HOWA

RADICAL LOW-COST HOME FROM WASTE

With over 300 million tons of plastic waste produced globally each year and an escalating housing crisis characterized by soaring costs, scarce materials, and the growing gap between rich and poor, our microhome design presents a radical transformative solution. By leveraging recycled materials, including plastics, textiles, and glass, we turn waste into structurally optimized building blocks for sustainable living.

Our design begins at “Urban Mines,” where waste is meticulously sorted and separated based on reusability. Recycled materials are then transported to local fabrication centers, also known as Urban Factories, where they are pressed into flat surfaces and assembled into modular components.

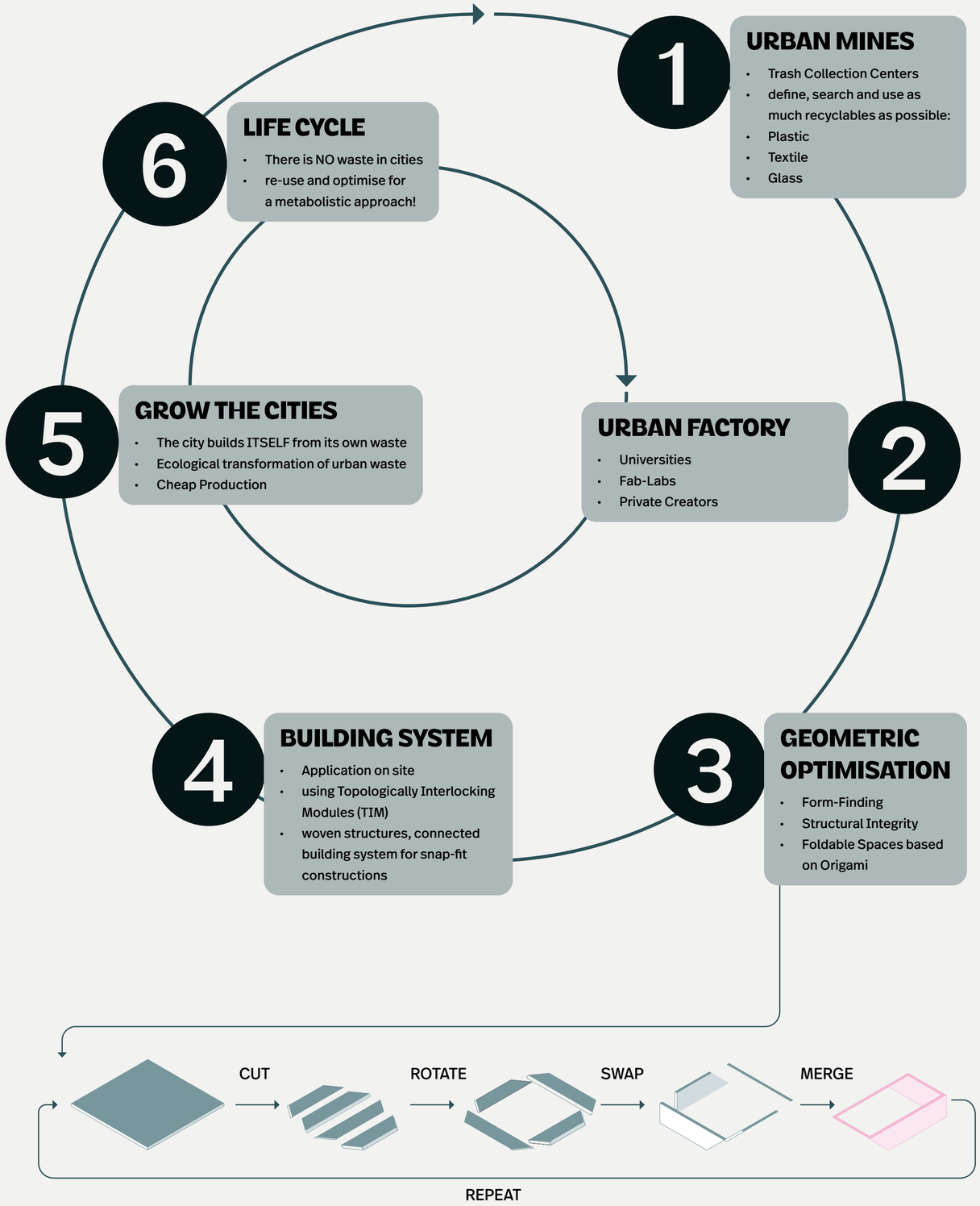
These modules, based on the geometric transformation of platonic solids and topologically interlocking modules (TIM), provide a versatile and robust foundation for constructing microhomes, but also large building complexes. The simplicity and flexibility of this modular system allow for houses to be easily remodeled and reconfigured according to changing needs, much like a dynamic and adaptable puzzle.

Natural materials, such as rammed earth, are incorporated for insulation, enhancing the environmental harmony of our design. The result is a sustainable housing solution that not only addresses the global waste crisis but also offers a scalable and cost-effective alternative to traditional construction methods.

By turning waste into wealth, our innovative approach paves the way for a greener, fairer, and more adaptable future in housing.

STRUCTURE COSTS ESTIMATES

• 1x1sqm of recycled plastic for construction of 3 3D Modules	30 EUR
• 1 folded Module	10 EUR
• Tiny House: 360 Modules	3600 EUR
• Beams and Holders	1200 EUR
• Insulation and Shell (Kingspan)	1700 EUR
• Roof Construction (Kingspan)	2400 EUR
TOTAL	**8900** EUR



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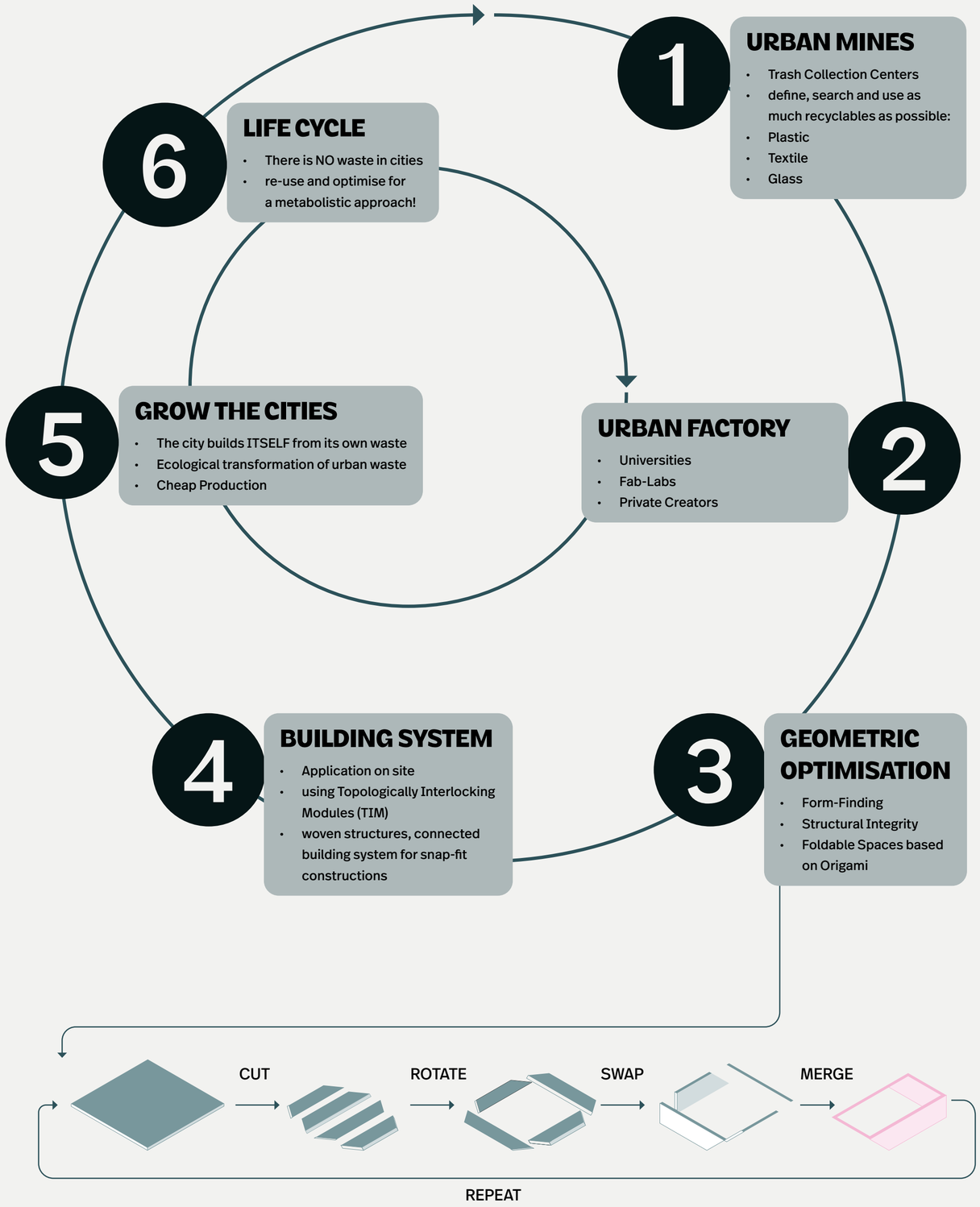
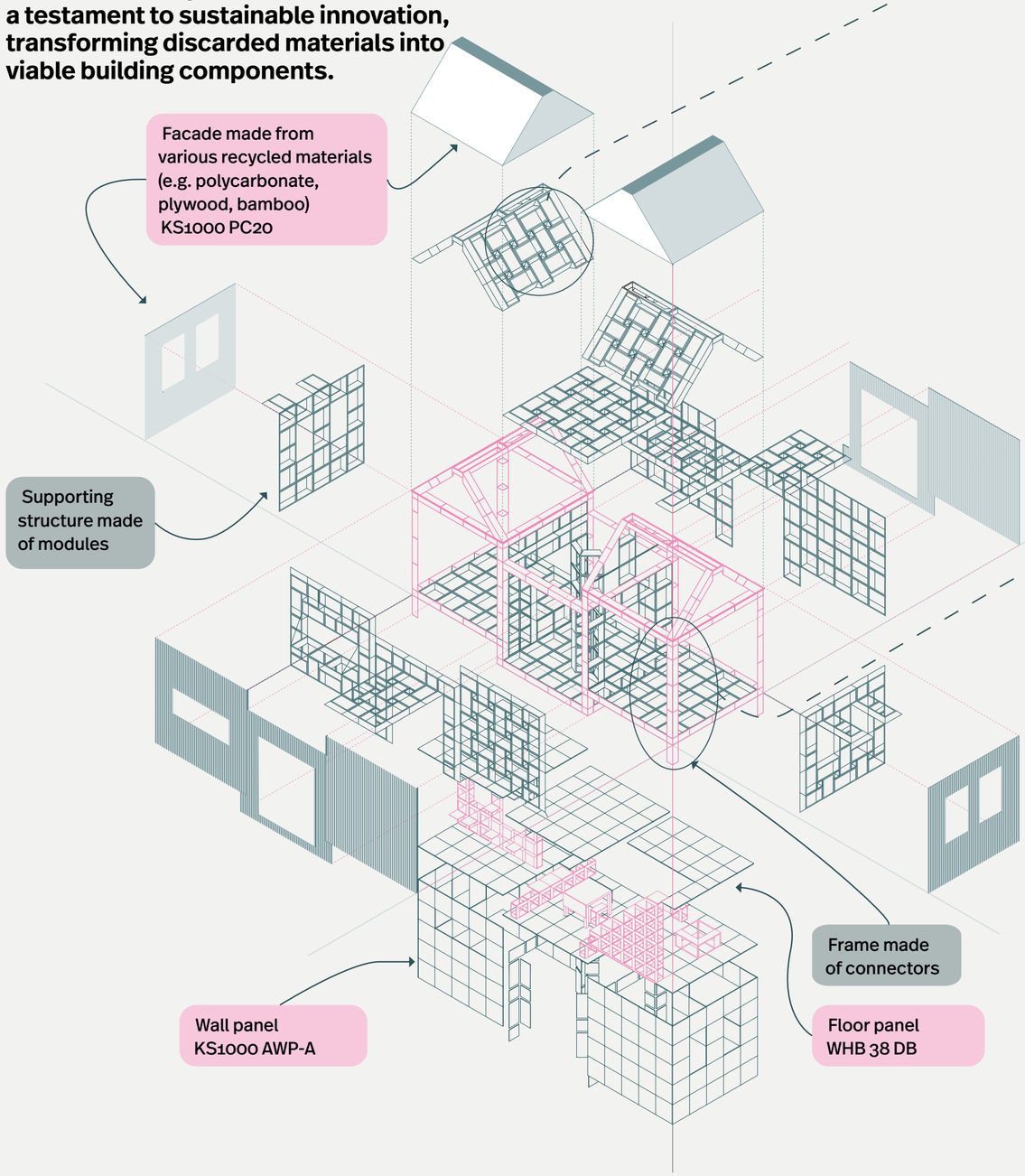


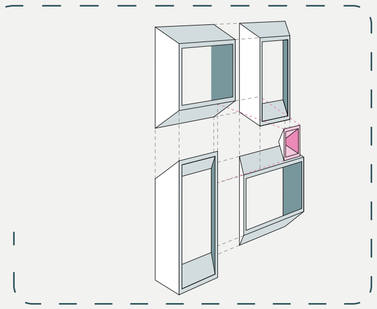
SYSTEM

FABRICATION PROCESS:
FROM WASTE TO WONDER

Our fabrication process is a testament to sustainable innovation, transforming discarded materials into viable building components.

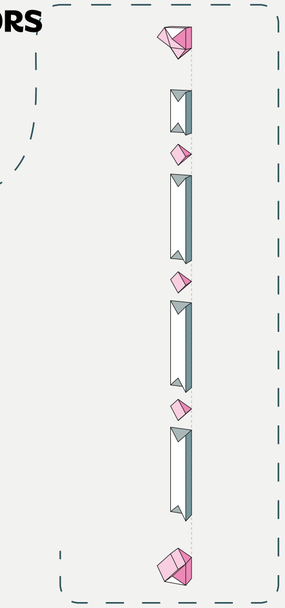


MODULES PERSPECTIVE

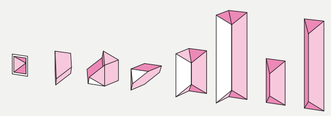


TYPES OF MODULES

CONNECTORS



TYPES OF CONNECTORS



HERE'S HOW IT WORKS

WASTE COLLECTION AT URBAN MINES

Waste is gathered from various local sources and brought to Urban Mines, specialized centers dedicated to sorting and separating materials based on their reusability.Recycled materials include plastics, textiles, and glass, which are categorized for further processing.

Processing at Urban Factories:The sorted materials are transported to local fabrication centers, such as universities and fab labs, or on-site deployable hubs, equipped with machines and engines capable of production and recycling.

At these Urban Factories, recycled plastics and other materials are pressed into flat surfaces, which form the basis of our modular components.

MODULE CREATION

Using advanced techniques, such as CNC cutting, these flat surfaces are transformed into modules based on the geometric principles of platonic solids and topologically interlocking modules (TIM).

The folding and bending of materials are inspired by Origami, ensuring each module is strong, lightweight, and easy to assemble.

The walls of the modules can be perforated for drainage, cables, and other utilities, enhancing their functionality.

CONNECTOR CREATION

To guarantee a solid supporting structure, connector elements are assembled together with the modules. These structural element\s are the counter form to the modules. They also will be produced by advanced fabrication methods, such as CNC cutting. A possible material for the connectors is recycled wood, but also other recycled materials are imaginable.

INTEGRATION OF NATURAL MATERIALS

To enhance insulation and environmental integration, natural materials such as rammed earth are incorporated into the modules. This combination of recycled and natural materials provides both durability and sustainability.

MODULAR ASSEMBLY

The modules are designed to be easily assembled and reconfigured, allowing for flexible and adaptive housing solutions.

This adaptability means that homes can be customized and remodeled over time to meet changing needs, offering a dynamic approach to living spaces.

By focusing on simplicity, reusability, and environmental harmony, our fabrication process not only addresses the pressing issues of waste management and housing shortages but also sets a new standard for sustainable living.

SOCIETY

TRANSFORMATIVE BENEFITS
A VISION FOR SUSTAINABLE LIVING

ENVIRONMENTAL IMPACT:
By utilizing recycled materials such as plastics, textiles, wood, and glass, our design significantly reduces waste and promotes a circular economy.
The integration of natural materials like rammed earth not only enhances insulation but also minimizes the carbon footprint of construction. A welcome side effect is that the whole building frame can be used as a plant grower.

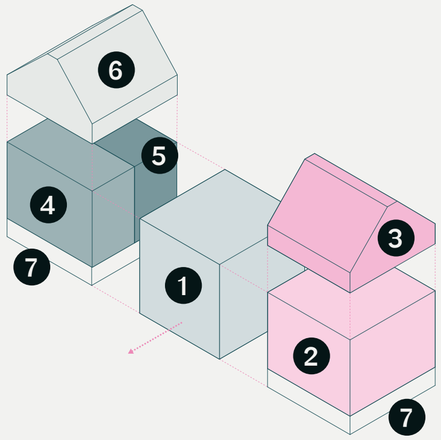
COST-EFFECTIVE CONSTRUCTION:
The use of locally sourced waste and local fabrication centers (Urban Factories) ensures a sustainable production cycle, reducing transportation costs and supporting local economies.
The simple and efficient manufacturing process keeps production costs low, making radical low-cost housing accessible to the majority.

ADAPTABILITY AND FLEXIBILITY:
The modular nature of our design allows for easy assembly, disassembly, and reconfiguration of living spaces. Homes can be customized and remodeled over time to meet changing needs, offering a dynamic and versatile solution to housing.
This flexibility is akin to a dynamic puzzle, where modules can be added, removed, or rearranged to suit the homeowner's preferences and requirements.

COMMUNITY EMPOWERMENT:
Involving local universities and fab labs, or any kind of active community in the production process fosters community engagement and education. It empowers local communities to participate in sustainable practices and innovation.
The project promotes collaboration between various stakeholders, including architects, designers, and environmental experts, driving collective action towards sustainable urban development.

SCALABLE SOLUTION:
Our design presents a scalable solution that can be adapted to different urban contexts and housing needs. From individual microhomes to larger community developments, the modular approach provides a versatile framework for sustainable living.
The ability to repurpose and redesign modules ensures longevity and adaptability, making this a future-proof solution for housing.

MICRO-HOUSE FUNCTIONS



1. Community & entrance
2. Working & living
3. Sleeping
4. Kitchen
5. Bathroom
6. Technical room
7. Gardening & waste

ROOF
- Top-facing tiles collect water and bring it down towards collection spots
- Gutter and Downspout leading to a water tank

WATER
- Water collection tank located in the roof area
- First-Flush-Diverters

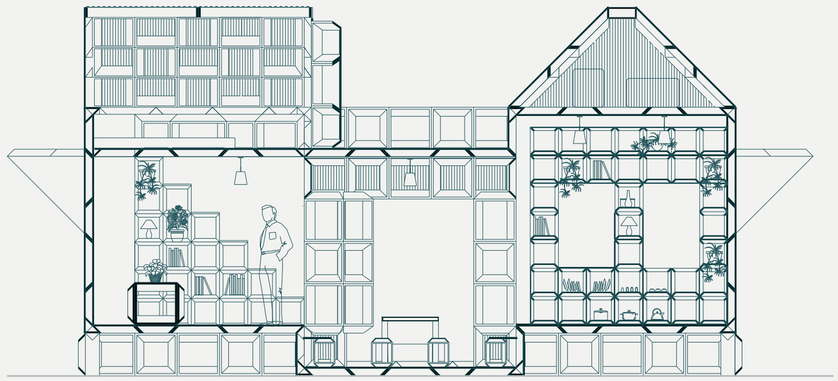
TECHNICAL ROOM
- Battery storage
- Inverter
- LED lighting throughout the tiny house

WATER FILTRATION
- Pre-filtration system
- Sediment filtration
- Using hollow spaces inside the modules (dry walls between rooms) as shared walls:
- Planting plants and drainage as a self-watering and filtering system
- Usage according to functionality: delivering clean water to kitchen and shower

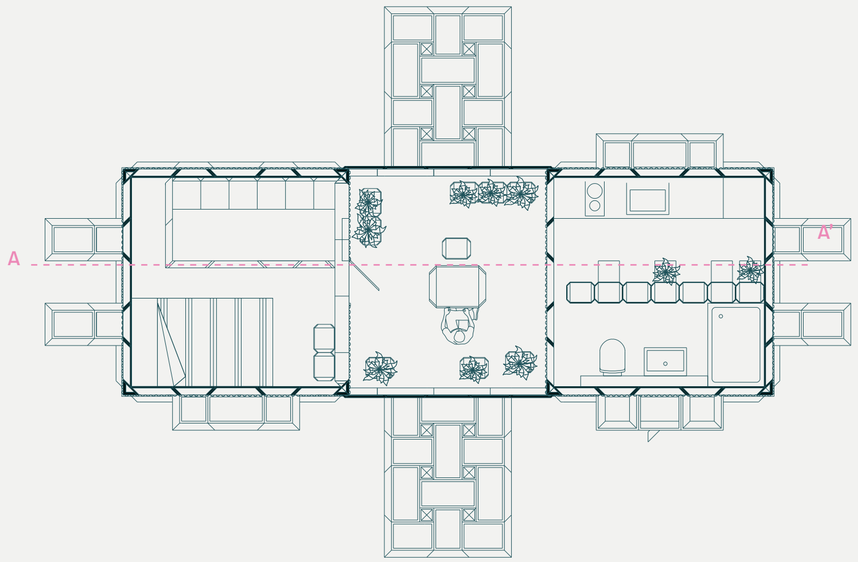
FLOWER BED
- Using rest-water and UV Lighting in a "Drawer": basement provides a container for food-production using grey-water

URBAN FURNITURE
- Using additional modules to extend the Tiny House towards the city: the modules and their adaptability offer not only the possibility to create more housing units, but are fit due to their scale for extension through furniture

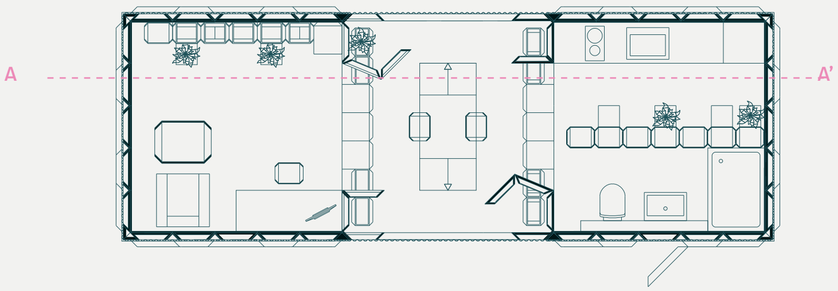
SECTION A-A’



GROUND FLOOR



ELEVATED FLOOR



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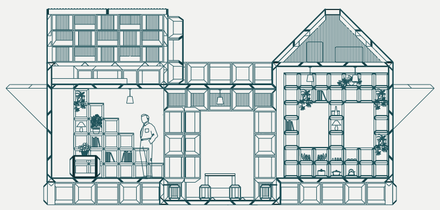
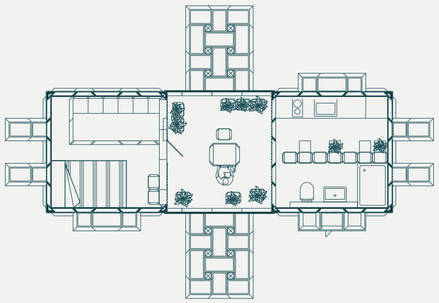
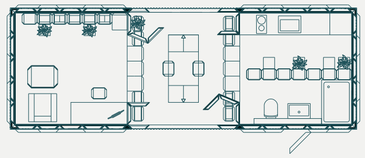
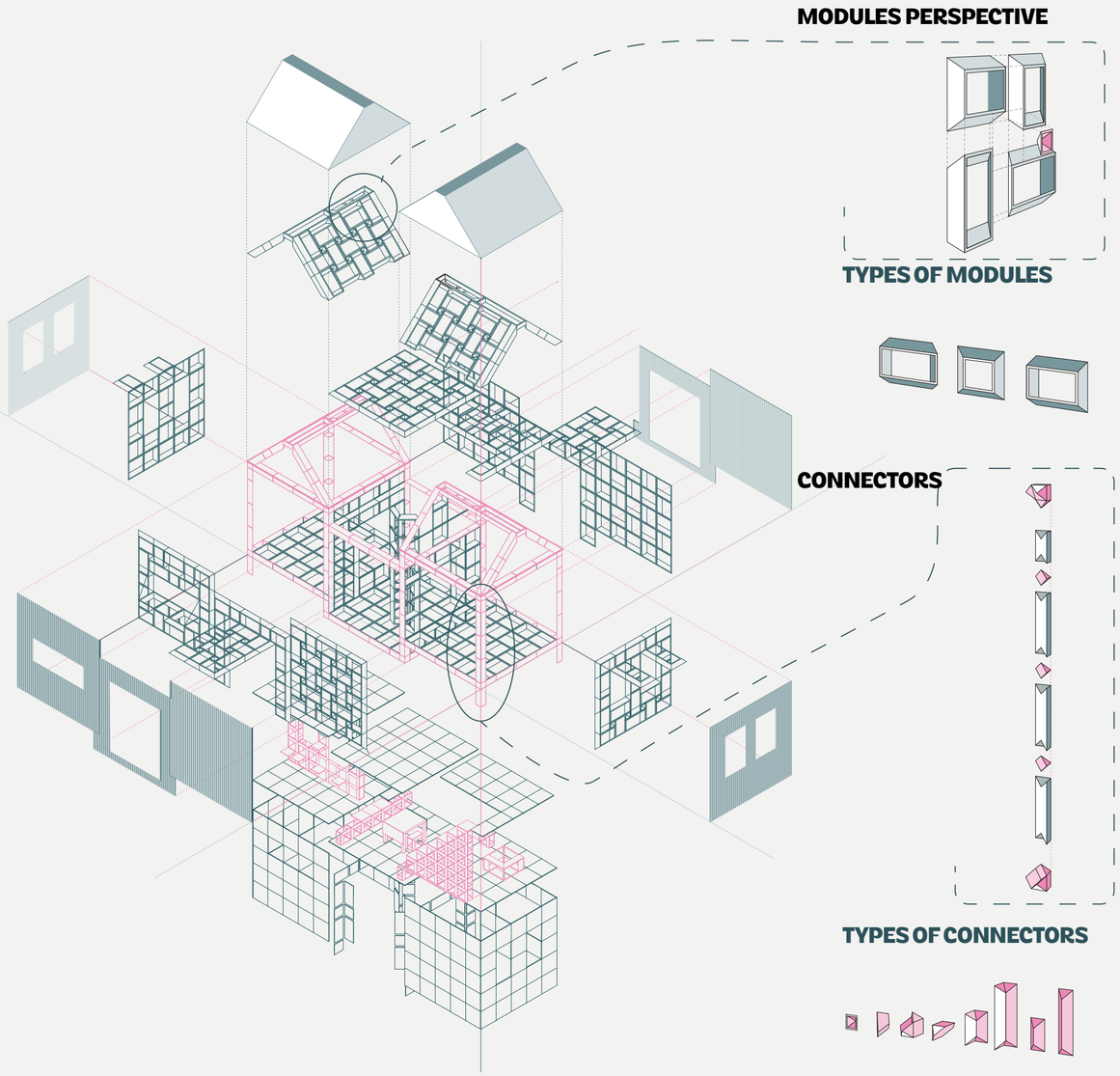
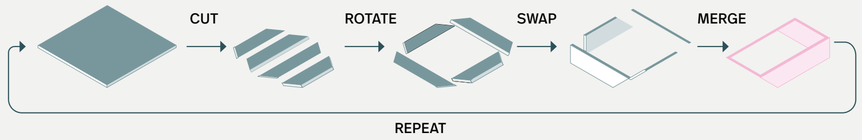


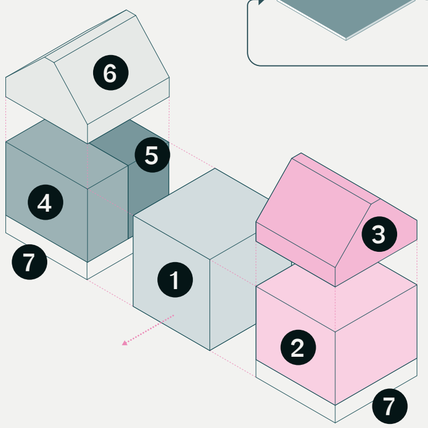






GEOMETRICAL OPTIMIZATION





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