

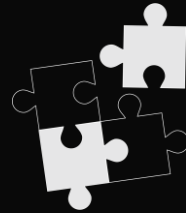
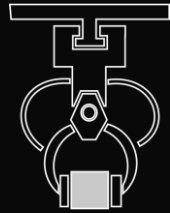
Master thesis presentation P5

Timmo de Haas – 4987314

02-07-21

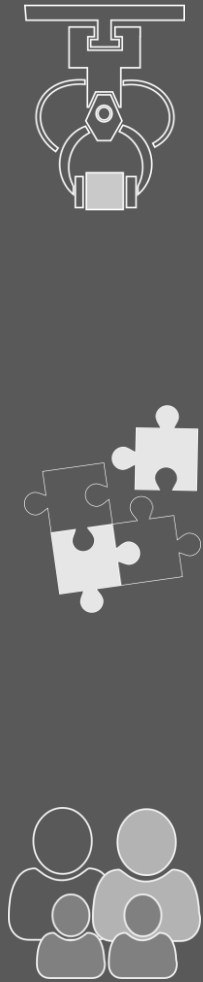
Research Conclusions	06
Design The infill	07
Design The parts	17
Design The case study	30
Design Conclusion	46
VR Exhibition	48

The research



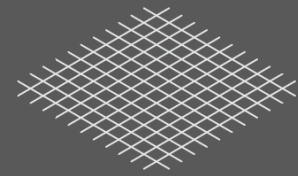
RESEARCH

1. Research
2. Design | The infill
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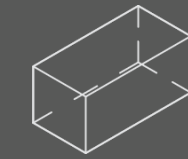


Design components

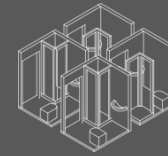
The infill system



Dimensional coordination System

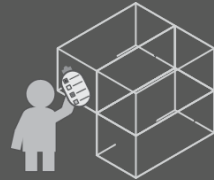


Volumetric unit

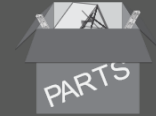


Catalog of modular pods

The open Building parts

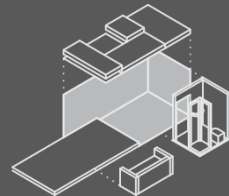


User interaction

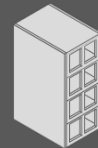


Kit of parts

Case study



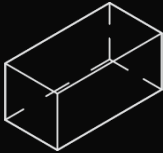
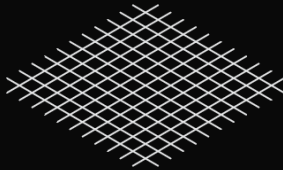
Example units



Existing building

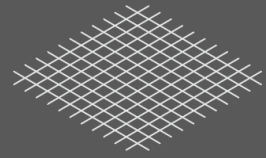
Design parts

The infill



THE INFILL SYSTEM | DESIGN

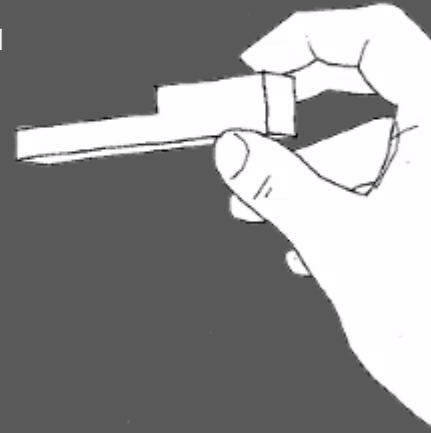
1. Research
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The Support



The infill

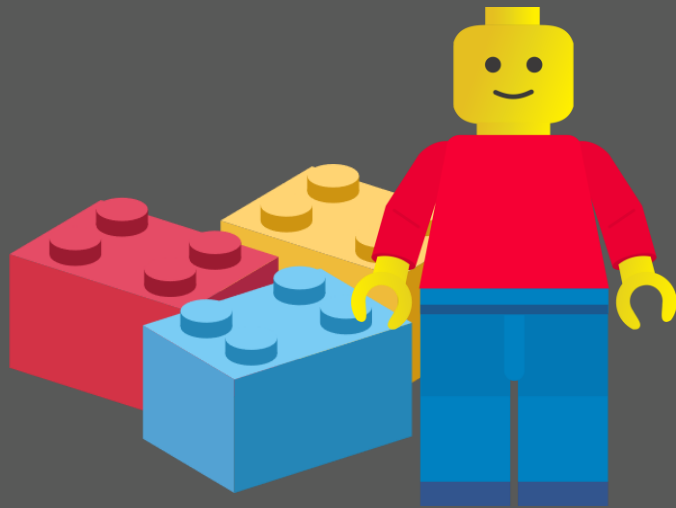


THE INFILL SYSTEM | DESIGN

1. Research
2. Design | The infill
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Dimensional coordination

- Create a system



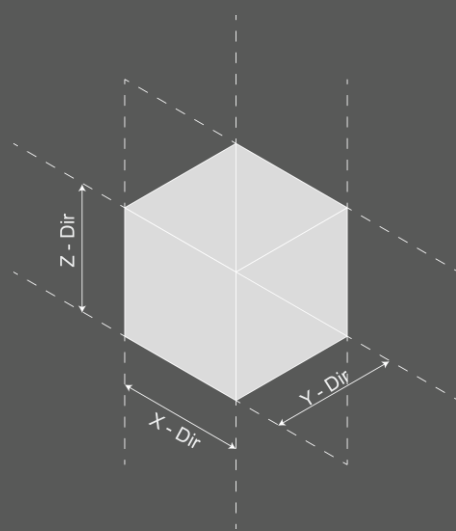
THE INFILL SYSTEM | DESIGN

1. Research
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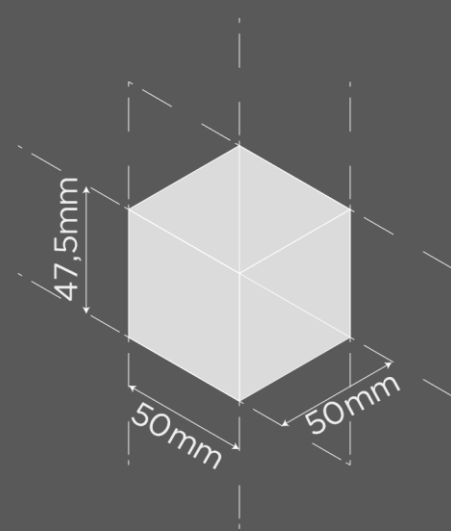
Dimensional coordination

- Based on the human measurements
- Of a dimensional coordination system the most important part is the module.

The module



The micro voxel

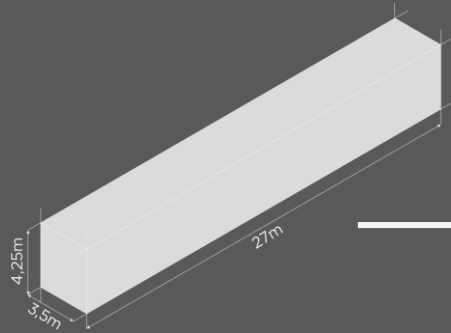


THE INFILL SYSTEM | DESIGN

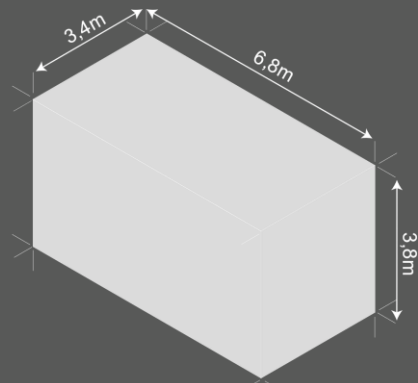
1. Research
2. Design | The infill
3. Design | The parts
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The open building unit

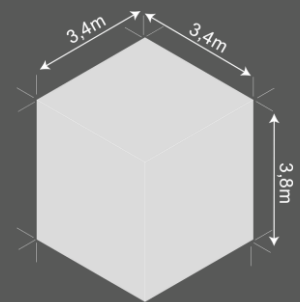
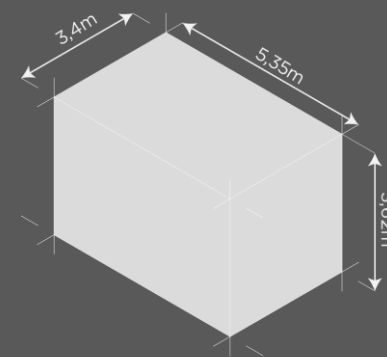
The maximum



Two mezo voxels:
The unit



The minimum



The open building concept: the
mezo voxel

THE INFILL SYSTEM | DESIGN

Catalog of elements

- A element is a prefabricated room/ component
- Requirements:
 - o Abide by the dimensional system
 - o High accuracy, low precision



Low accuracy
Low precision



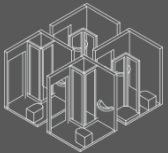
Low accuracy
High precision



High accuracy
Low precision



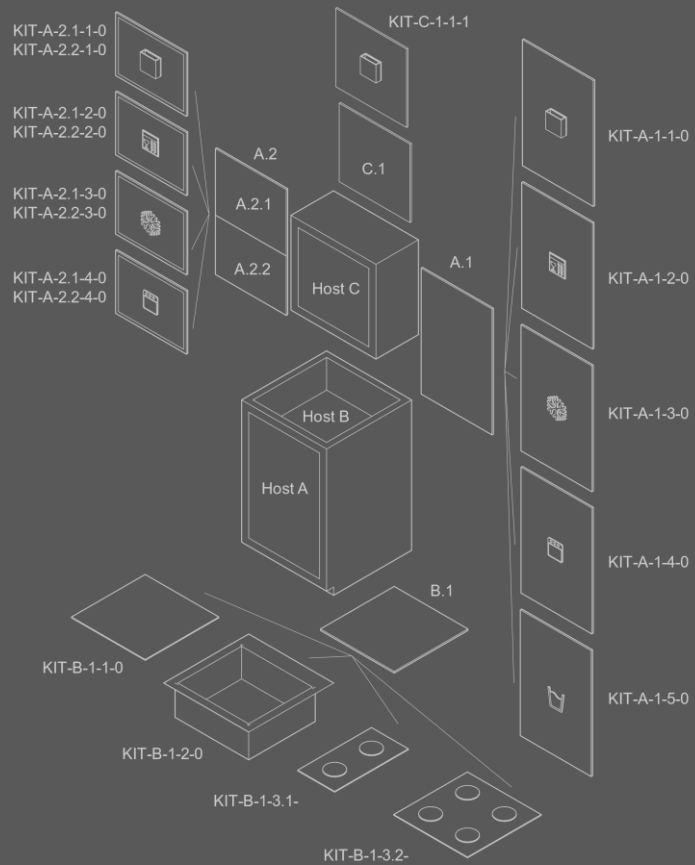
High accuracy
High precision



THE INFILL SYSTEM | DESIGN

1. Research
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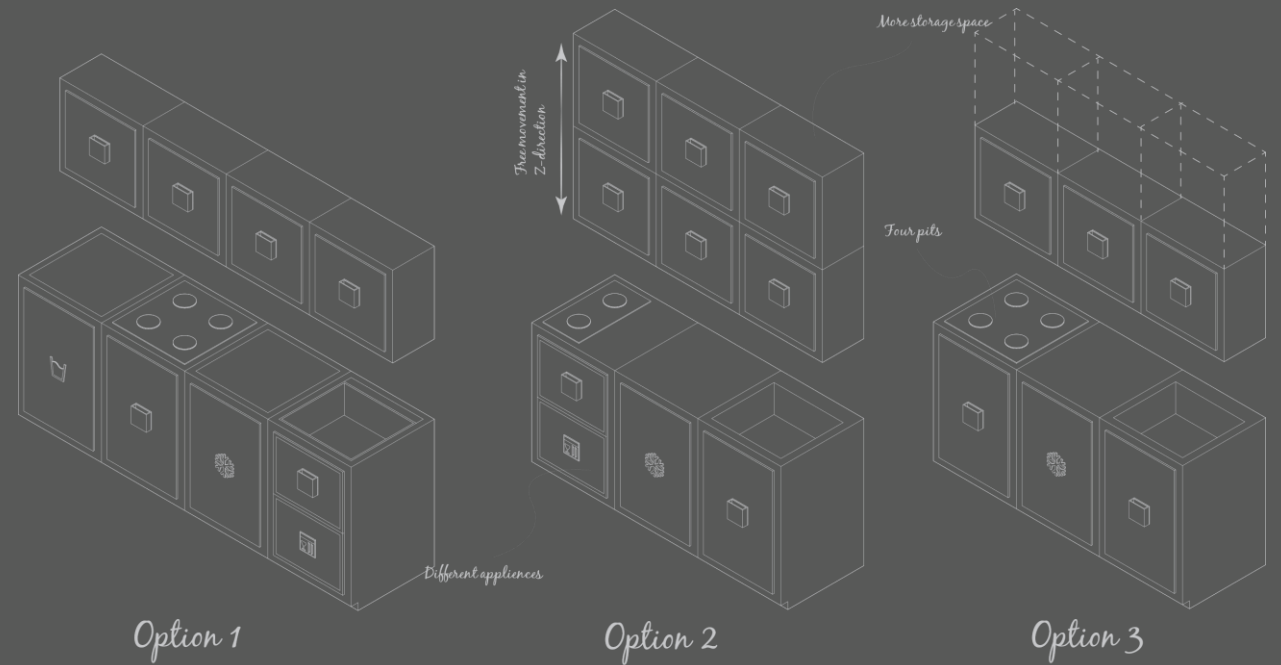
Catalog of pods - Kitchen



Legend



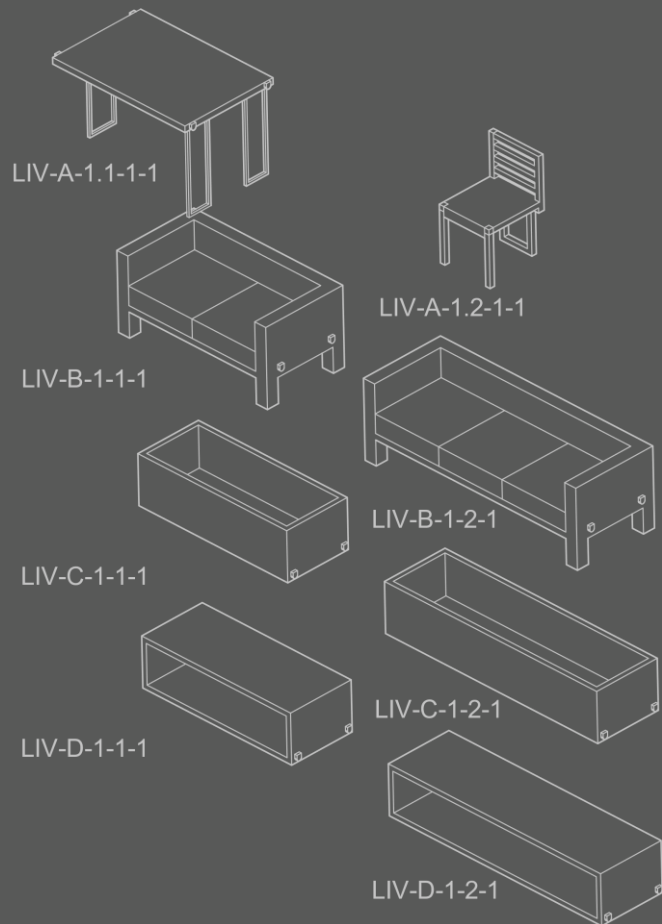
Possible configurations



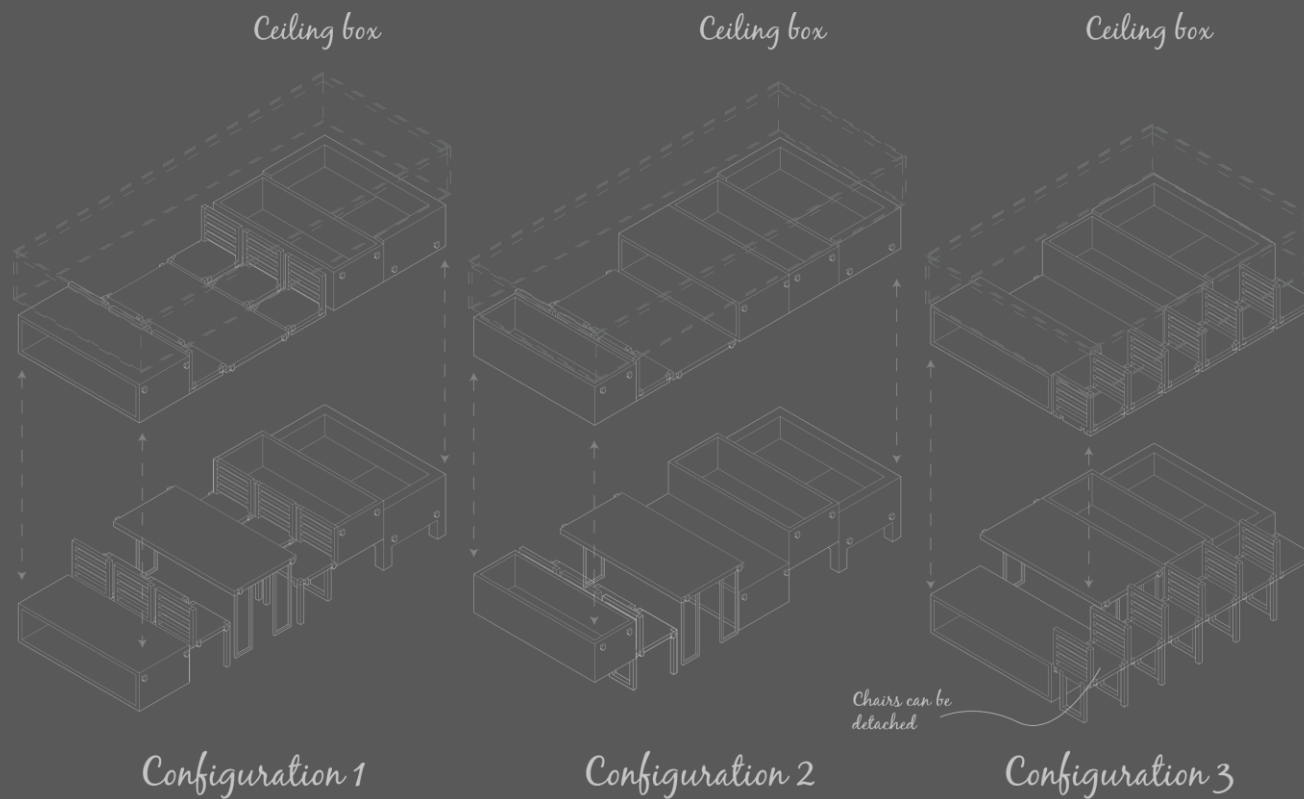
THE INFILL SYSTEM | DESIGN

1. Research
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Catalog of pods - living room



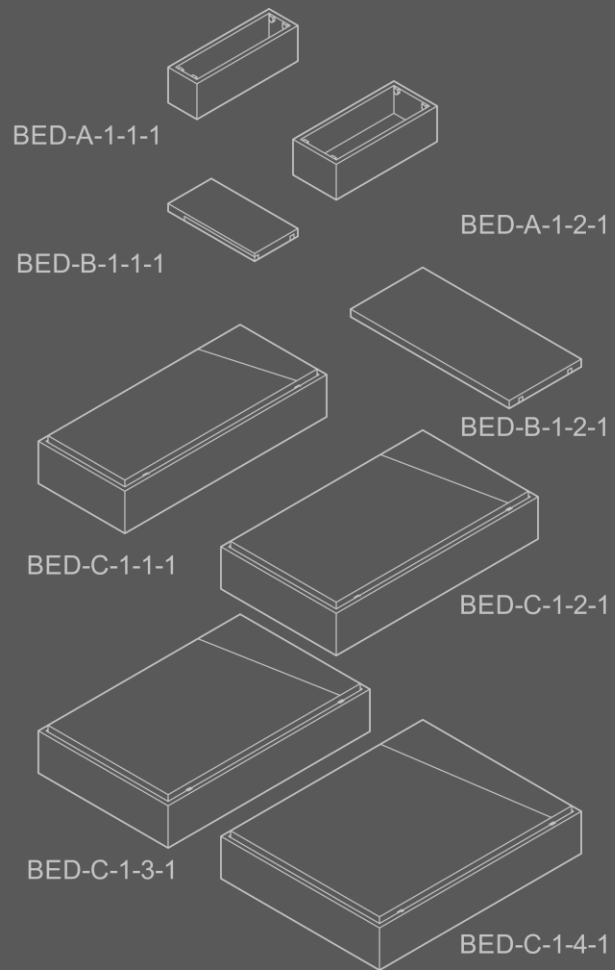
Possible configurations



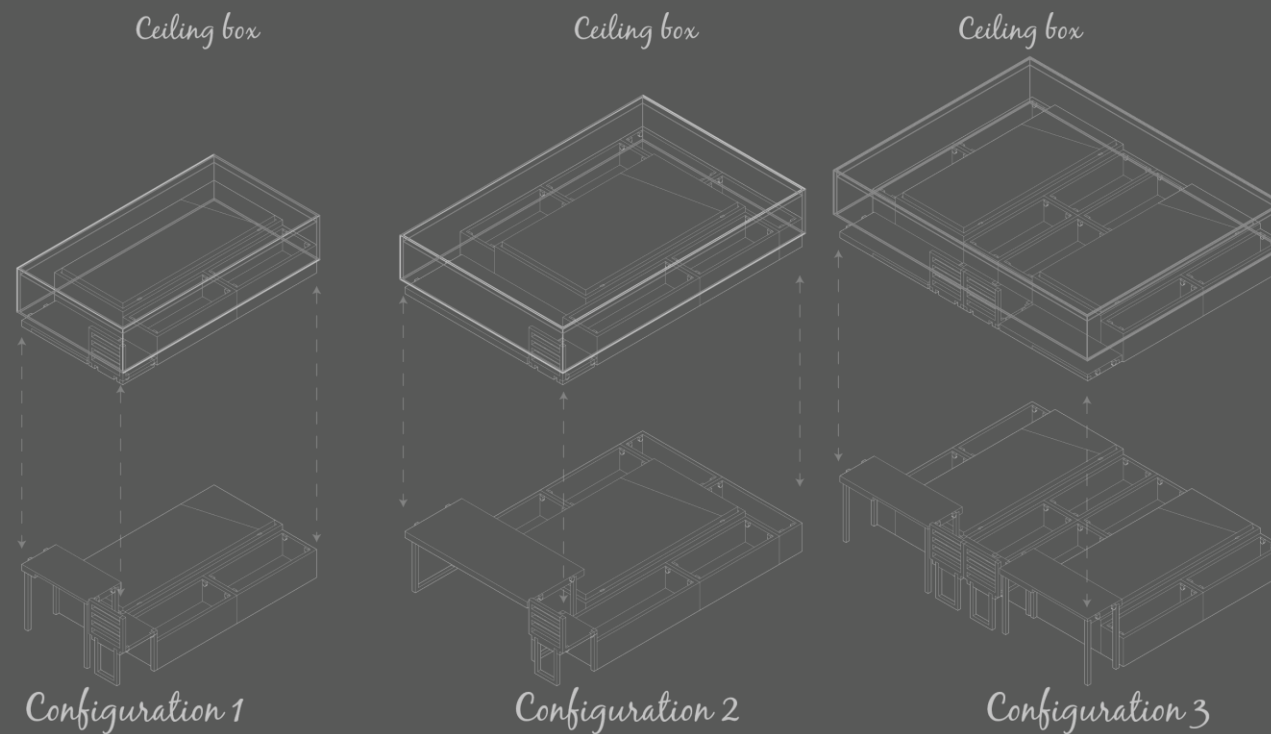
THE INFILL SYSTEM | DESIGN

1. Research
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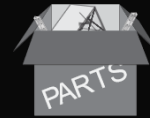
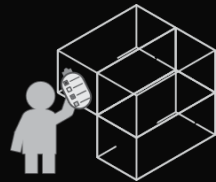
Catalog of pods - bedroom



Possible configurations



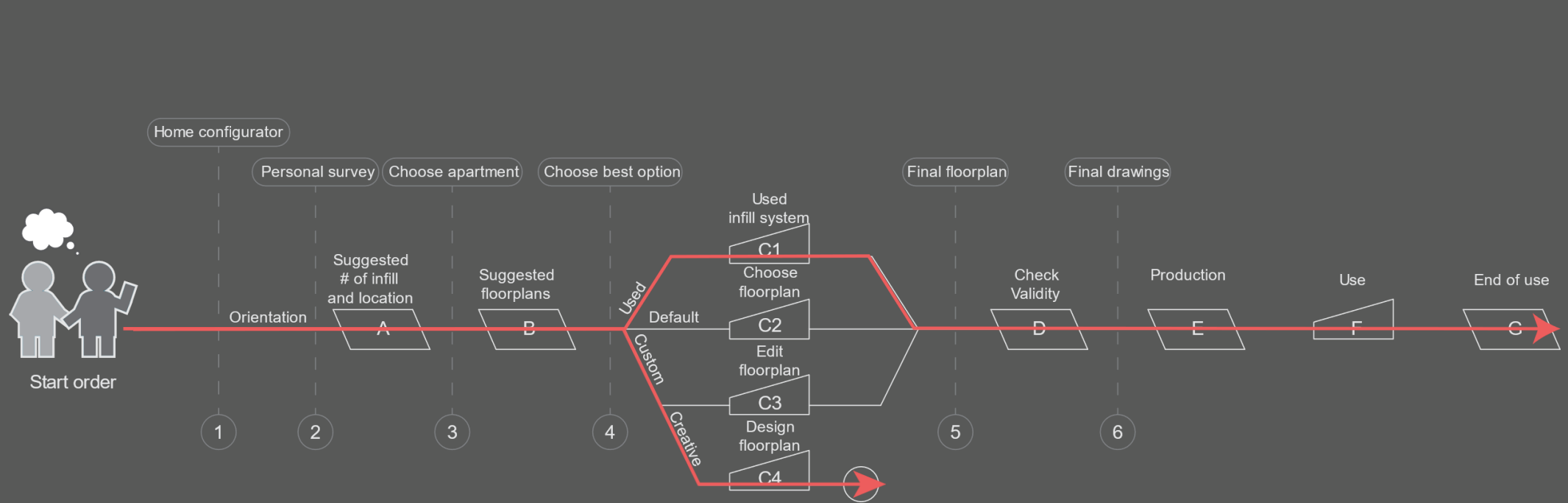
The building parts



OPEN BUILDING PARTS | DESIGN

1. Research
2. Design | The infill
3. **Design | The parts**
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5. Conclusion
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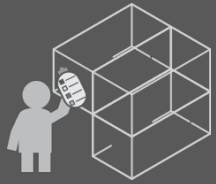
Final open building proposal



OPEN BUILDING PARTS | DESIGN

1. Research
2. Design | The infill
3. **Design | The parts**
4. Design | The case study
5. Conclusion
6. Until P5

Final open building proposal



Options zone

Preview geometry zone

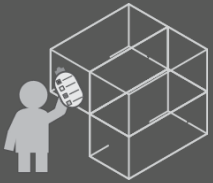
Preview data zone



OPEN BUILDING PARTS | DESIGN

1. Research
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Final open building proposal



The screenshot shows a mobile application interface for building design. It features a progress bar at the top, followed by two sections of questions: 'Resident questions' (Age, number of residents, hobbies, capital) and 'Location questions' (Geological location, orientation, height). A 3D grid of building units is displayed in the center, with some units highlighted in dark gray. A 'Preview data zone' box on the right shows 'Recommended number of units' and 'Estimated cost'. Navigation buttons 'Previous' and 'Next' are at the bottom.

1. Progress bar

2. Data to estimate a fitting location and number of units

3. Available units that fit requirements are displayed in dark gray

4. If the appropriate unit is selected the client can advance to the next step

Resident questions
Age, number of residents, hobbies, capital

Location questions
Geological location, orientation, height

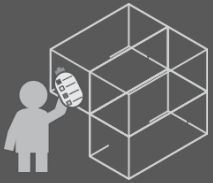
Preview data zone
Recommended number of units
Estimated cost

Previous Next

OPEN BUILDING PARTS | DESIGN

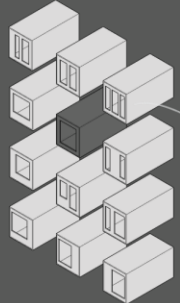
1. Research
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5. Conclusion
6. Until P5

Final open building proposal



B. Suggested unit

Unit options



Unit configurations

Empty Working
 Living Sleeping
 Dining Storage

1. Selection of suggested unit options

2. Selection of configurations

3. Preview of the selected unit and unit configuration

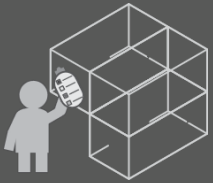
Preview data zone

Estimated cost

OPEN BUILDING PARTS | DESIGN

1. Research
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5. Conclusion
6. Until P5

Final open building proposal



C.3. Edit unit

Materials

Cataloge
Kitchen
Bathroom
Living room

Couches

1. Color and material of elements can change

2. Catalog of available elements

3. Preview of the selected unit and unit configuration

Preview data zone
Estimated cost

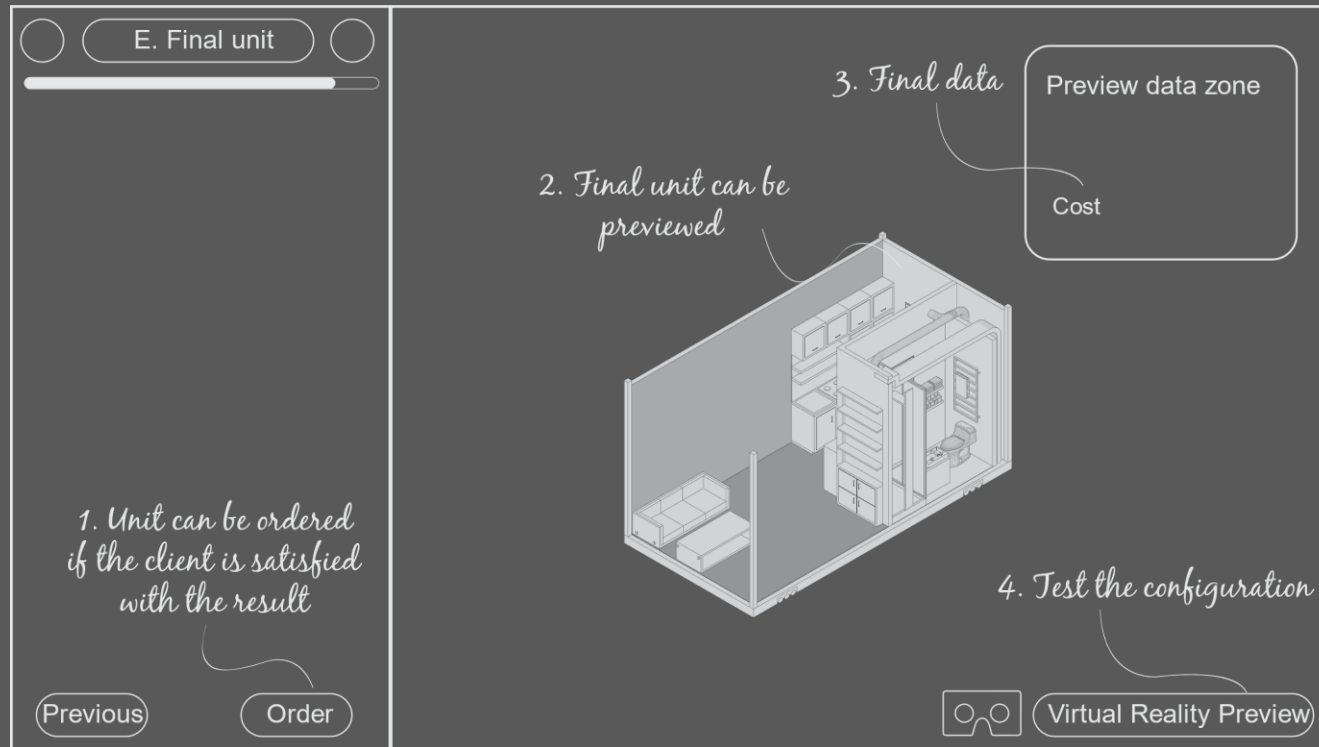
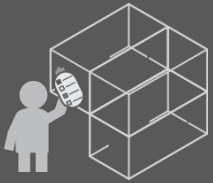
Previous Next

PARTS

OPEN BUILDING PARTS | DESIGN

1. Research
2. Design | The infill
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4. Design | The case study
5. Conclusion
6. Until P5

Final open building proposal



OPEN BUILDING PARTS | DESIGN

1. Research
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Implementation of the method



OPEN BUILDING PARTS | DESIGN

1. Research
2. Design | The infill
- 3. Design | The parts**
4. Design | The case study
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The kit of parts

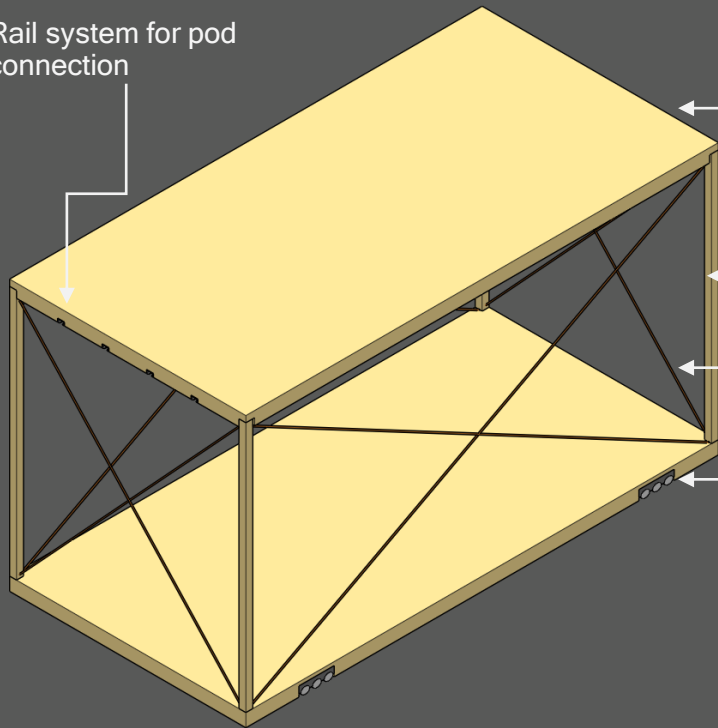


OPEN BUILDING PARTS | DESIGN

1. Research
2. Design | The infill
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5. Conclusion
6. Until P5

The unit

Rail system for pod connection



CLT Floor and ceiling

Secondary possibility: Corrugated steel with steel beams

Wooden column

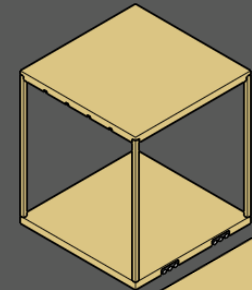
Secondary possibility: Steel columns

Temporal support

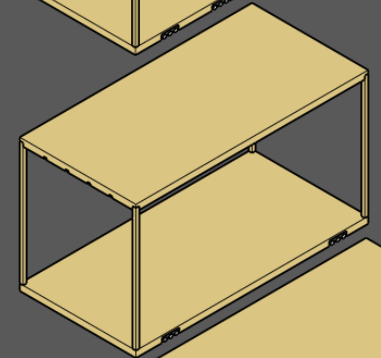
Rolling system



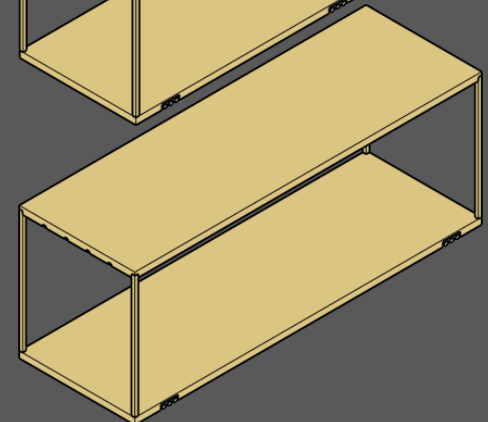
1M



2M



3M

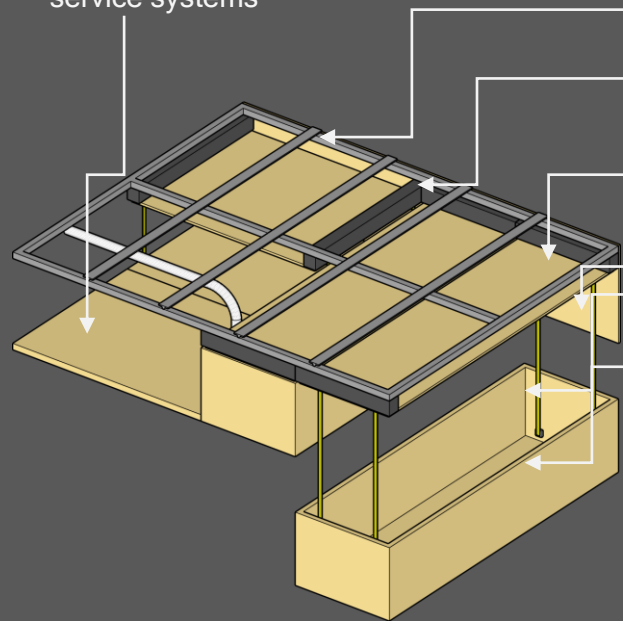


OPEN BUILDING PARTS | DESIGN

1. Research
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The infill subsystems

Empty slot for routing of service systems



Mounting rail

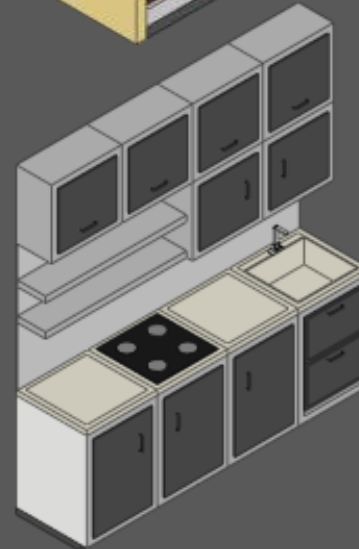
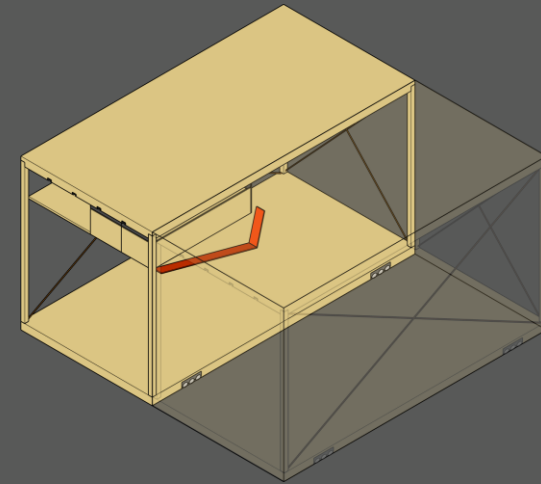
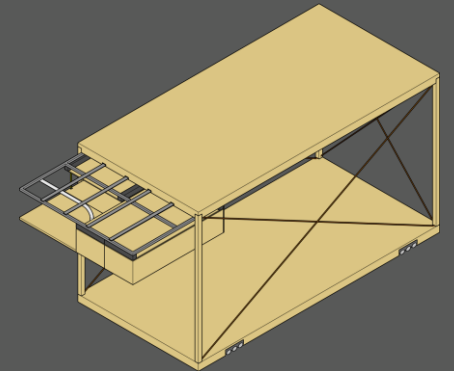
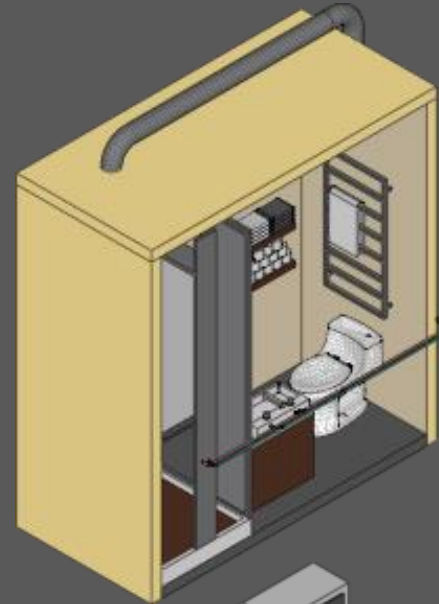
Electric motor

Ceiling board

Facing board

Suspension system

Storage box sub-component



OPEN BUILDING PARTS | DESIGN

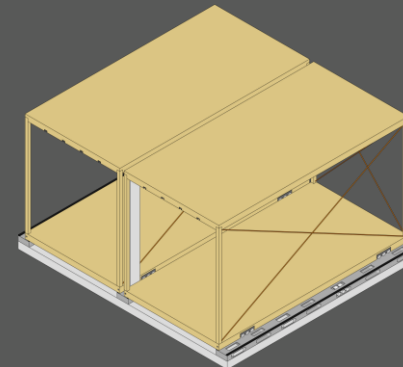
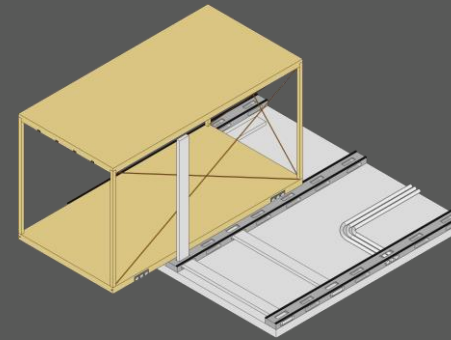
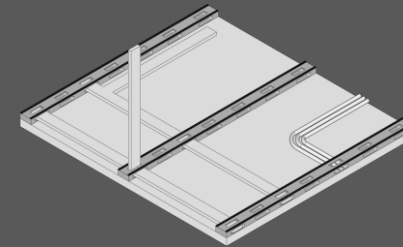
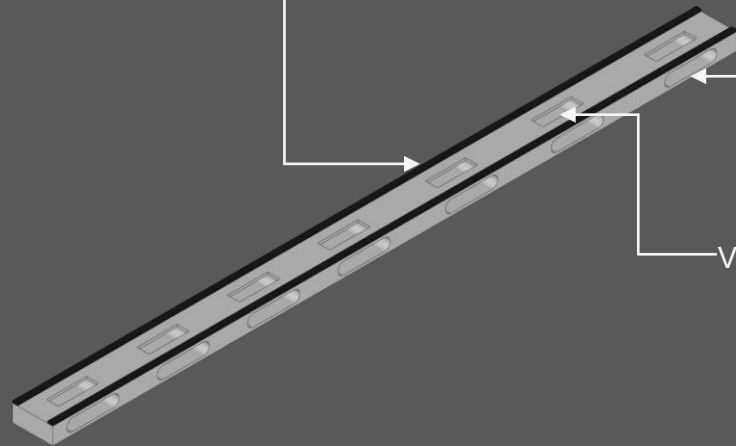
1. Research
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The connector

Pressure resistant insulation

Horizontal shaft

Vertical shaft




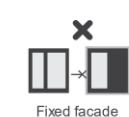


OPEN BUILDING PARTS | DESIGN





1. Research
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The support rulebook









New Building

<p>1</p>  <p>Removable facade per level</p>	<p>X</p>  <p>Fixed facade</p>
<p>2</p>  <p>Flexible facade infill elements</p>	<p>X</p>  <p>Fixed facade elements</p>

Existing building stock

<p>1</p>  <p>Removable from top to bottom</p>	<p>?</p>  <p>Fixed facade</p>
<p>2</p>  <p>Recyclable elements</p>	<p>?</p>  <p>Non recyclable elements</p>

Existing building stock

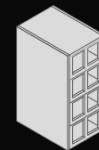
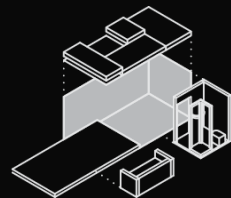
<p>1</p>  <p>System does not cross over multiple units</p>	<p>X</p>  <p>System does cross multiple units</p>
<p>2</p>  <p>System does not block door from opening</p>	<p>X</p>  <p>System can block door from opening</p>
<p>3</p>  <p>System alligns with the grid</p>	<p>X</p>  <p>System does not alligi with the grid</p>
<p>4</p>  <p>System is usable</p>	<p>X</p>  <p>System is not usable</p>

Rulebook page 4

Rulebook page 5



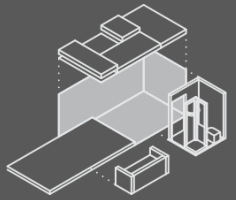
The case study



THE CASE STUDY | DESIGN

- 1. Research
- 2. Design | The infill
- 3. Design | The parts
- 4. **Design | The case study**
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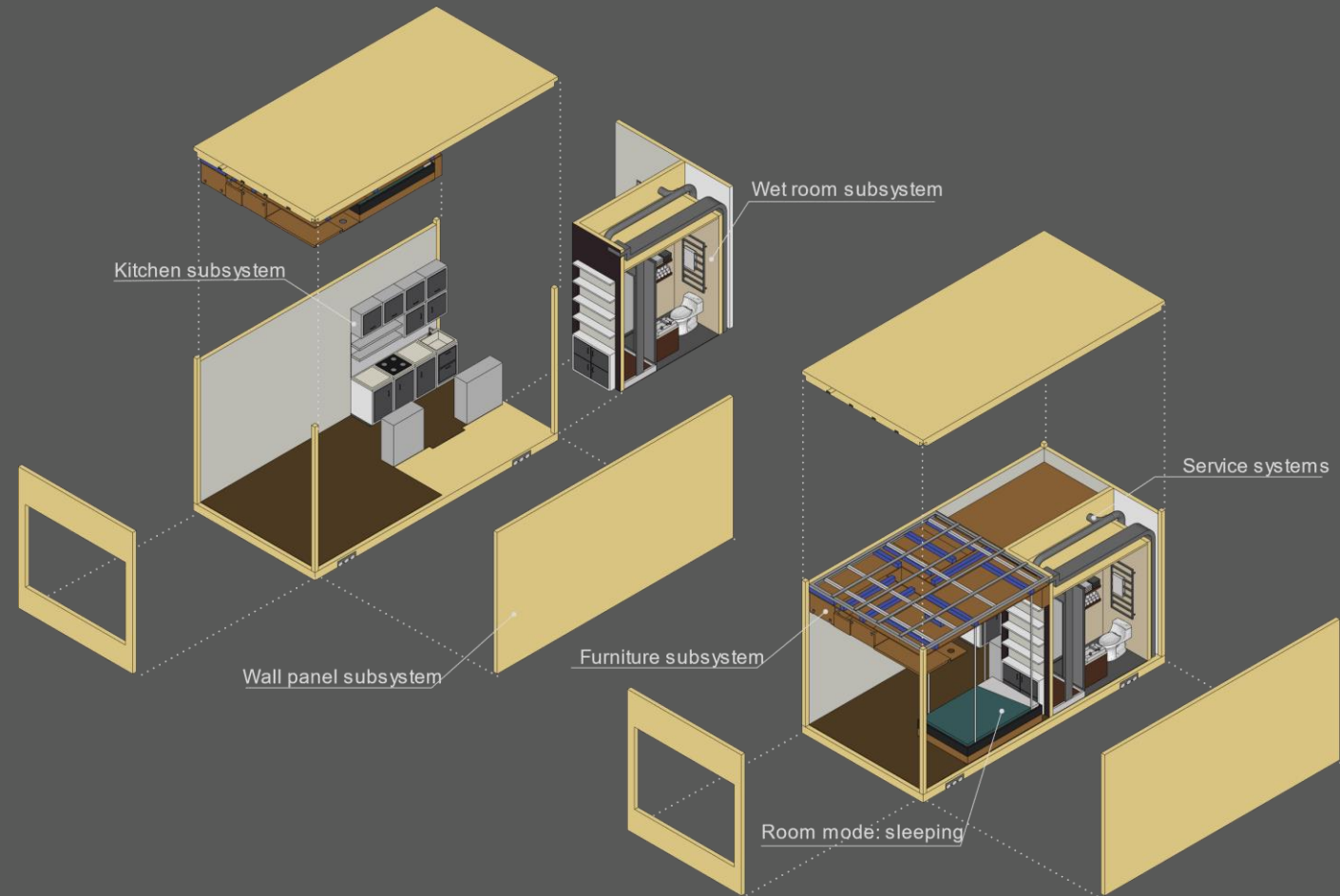
Implementation of the method



THE CASE STUDY | DESIGN

1. Research
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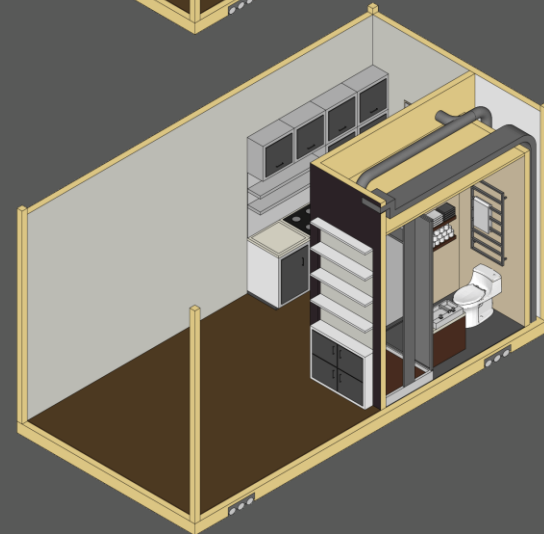
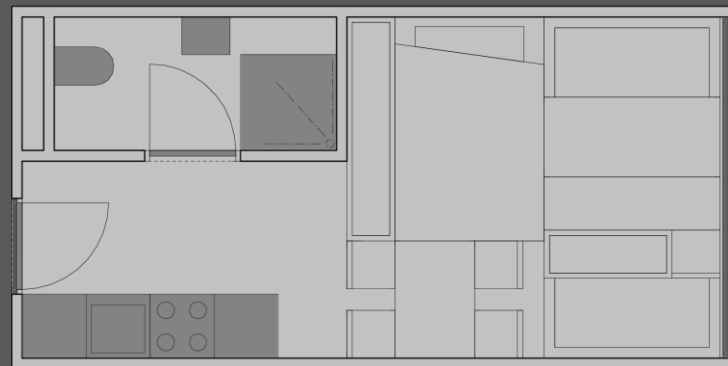
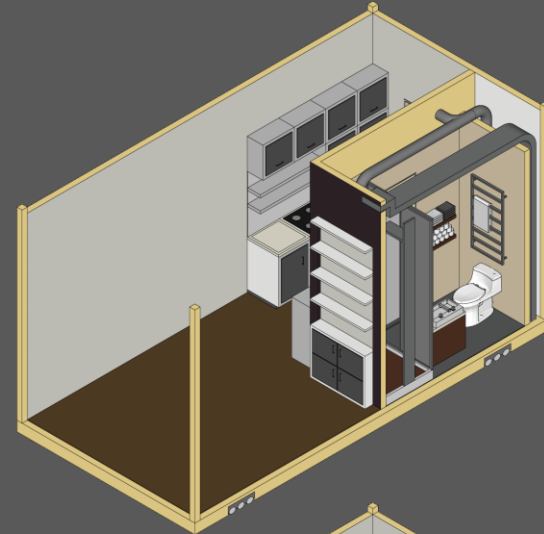
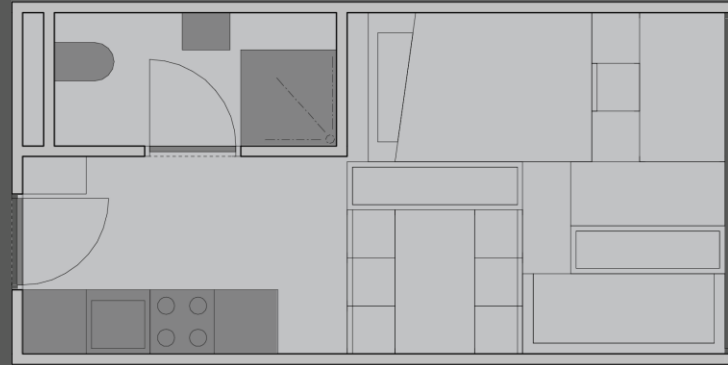
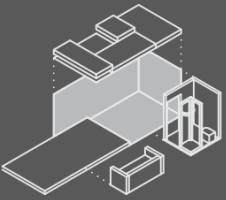
Implementation of the method



THE CASE STUDY | DESIGN

- 1. Research
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Implementation of the method



THE CASE STUDY | DESIGN

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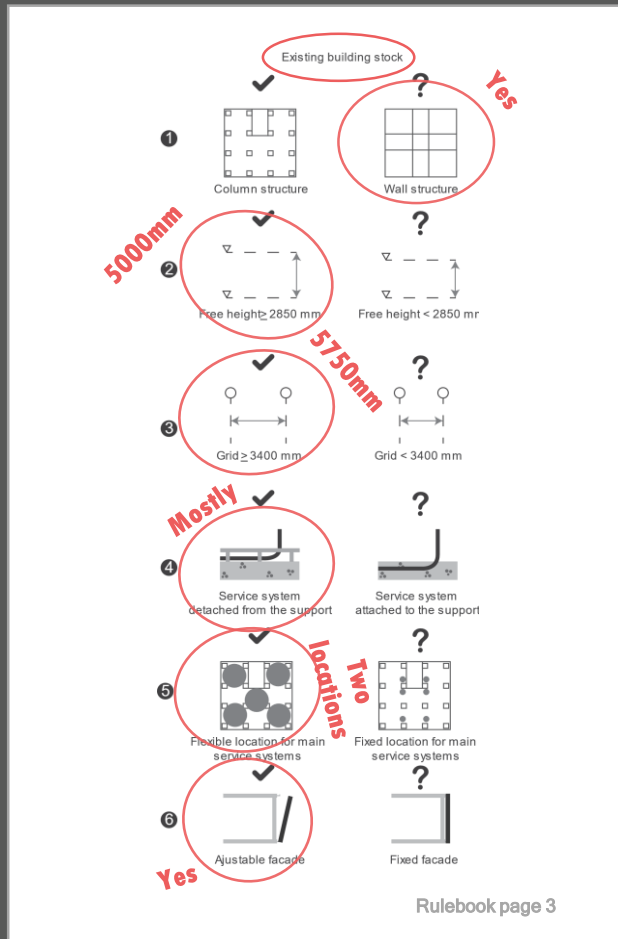
The case study



THE CASE STUDY | DESIGN

1. Research
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Analysis

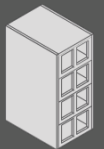
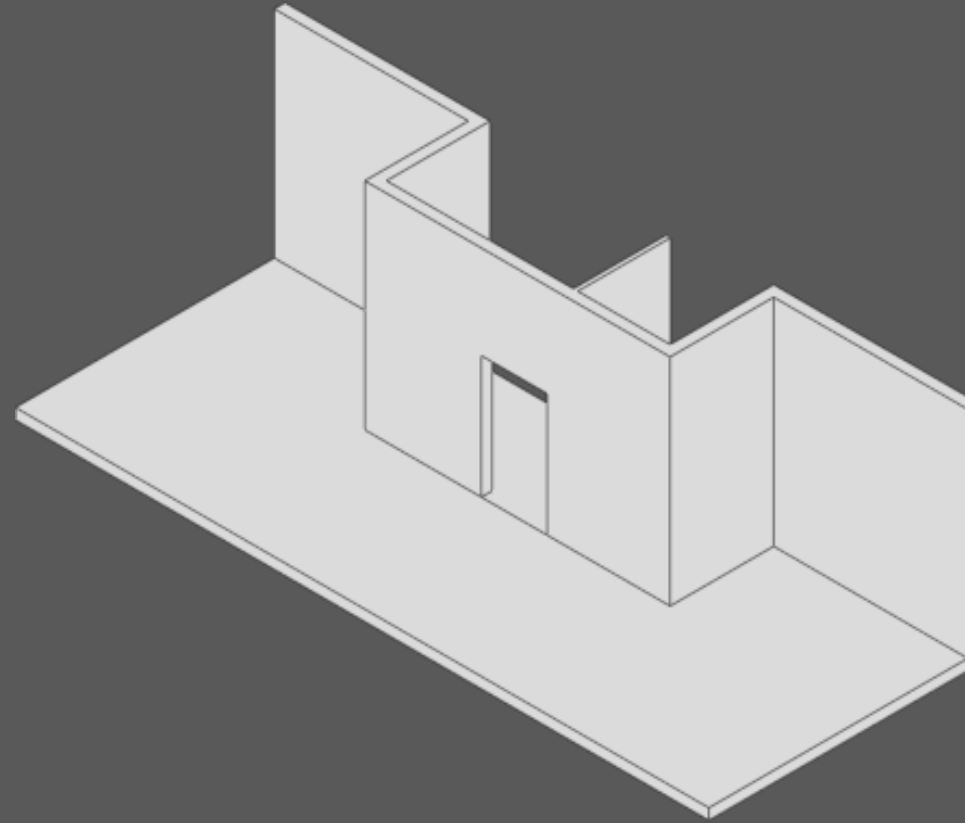


THE CASE STUDY | DESIGN

1. Research
2. Design | The infill
3. Design | The parts
4. **Design | The case study**
5. Conclusion
6. Until P5

Procedure

- Overview of the support structure

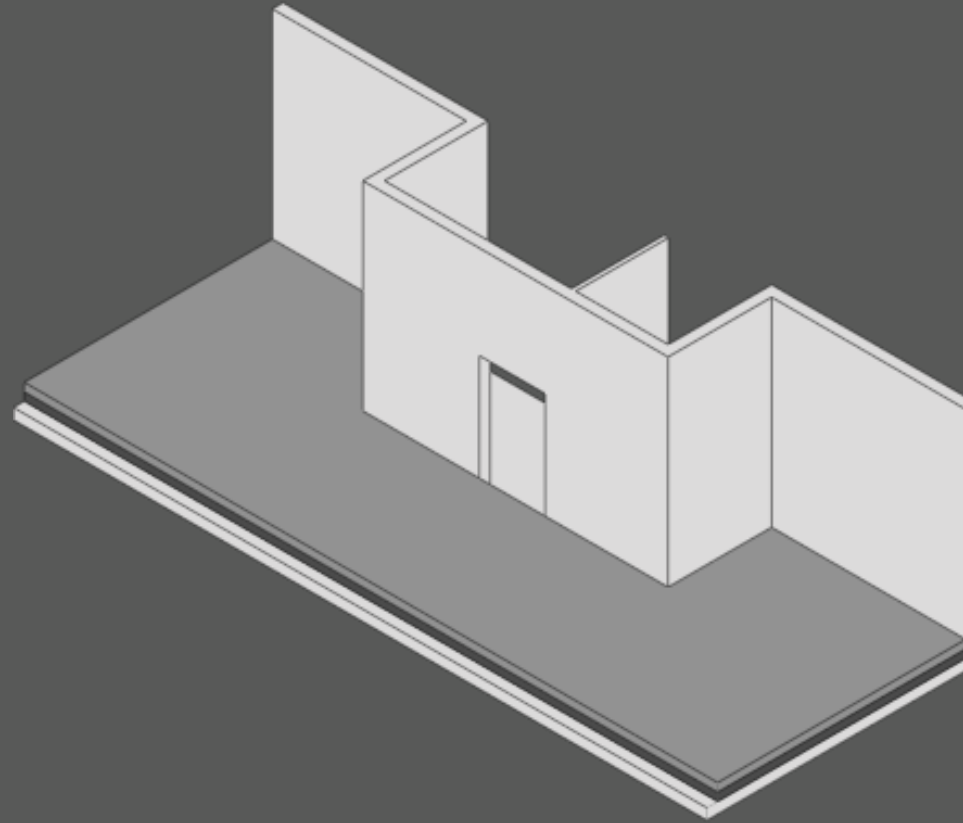


THE CASE STUDY | DESIGN

1. Research
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4. Design | The case study
5. Conclusion
6. VR Exhibition

Procedure

- Overview of the support structure
- New floor height

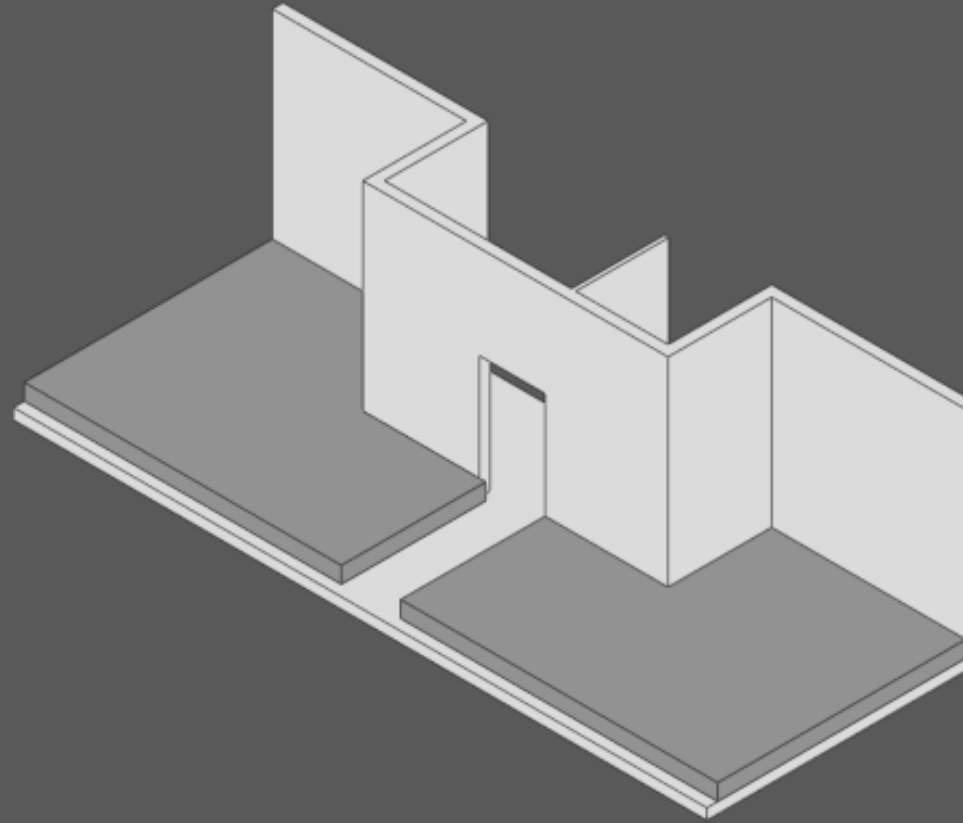


THE CASE STUDY | DESIGN

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4. **Design | The case study**
5. Conclusion
6. VR Exhibition

Procedure

- Overview of the support structure
- New floor height
- Arrangement of new apartments

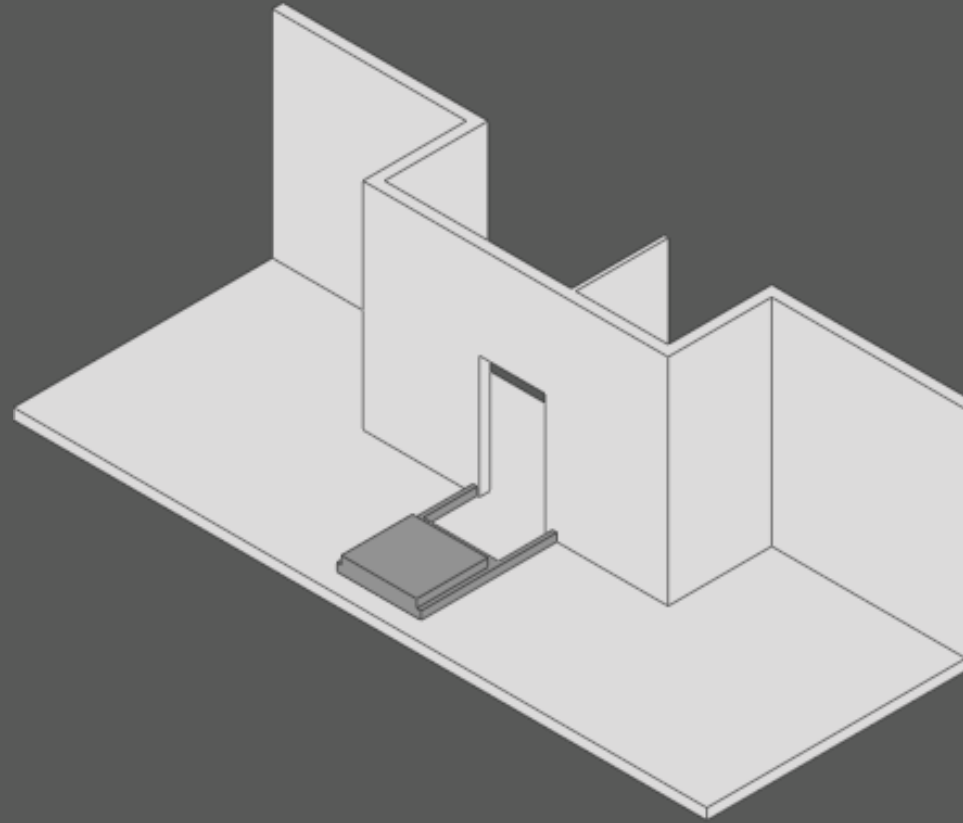


THE CASE STUDY | DESIGN

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3. Design | The parts
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5. Conclusion
6. VR Exhibition

Procedure

- Overview of the support structure
- New floor height
- Arrangement of new apartments
- Place new vertical connection

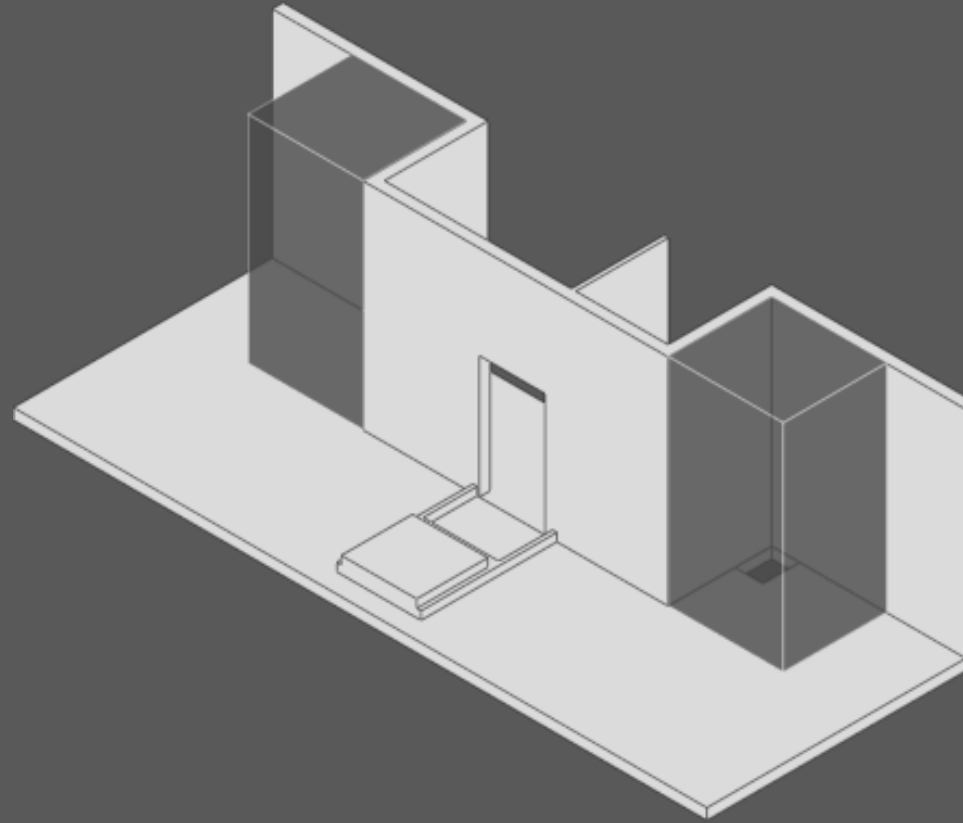


THE CASE STUDY | DESIGN

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6. VR Exhibition

Procedure

- Overview of the support structure
- New floor height
- Arrangement of new apartments
- Place new vertical connection
- Decide on preferred location for wet rooms

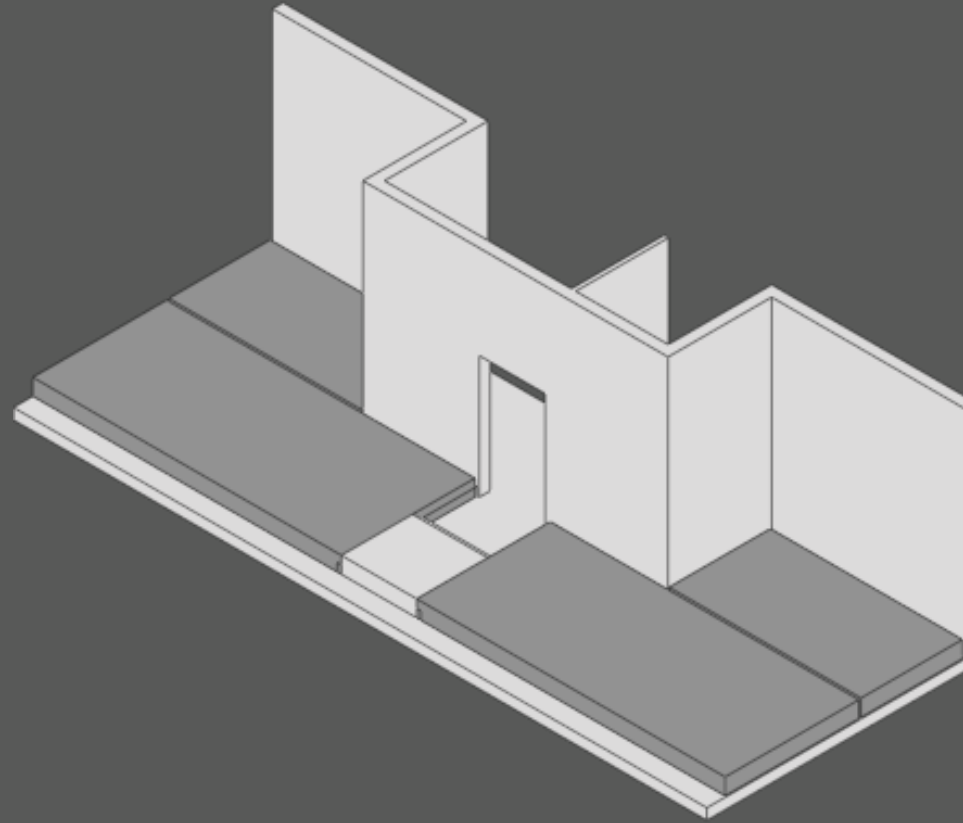


THE CASE STUDY | DESIGN

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5. Conclusion
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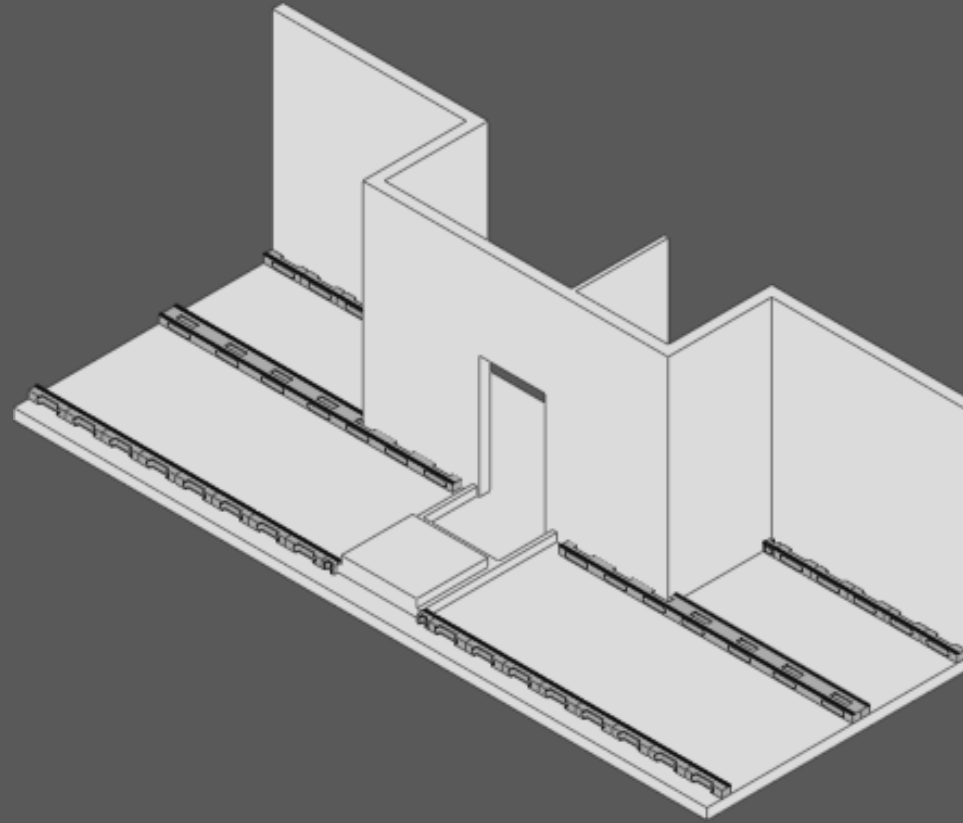
Procedure

- Overview of the support structure
- New floor height
- Arrangement of new apartments
- Place new vertical connection
- Decide on preferred location for wet rooms
- Design size and placement of units



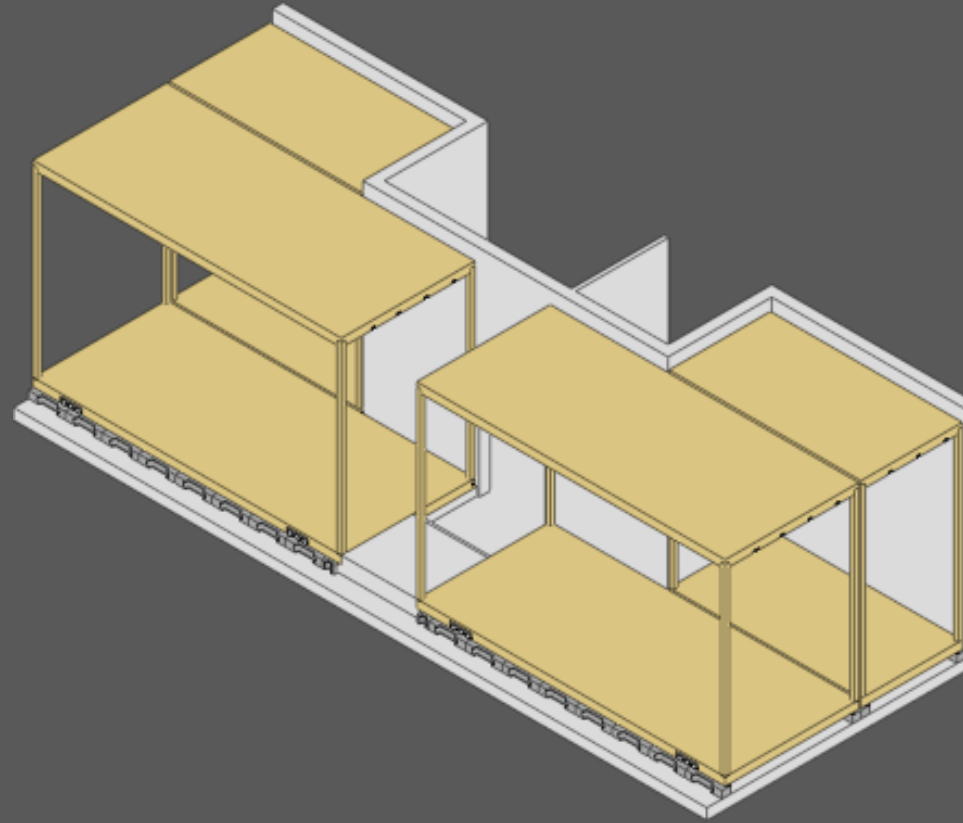
Procedure

- Overview of the support structure
- New floor height
- Arrangement of new apartments
- Place new vertical connection
- Decide on preferred location for wet rooms
- Design size and placement of units
- Place the connector



Procedure

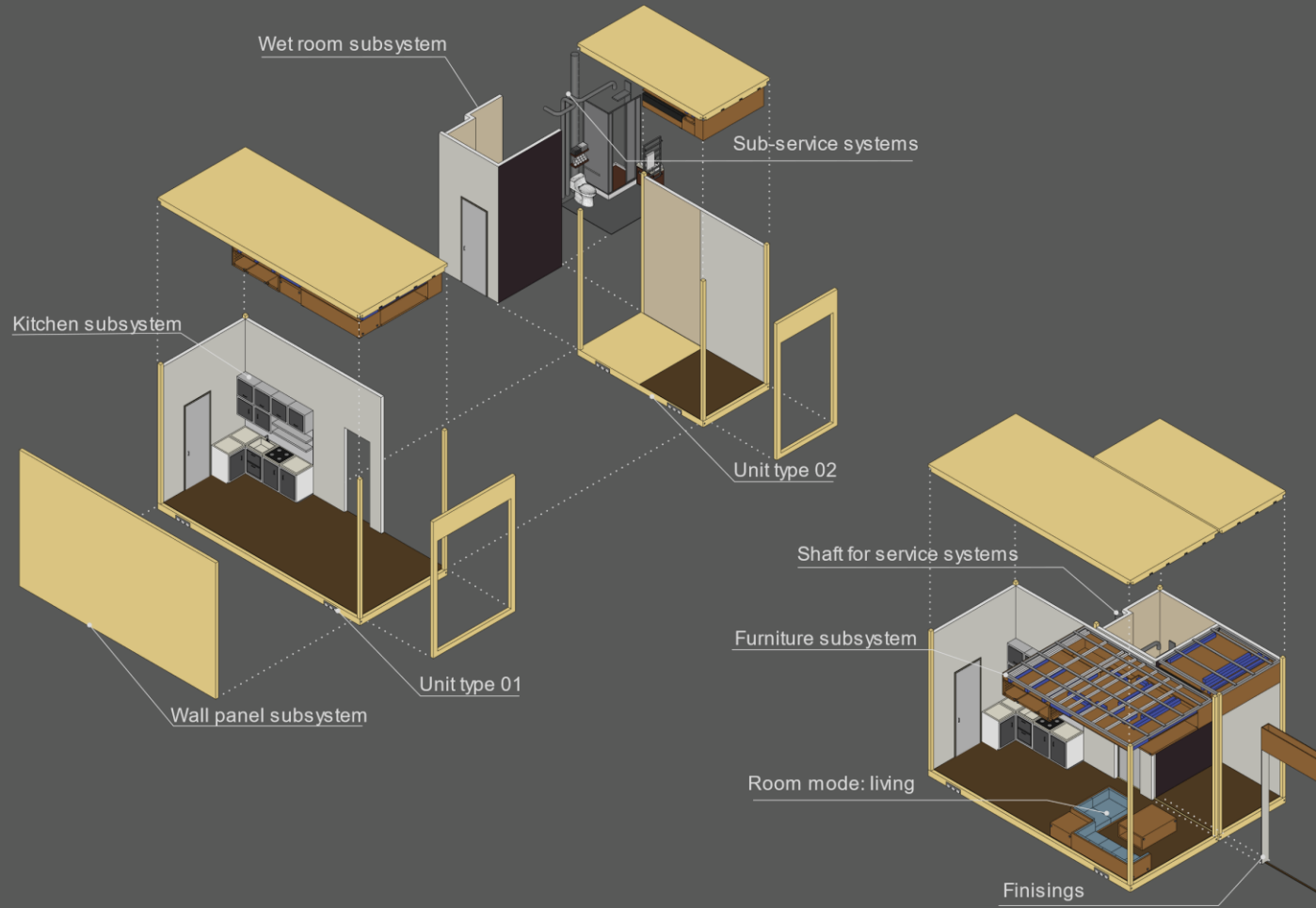
- Overview of the support structure
- New floor height
- Arrangement of new apartments
- Place new vertical connection
- Decide on preferred location for wet rooms
- Design size and placement of units
- Place the connector
- Place the units



THE CASE STUDY | DESIGN

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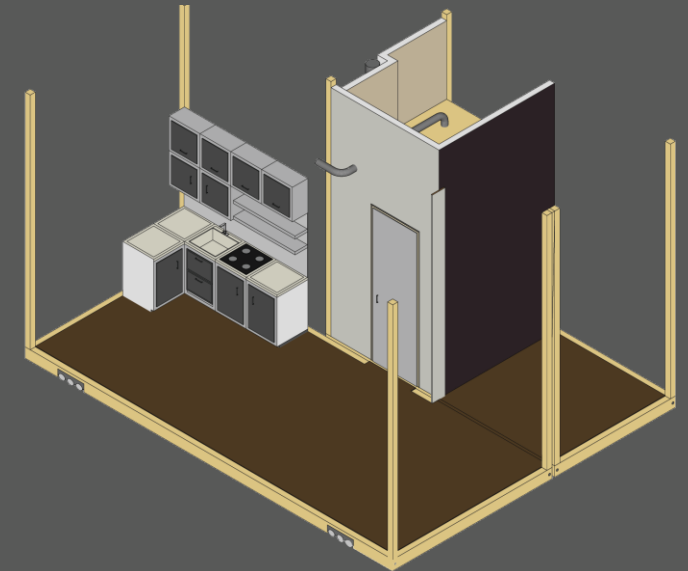
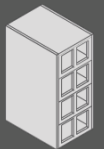
Configurations



THE CASE STUDY | DESIGN

- 1. Research
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- 3. Design | The parts
- 4. Design | The case study
- 5. Conclusion
- 6. VR Exhibition

Configurations



Conclusion

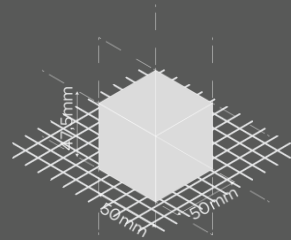


CONCLUSION

1. Research
2. Design | The infill
3. Design | The parts
4. Design | The case study
5. **Conclusion**
6. VR Exhibition

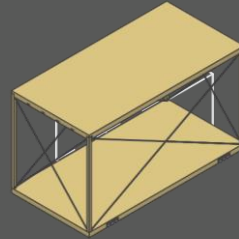
Design components

The infill system

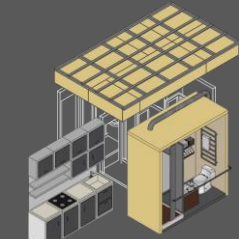


Dimensional coordination System

Design parts



Volumetric unit



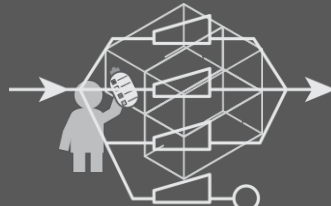
Catalog of modular pods

Future research

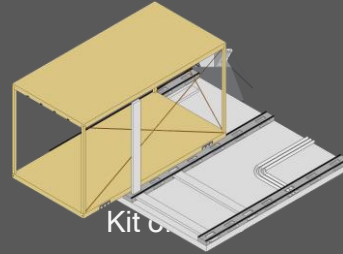


Technical proposal

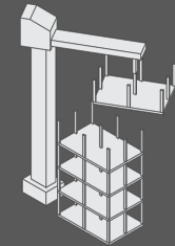
The open Building parts



User interaction

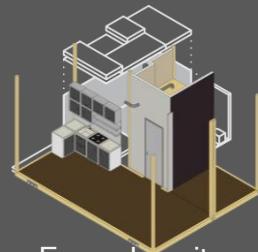


Kit of parts

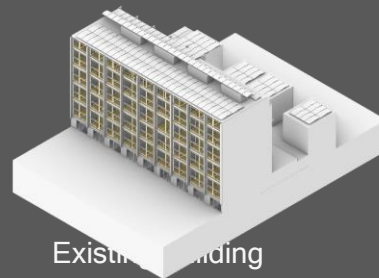


The support system

Case study



Example units



Existing building



Road map and business model

VR Exhibition

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Master thesis presentation P5