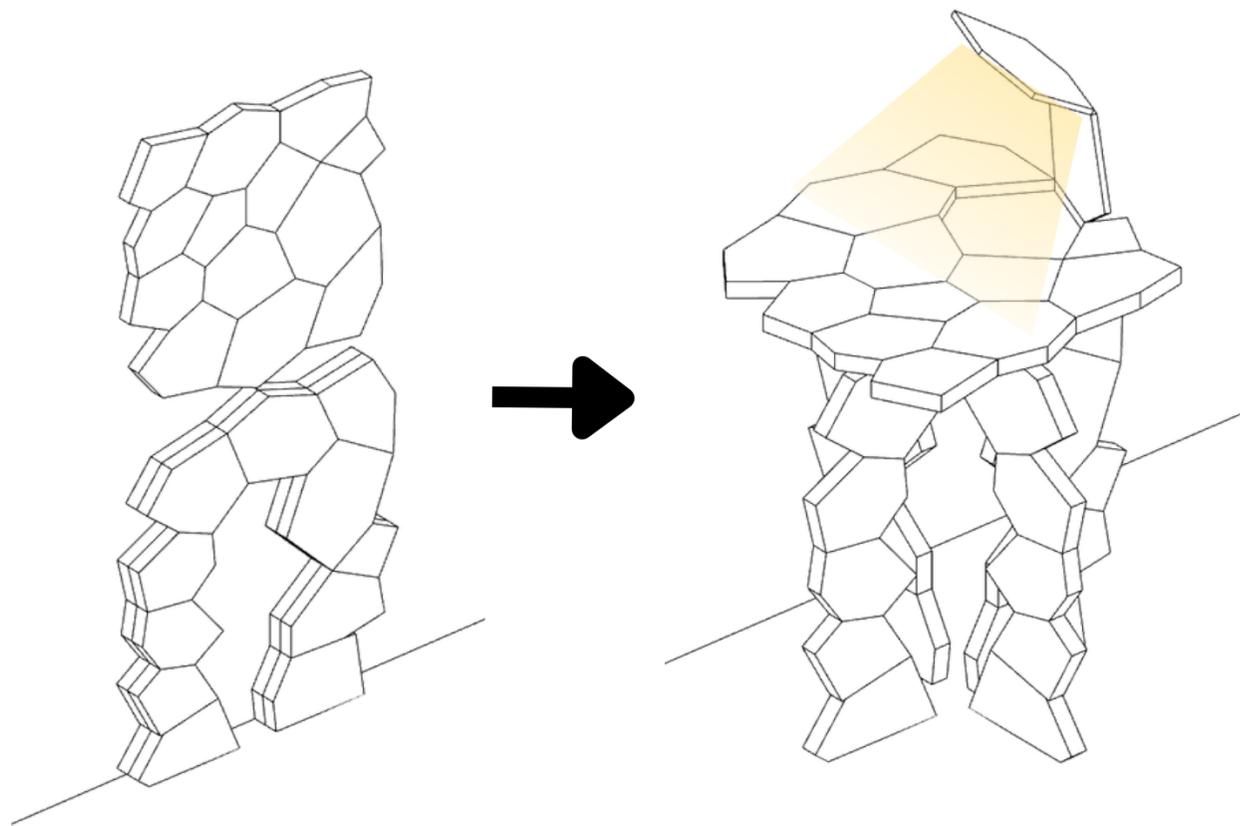


Table legs in the shape of an arch are joined by a hinge at their center at the top so that they can be unfolded perpendicular to each other.

## Option 2:

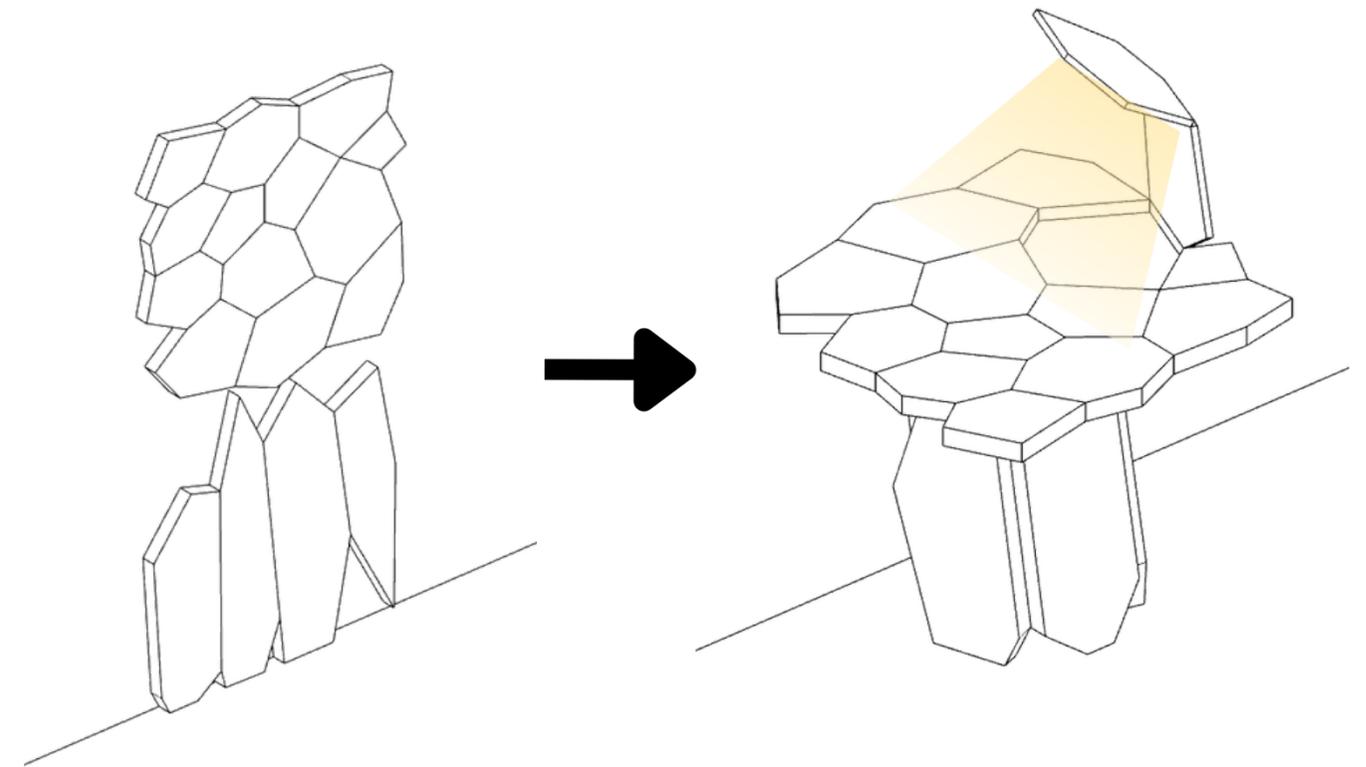


Table legs are flat against the wall and folded at their common edge to create a hollow single table leg in the middle.

# 07 ADAPTIVE FURNISHING | ROOM DIVIDER

The room divider has a foldable part so that it can be used at the same time as the dining table. When stored away, the room divider in closed position put flat against the wall and doesn't get in the way of the dining table.

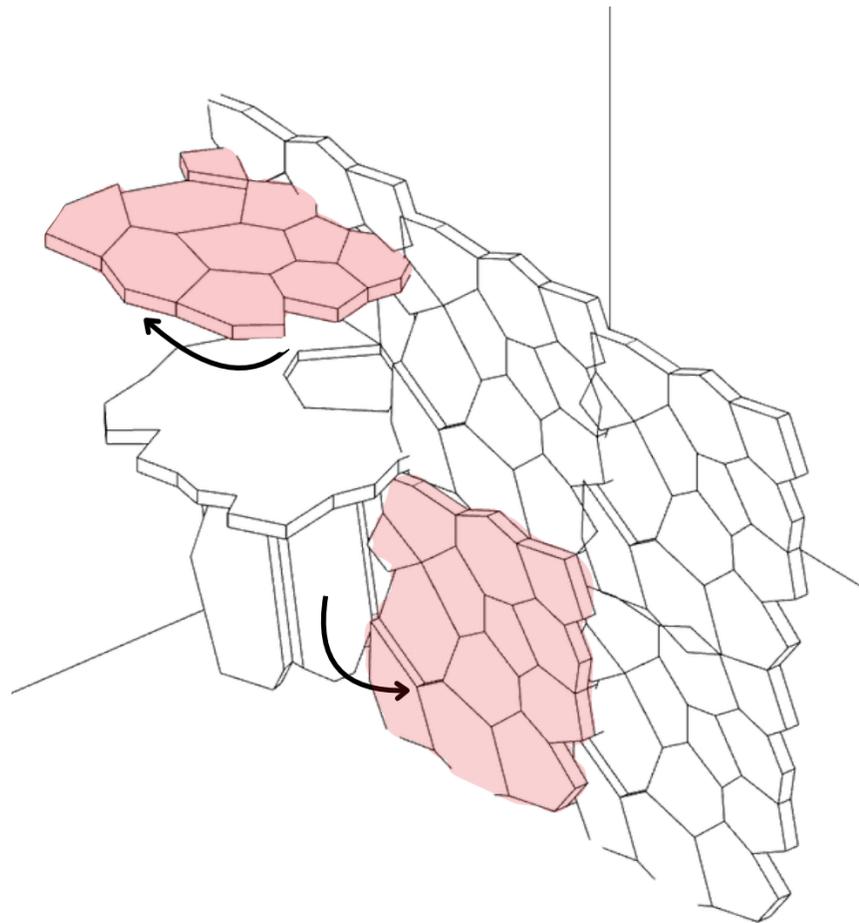
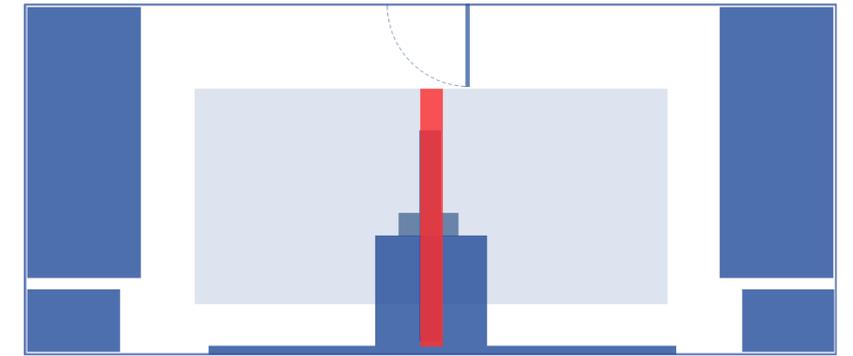


Table and room divider opened

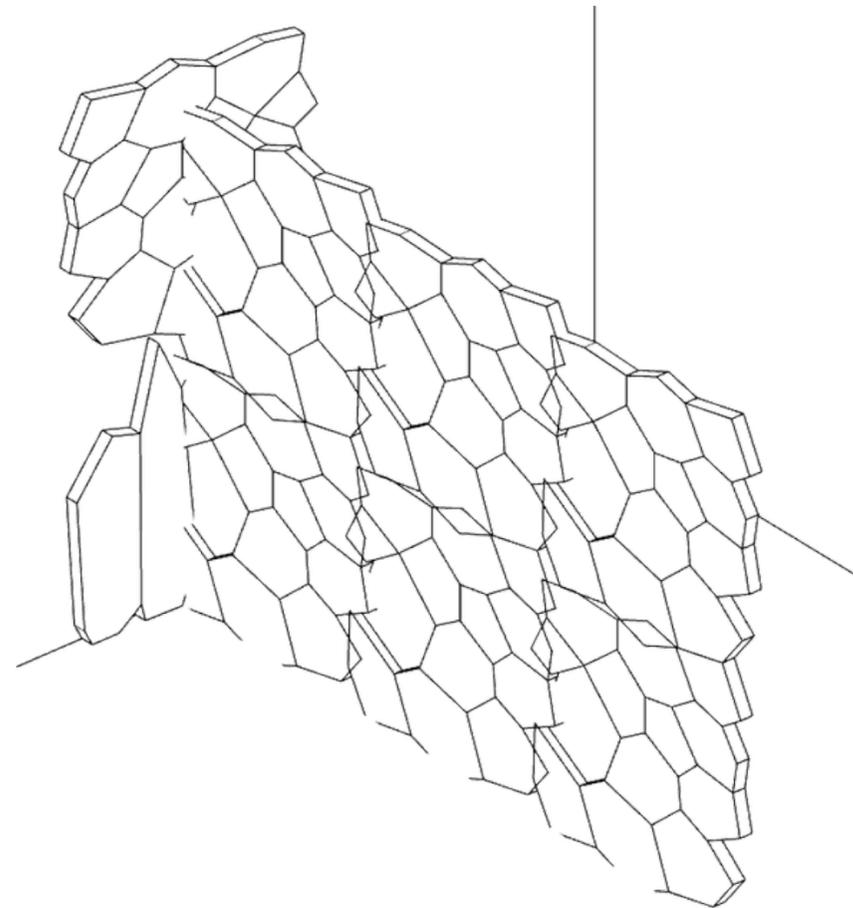


Table closed and room divider opened

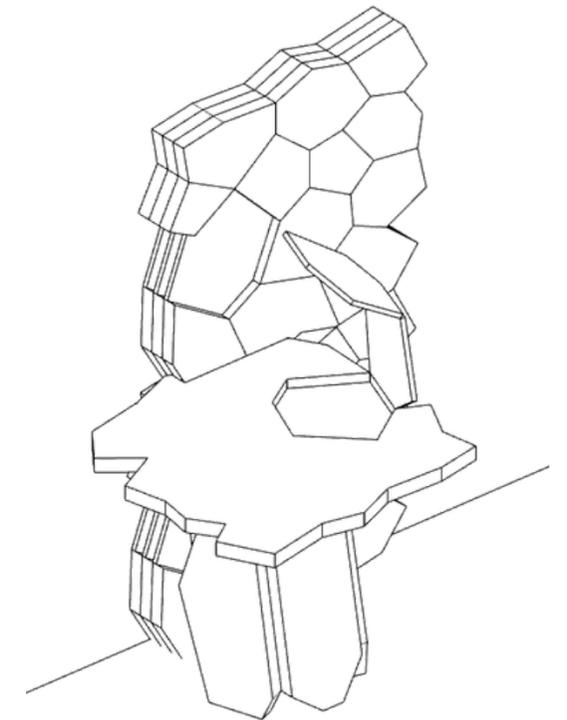


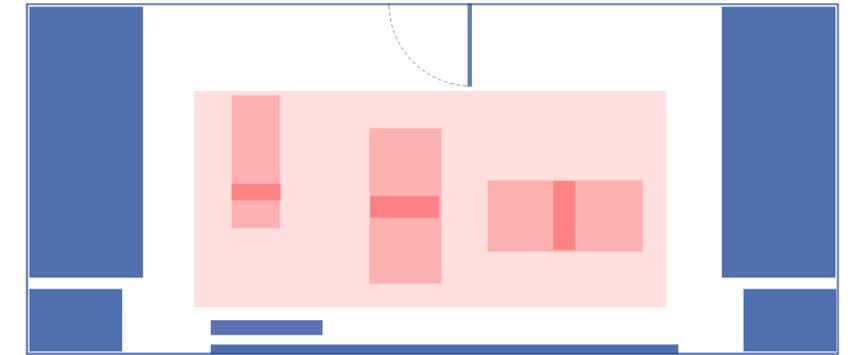
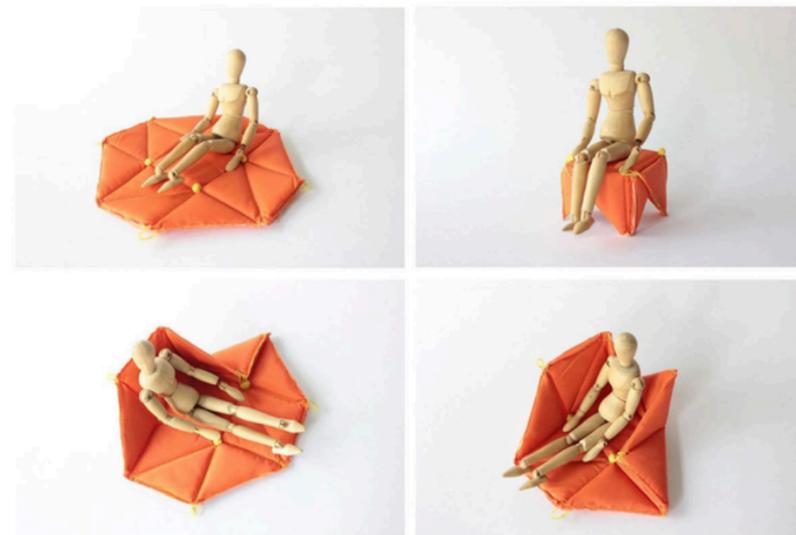
Table opened and room divider closed

# 08

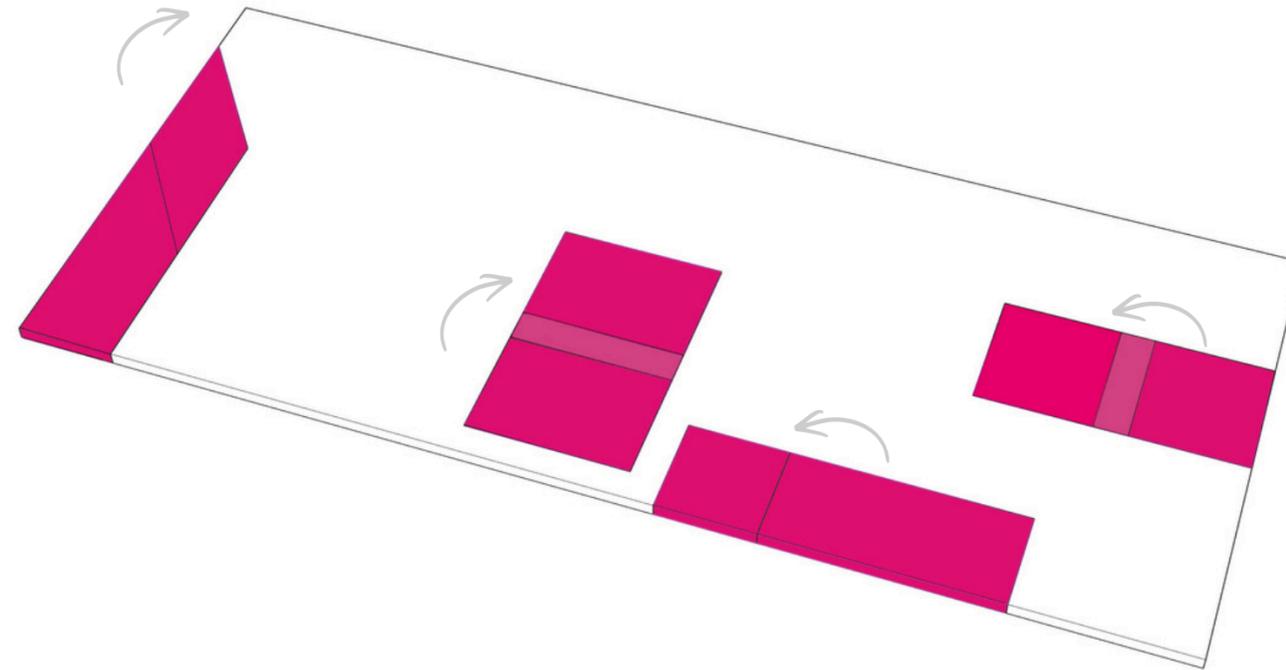
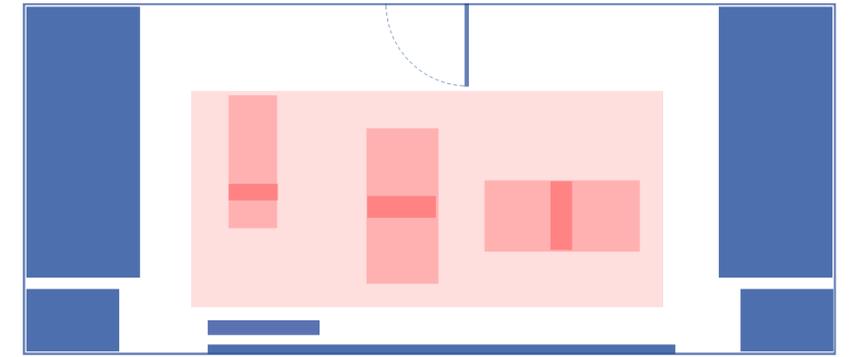
## ADAPTIVE FURNISHING | INTERACTIVE CARPET

### Advantages Interactive Carpet

- One surface, multiple functions
- Quick and intuitive reconfiguration
- Restores personal agency and confinement
- Supports mood and activity changes
- Reduces monotony and enhances wellbeing

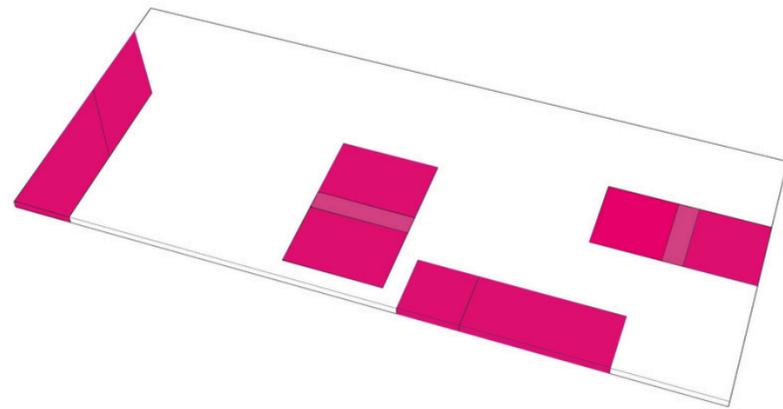


# 08 FURNITURE IDEA INTERACTIVE CARPET



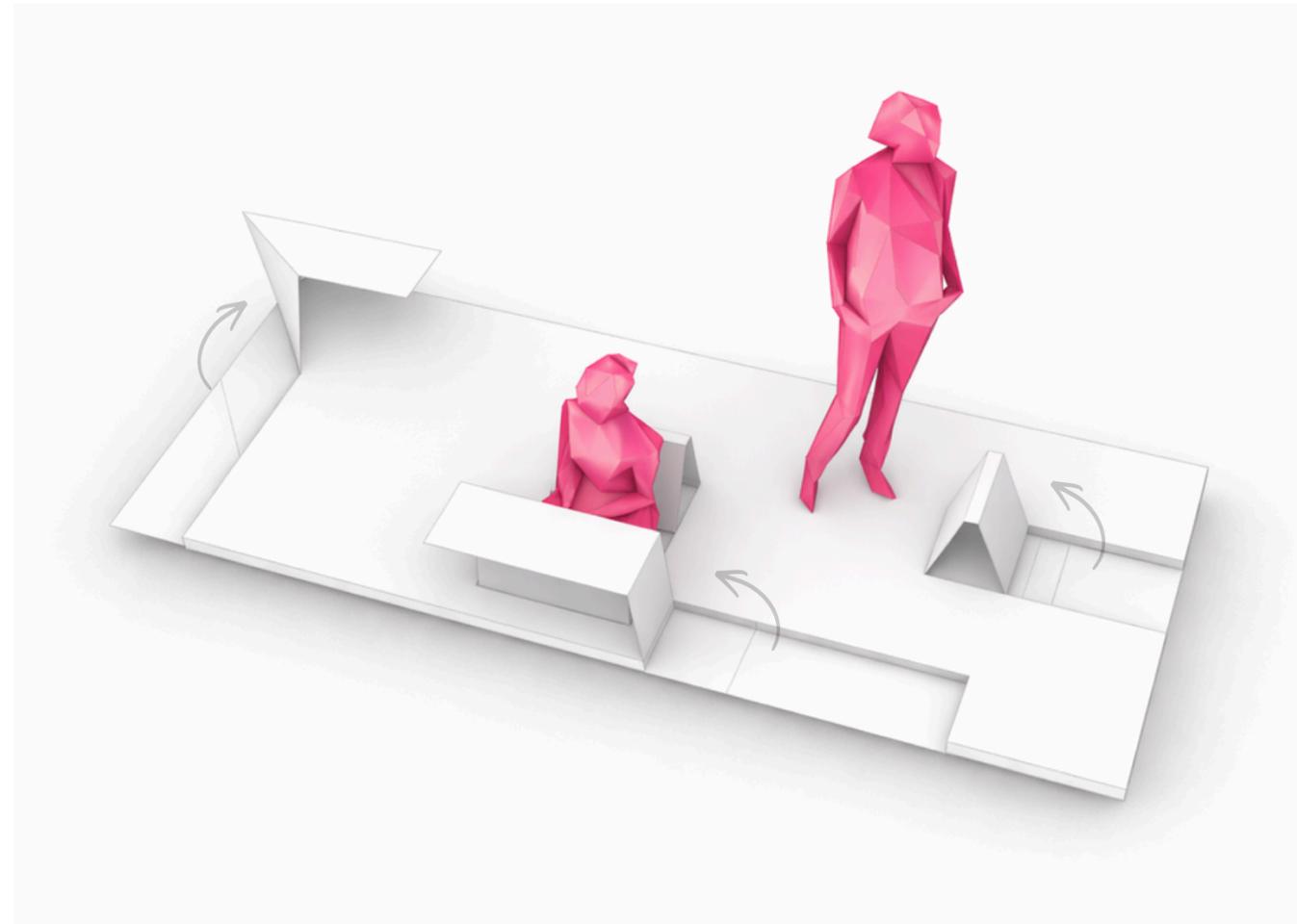
Foldable mat into variable relaxing/working configurations.

# 08 FURNITURE IDEA 'PEEL'



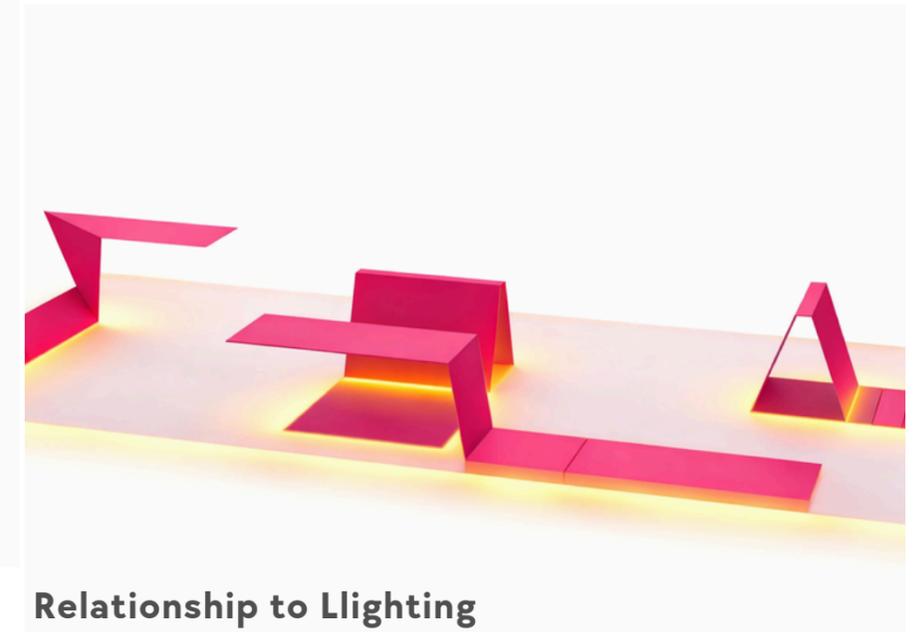
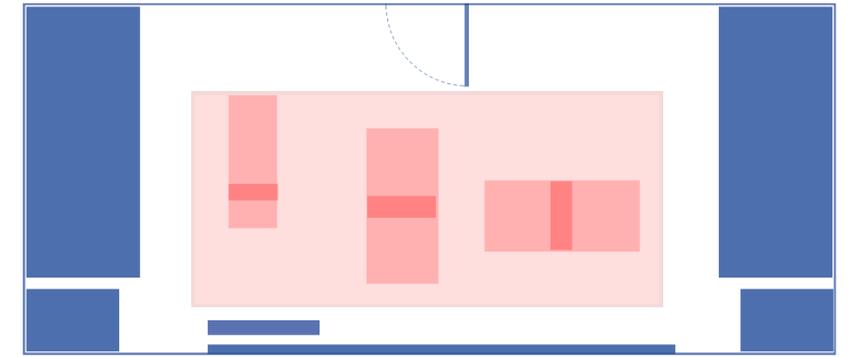
## 'Carpet' as Initial state

Initially this piece will be folded flat on the ground and serve as a carpet/division of space.



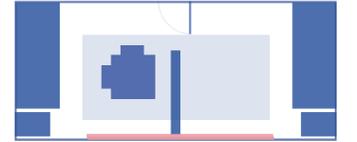
## Several Configurations

For a relaxed setting that can vary, depending on preference of a person or mood.

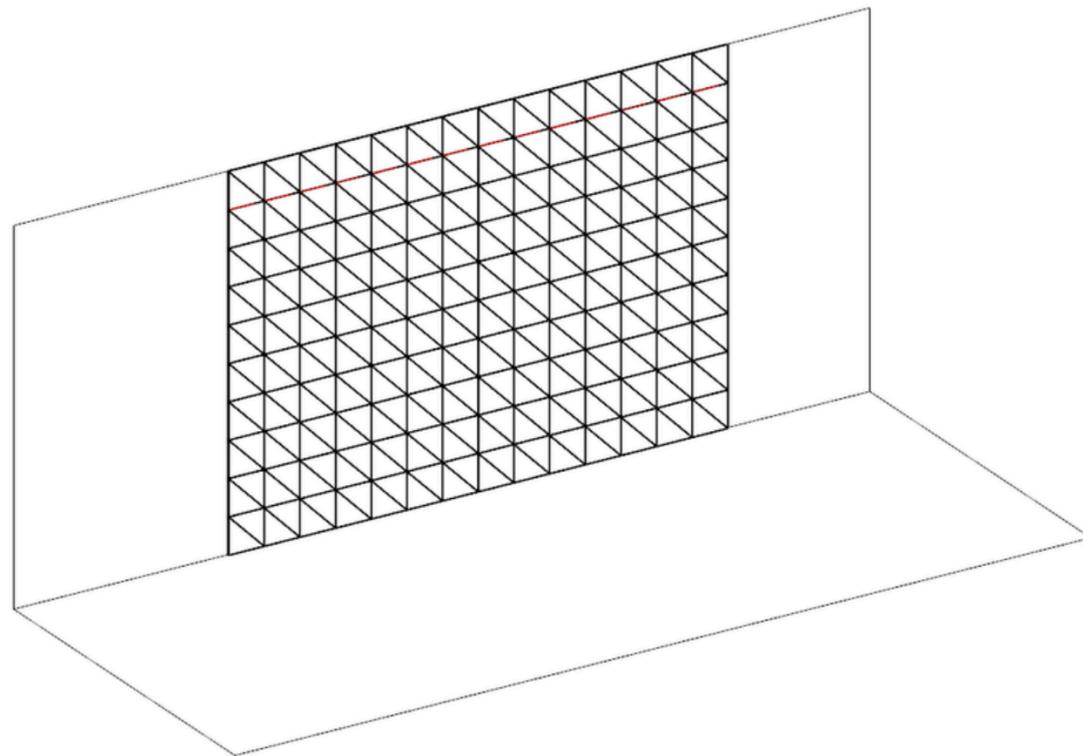


## Relationship to Lighting

LED light, diffused under the surfaces and activated when folded out.

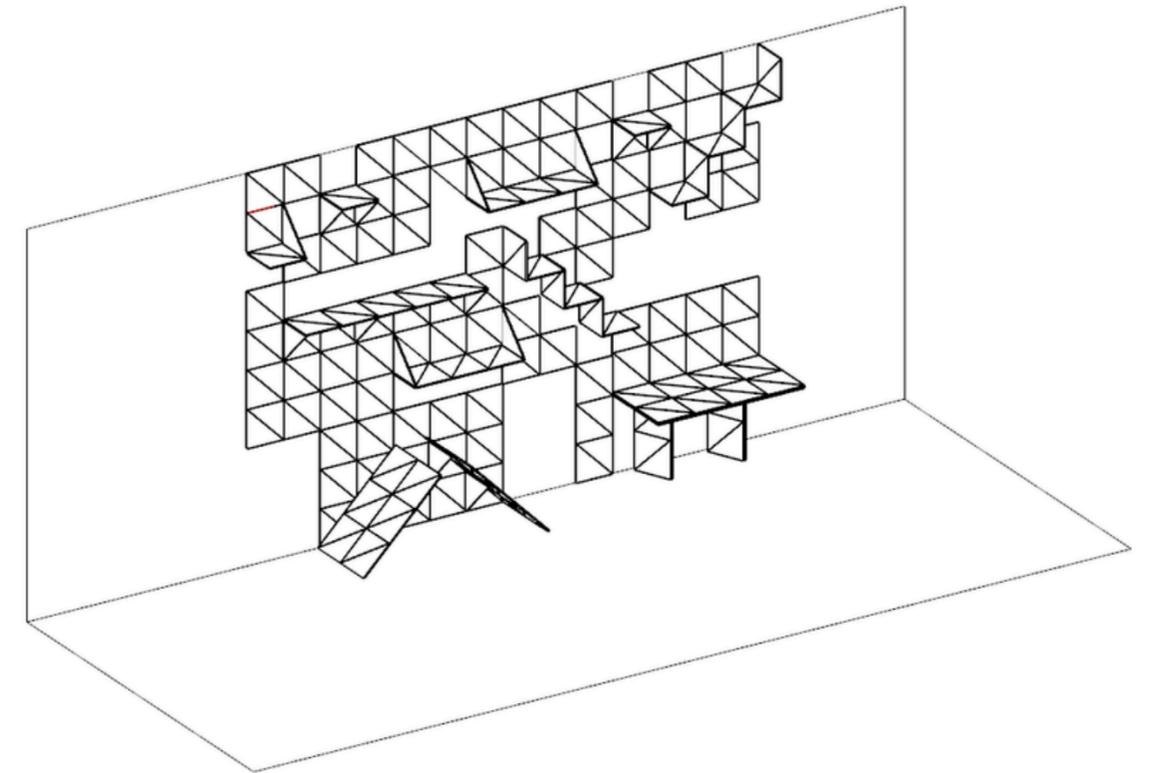


## References



### 1 - Folded modules

Triangular modules and can be completely folded up, for maximum space clearance

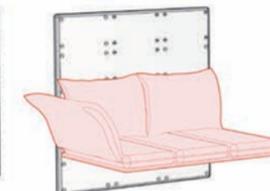
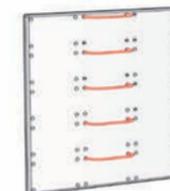
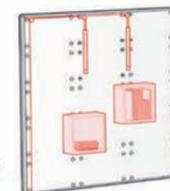
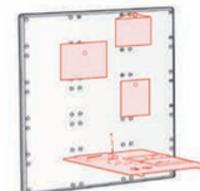
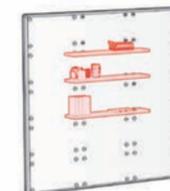


### 2 - Personalised wall

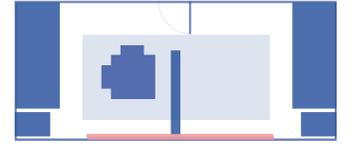
Modules create ambient lights, temporary shelves, seatings to fit the users necessities and taste.



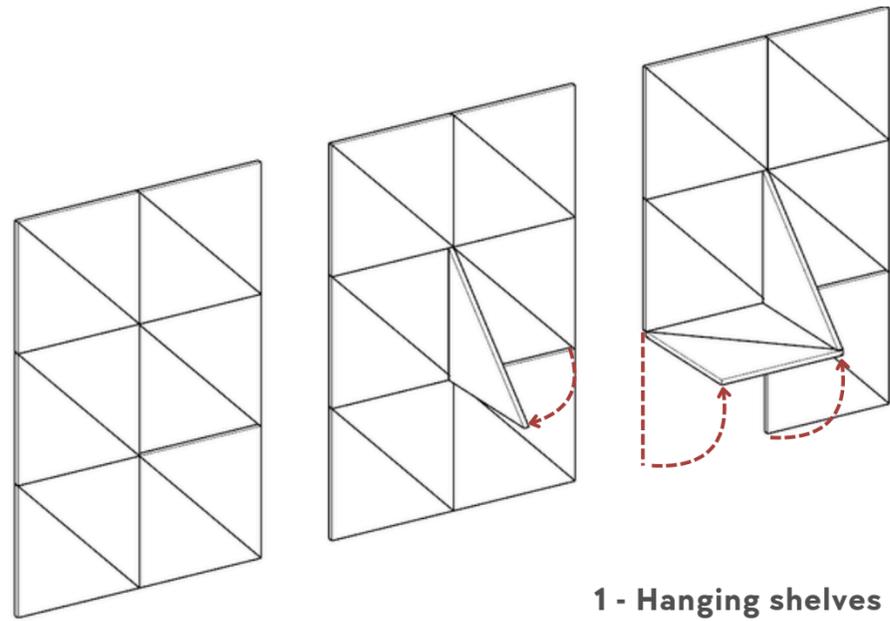
IKEA,  
Pegboard wall oraniser



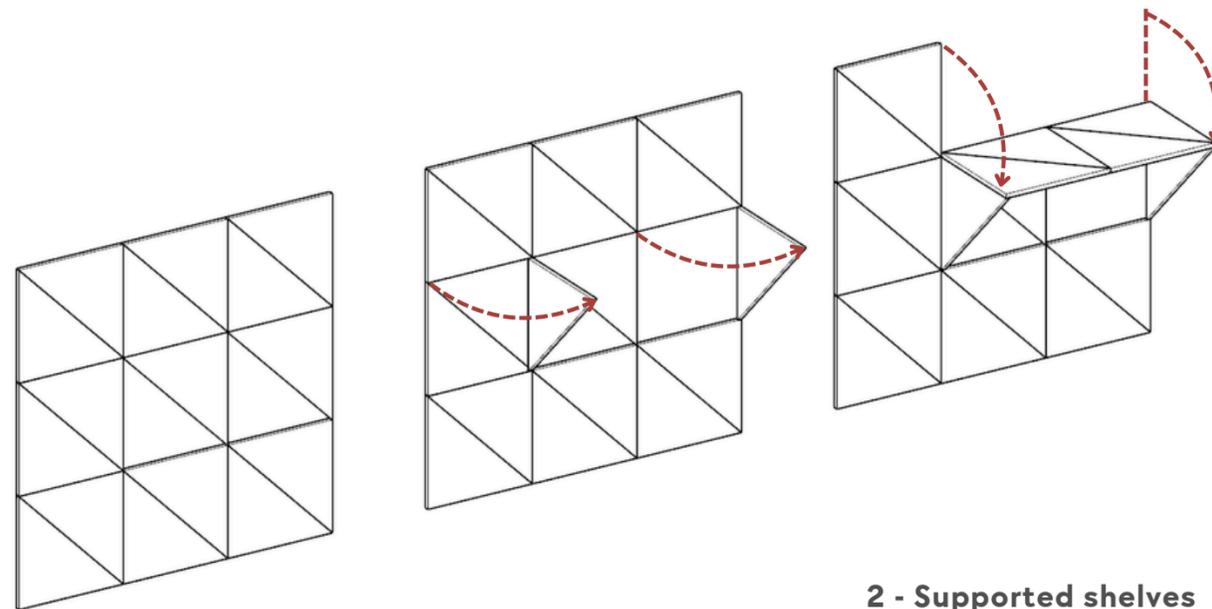
Hassell,  
Lunar Masterplan



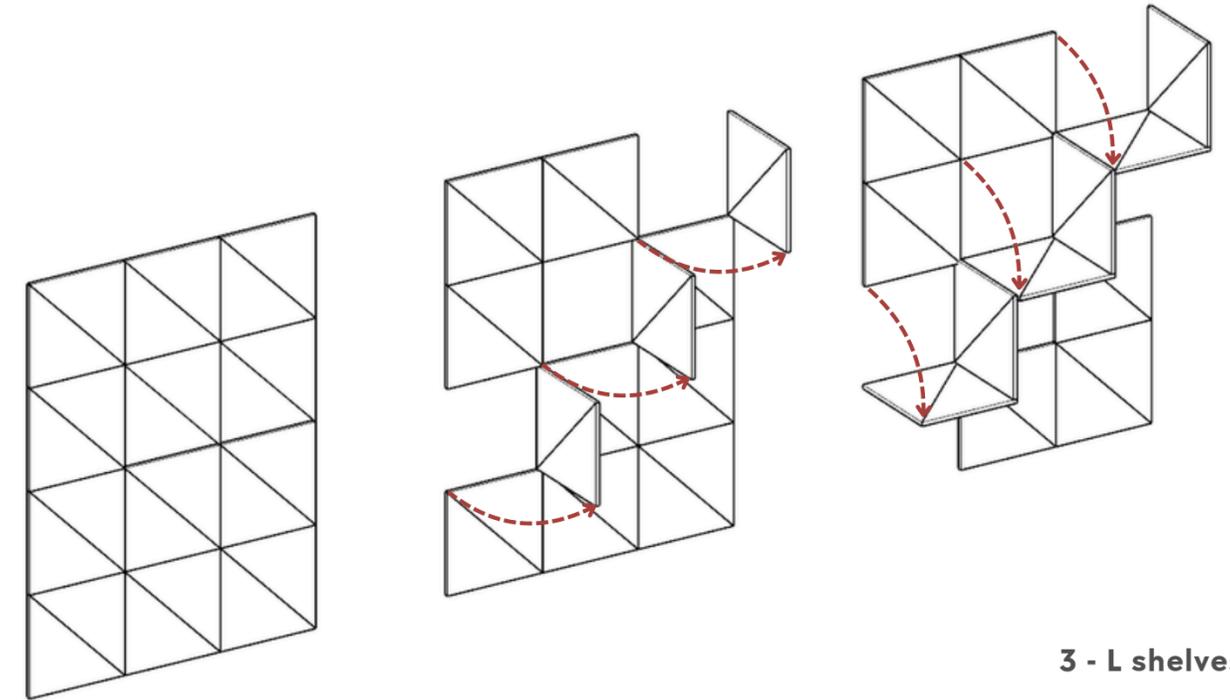
Shelves



1 - Hanging shelves



2 - Supported shelves

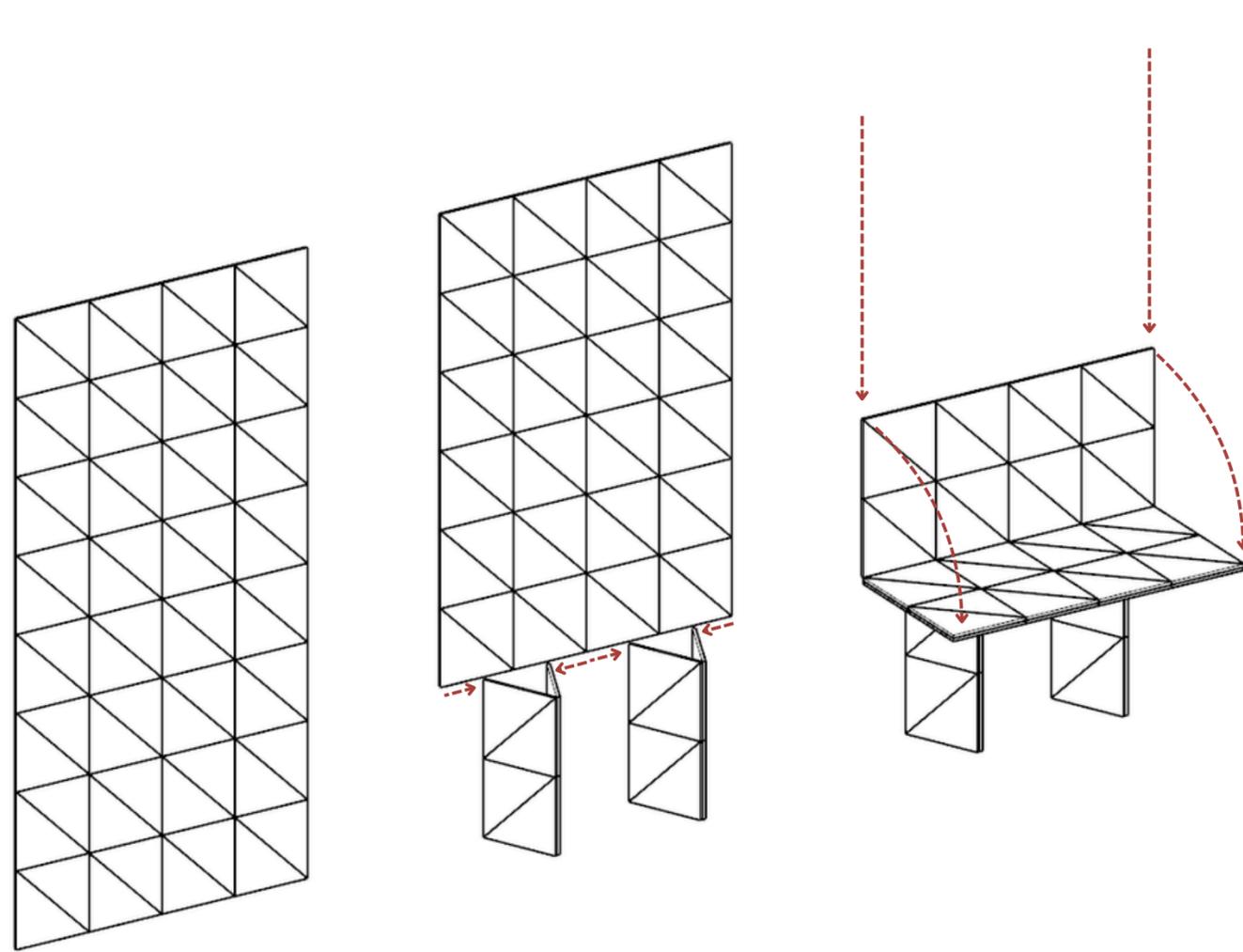


3 - L shelves

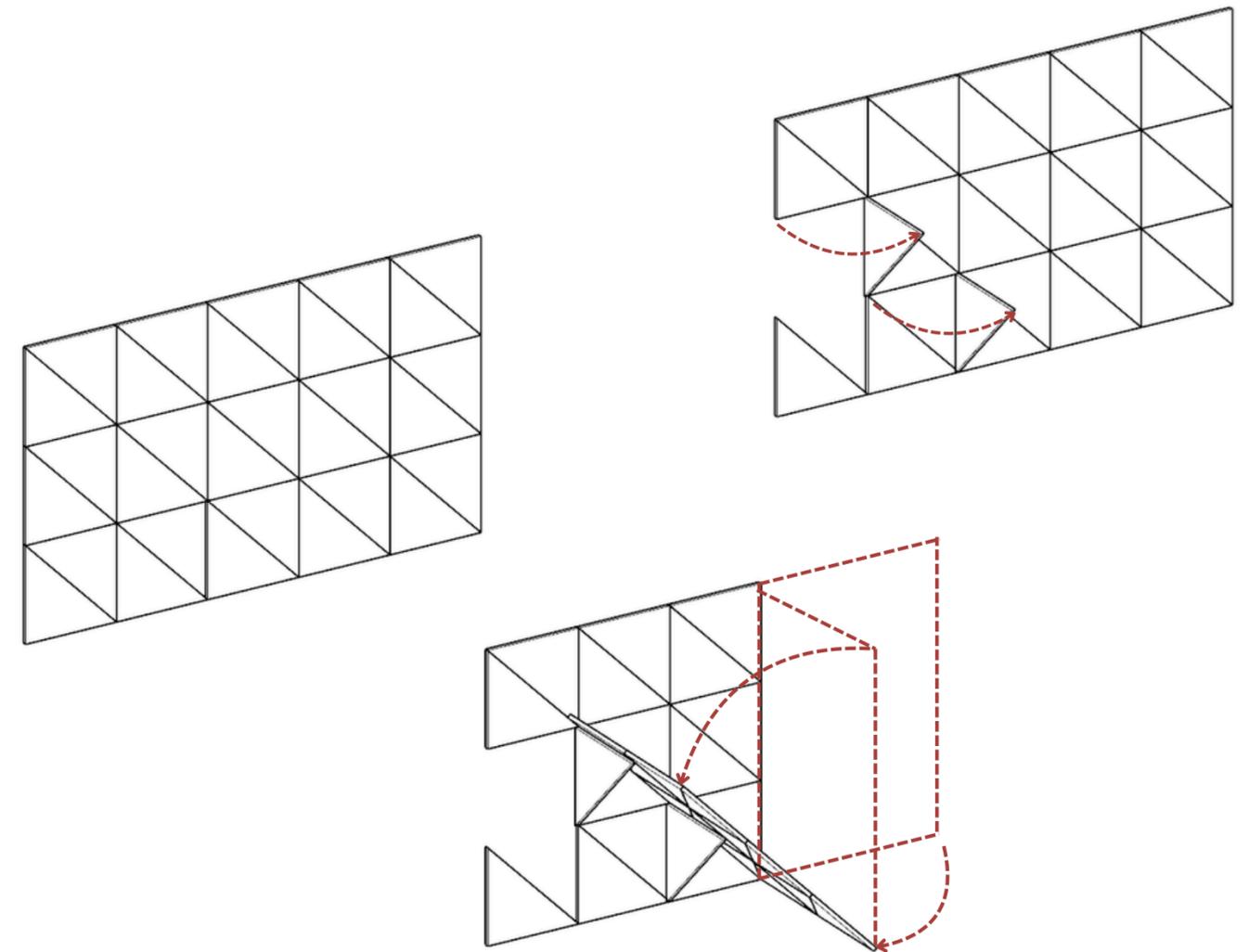
# 09 ADAPTIVE FURNISHING | MULTIPURPOSE WALL



## Temporary seatings



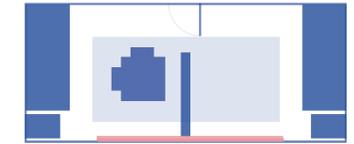
1 - Sofa



2 - Lounge chair

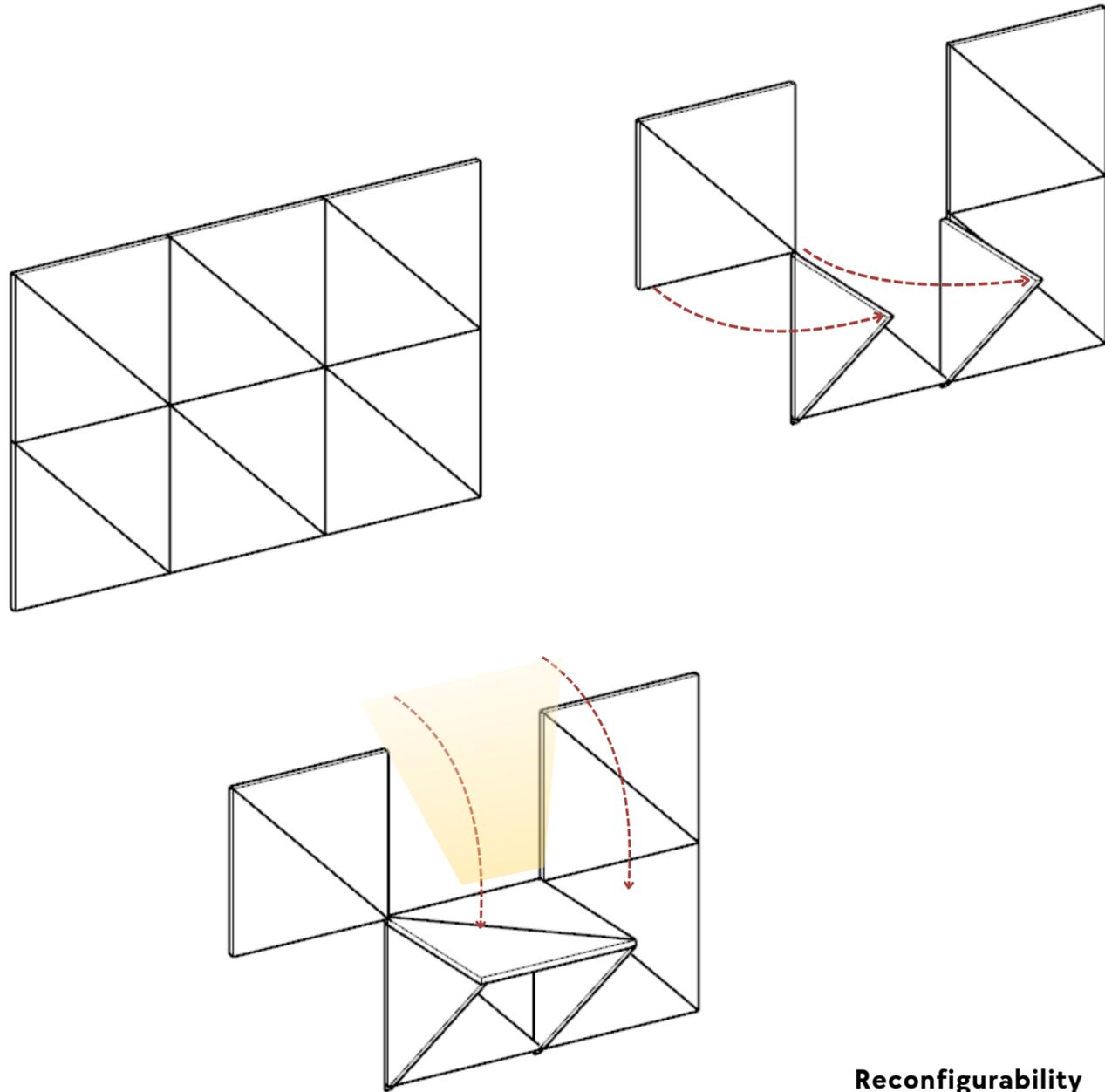
# 09

# ADAPTIVE FURNISHING | MULTIPURPOSE WALL

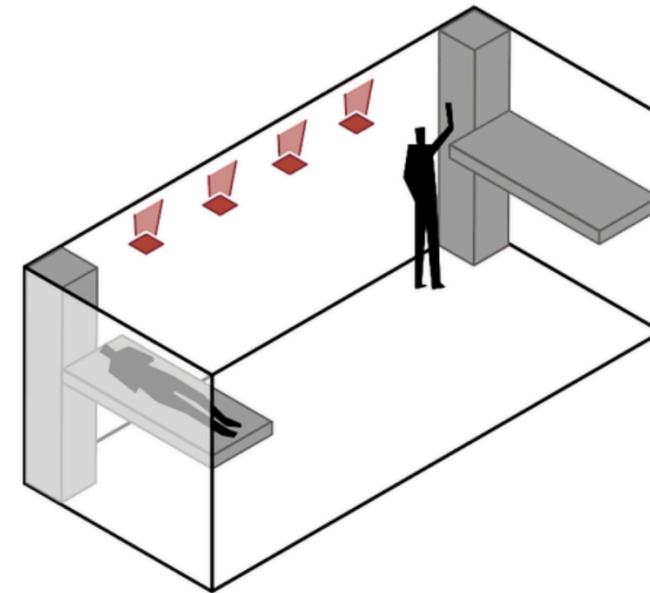


container key plan

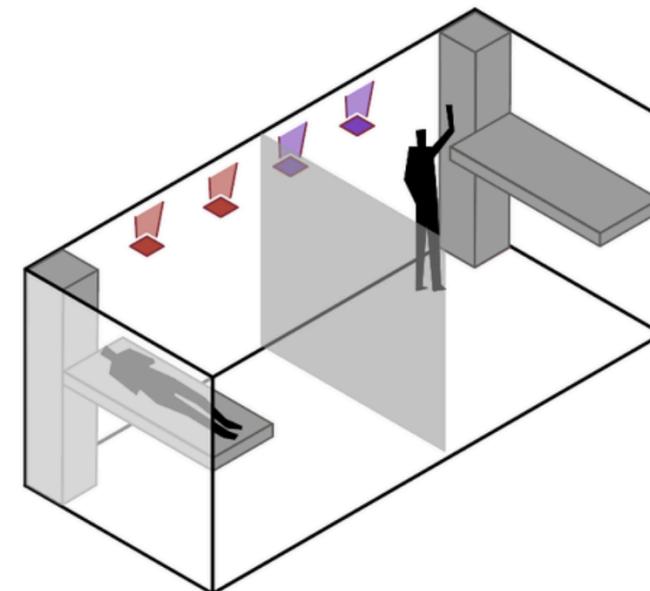
## Ambient lighting



Reconfigurability



**Common activities configuration**  
One ambient lighting system



**Private activities configuration**  
Two ambient lighting systems, working autonomously

**Control system**  
computer vision, image classification in "private activities configuration" and "common activities configuration"

Thank you for your attention !

