Can plastic waste help those in need?

Plastic waste has the potential of addressing the crisis surrounding affordable housing. Despite its negative environmental impact plastic waste can be repurposed effectively. In countries struggling with waste management plastic waste is often burned or buried, leading to CO2 emissions and ecological harm. However, certain plastics like HDPE and PP possess durability and strength comparable to timber, making them ideal for construction.

To transform plastic waste into homes, we propose a three-step process: collection centers where in exchange of plastic waste the collectors are paid, followed by transportation to manufacturing hubs where it is cleaned, shredded, and converted into plastic sheets and beams. Lastly the beams which feature a disassembly-oriented design with four rails, enabling easy insertion of plastic sheets become homes.

This system offers a solution to the urgent refugee crisis in Ecuador, providing rapid, affordable housing for Venezuelan refugees. Additionally it can be implemented worldwide to address various humanitarian crises that require temporary housing. With plastic waste available globally, this innovative approach can help those in need of shelter.

Challenges addressed from the Planetary Plastic Pavilion: 1,2,3,4,5

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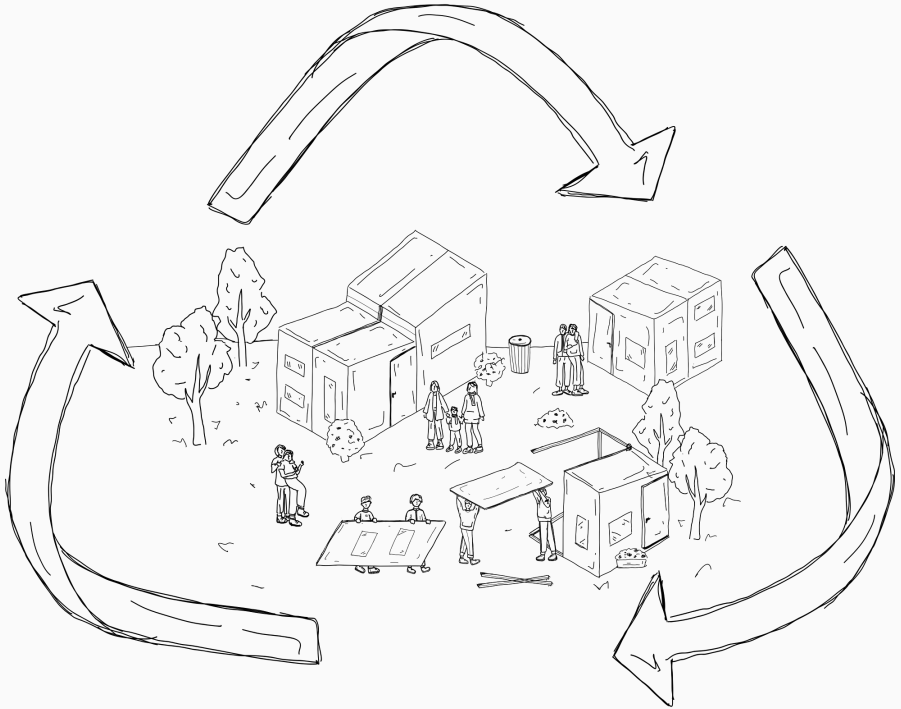
Can plastic waste help those in need?

A proposal to turn plastic waste into affordable housing



Plastic Pollution

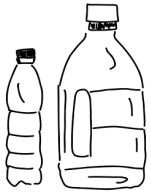
The majority of plastics produced worldwide become waste, which is a serious worldwide issue

This waste affects habitats and natural processes, limiting ecosystems' ability to cope with climate change and harming the livelihoods and well-being of millions of people.

Types of plastic

PET

Polyethylene Terephthalate



Easy to Recycle

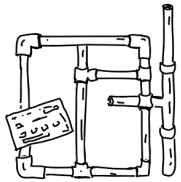
HDPE

High-Density Polyethylene

Elected plastic for building the plastic house

PVC

Polyvinyl Chloride



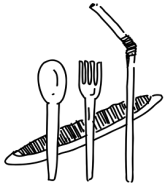
LDPE

Low-Density Polyethylene

Possible to Recycle

PP

Polypropylene



PS

Polystyrene

Difficult to Recycle

O

Other Polycarbonate Acrylic Polymethyl Methacrylate

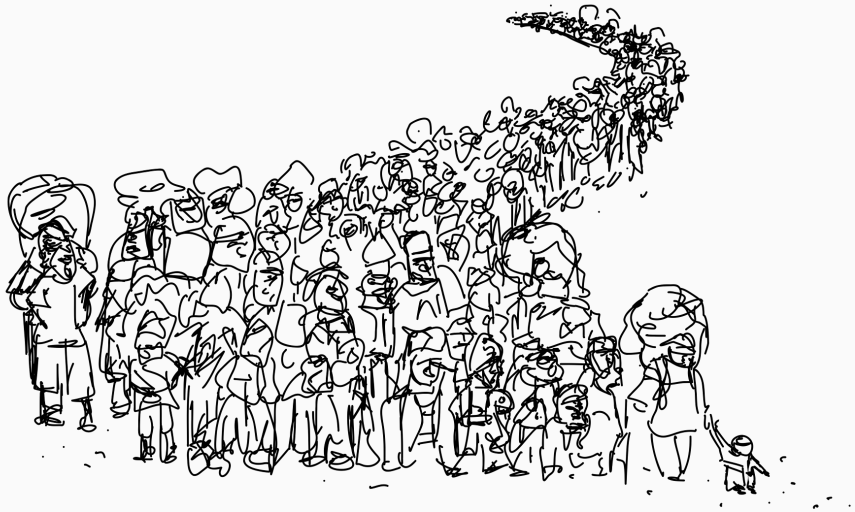
Almost Impossible to Recycle

Characteristics -

		Density Strength & Durability	Chemical Resistance	Moisture Resistance	Flexibility	Recyclability	Food-Grade Approval	UV Resistance	Transparency
	High-Density Polyethylene	*	*	*	*	*	*	*	
	Low-Density Polyethylene	*	*	*	*	*	*		*
	Polypropylene	*	*	*	*	*	*	*	
	Wood	*	*	*	*	*	*	*	

WHY

Are we turning plastic waste into affordable housing?

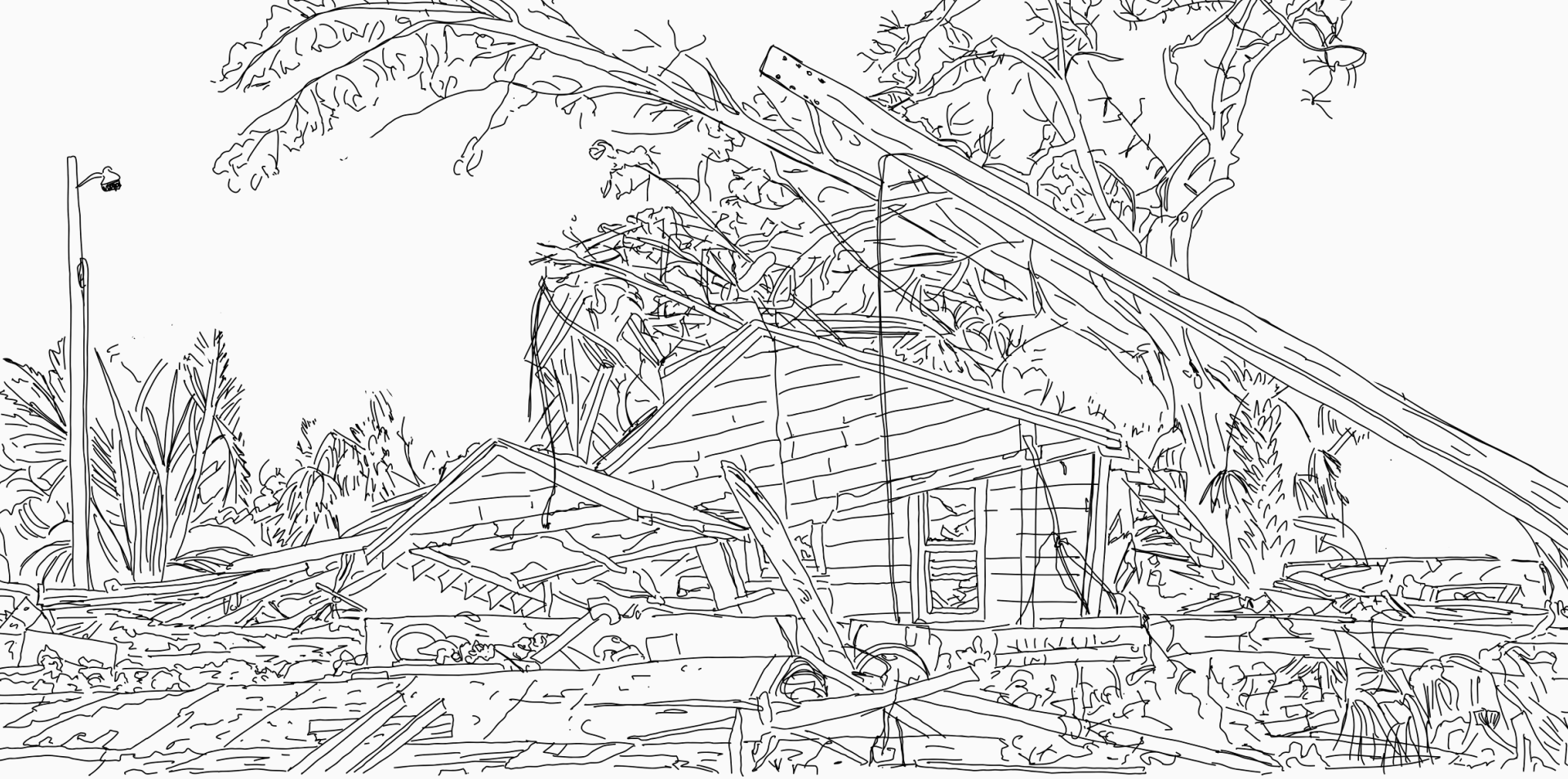


Design for the ones in need

Modular homes made from recycled plastic

Poverty

¨ Housing is the key to reducing intergenerational poverty and increasing economic mobility. Research shows that increasing access to affordable housing is the most cost-effective strategy for reducing childhood poverty and increasing economic mobility ¨



Natural disasters

¨ There is a need For Housing Following Natural Disaster…. victims of disasters and conflicts are often exposed to grave human rights violations, invariably including the right to adequate housing ¨

Refugees

¨ According to UN figures, a record 103 million people were forcibly displaced around the world in mid-2022, of whom about 37 million were refugees or asylum seekers. ¨

SITE

Venezuelan Refugee Crisis in Ecuador

Total
502.2k
Refugees

People in
need
404.4k

What they need:

Jobs

Shelter

Food

Plastic waste in Ecuador

Where does plastic waste comes from?

From 2020 till 2022 United States has sent 14,988 tons of plastic waste to Ecuador

Lack of recycling culture

Private & Public Corporations

Imports from the world

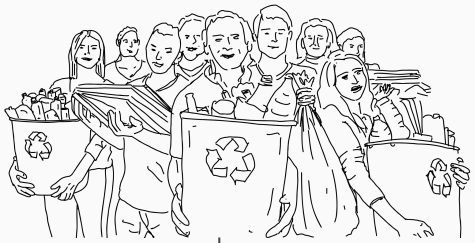
Where does it end up ?

45.7% Landfills
28.8 % Temporary cells
25.6% Open dumpsites or Ecosystems

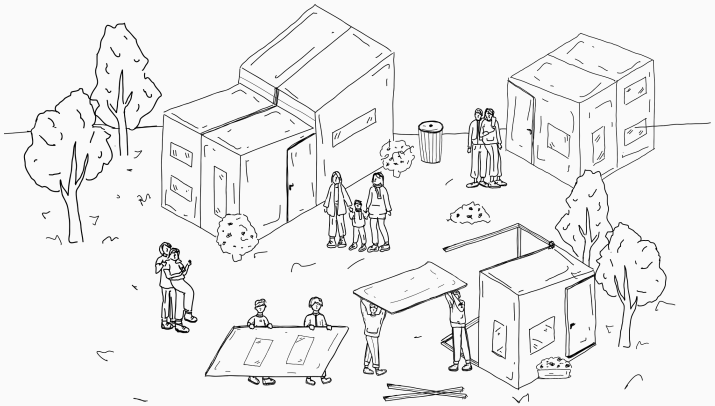
Only 4% is Recycled

Recycled Plastic Modular Homes

Collection of plastic



The flexible construction system is cheap and can easily be assembled & disassembled



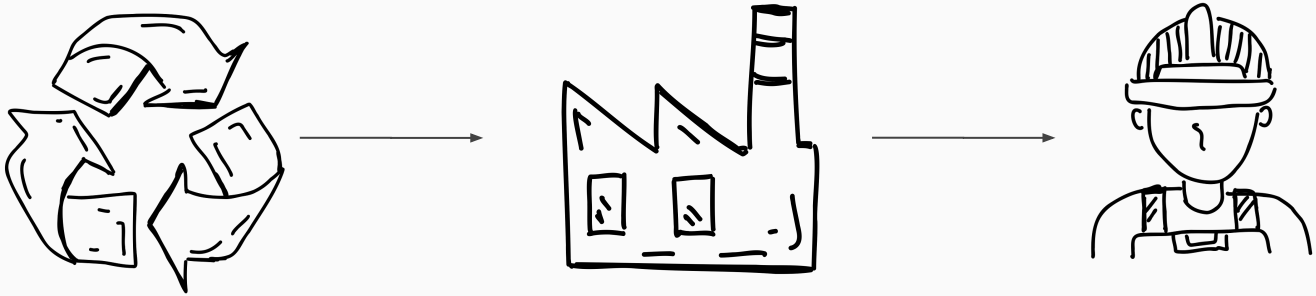
The plastic is recycled and becomes beams and sheets

HOW

Can we turn plastic waste into affordable housing?

Transforming plastic waste into homes

A three step process



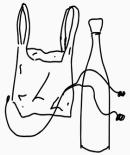
Collection point

Manufacturing hub

Construction

Collection point

Plastics with these symbols are collected



HDPE **LDPE** **PP**

The collected plastic are brought to a collection point in exchange of money

At the collection point the label is first removed, after that the plastic is cleaned

Now the plastic is ready for shredding

Manufacturing hub

SHREDDER

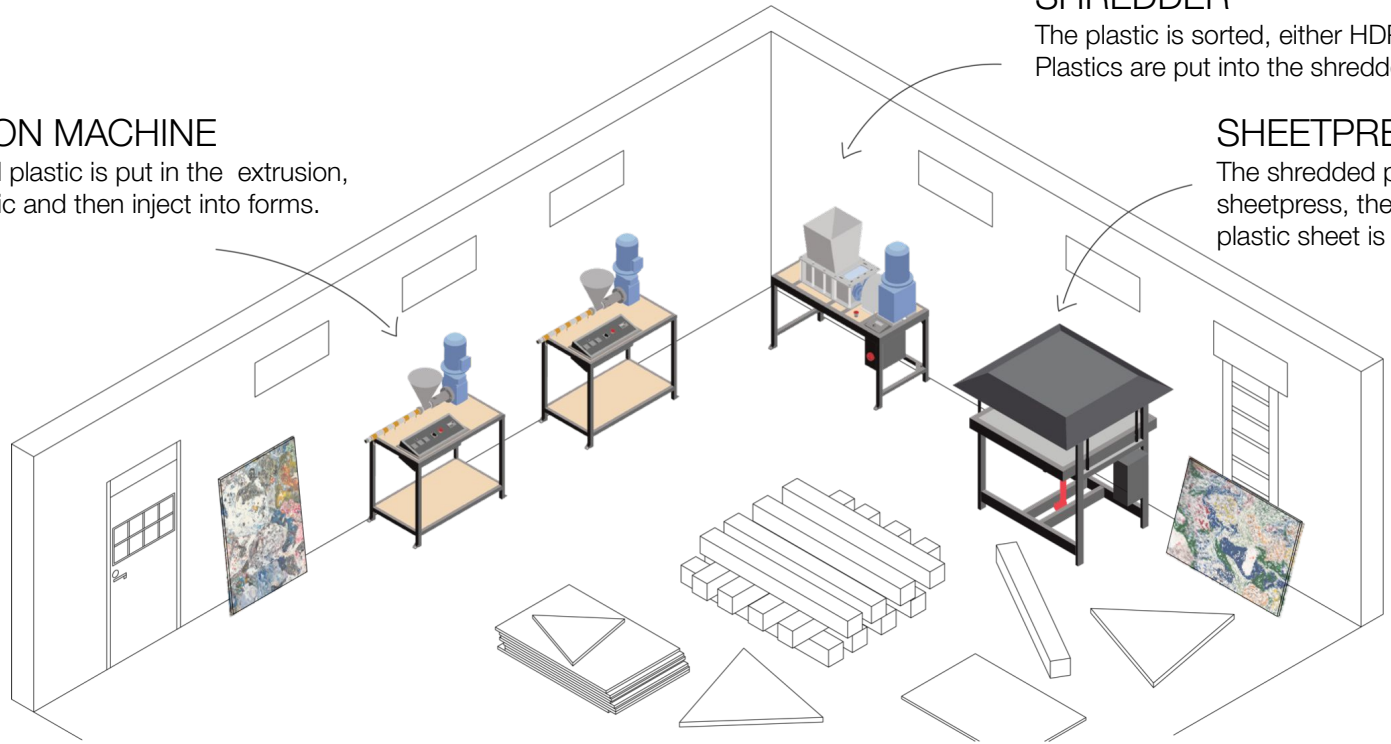
The plastic is sorted, either HDPE or PP Plastics are put into the shredder.

EXTRUSION MACHINE

The shredded plastic is put in the extrusion, melt the plastic and then inject into forms.

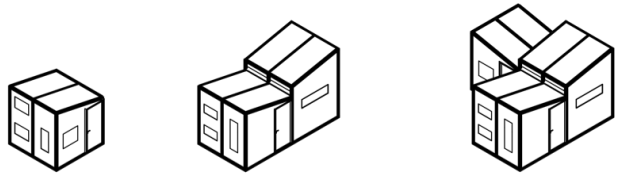
SHEETPRESS

The shredded plastic is put into the sheetpress, the plastic melts and a plastic sheet is made.

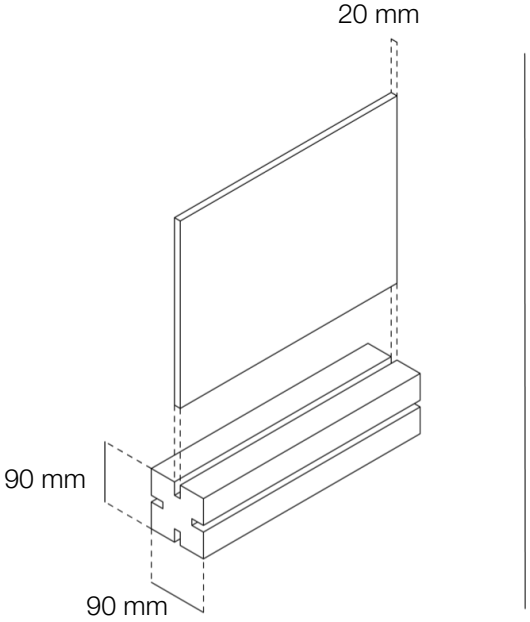


Construction

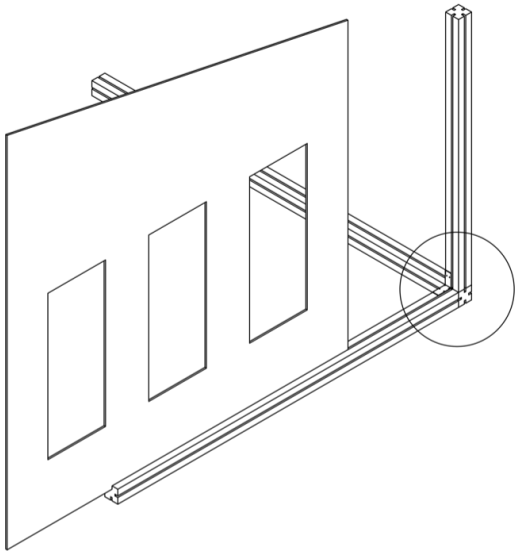
Made for disassembly



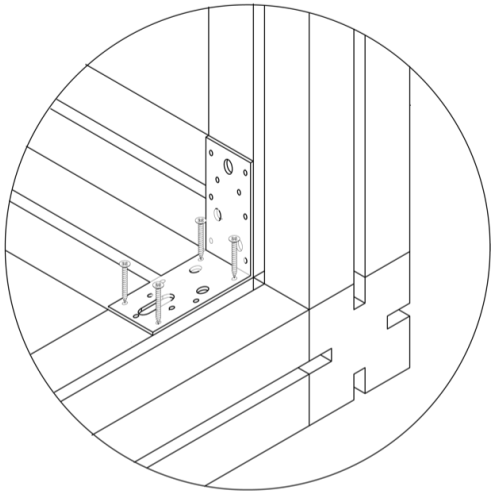
All designs follows the same construction system



A plastic beam with four 2 cm deep rails

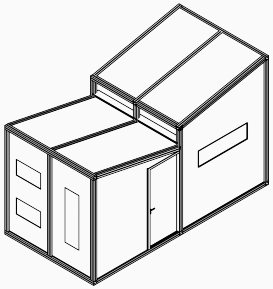


The plastic sheet is slid into the rail of the beam



Angle brackets hold the beams together with screws

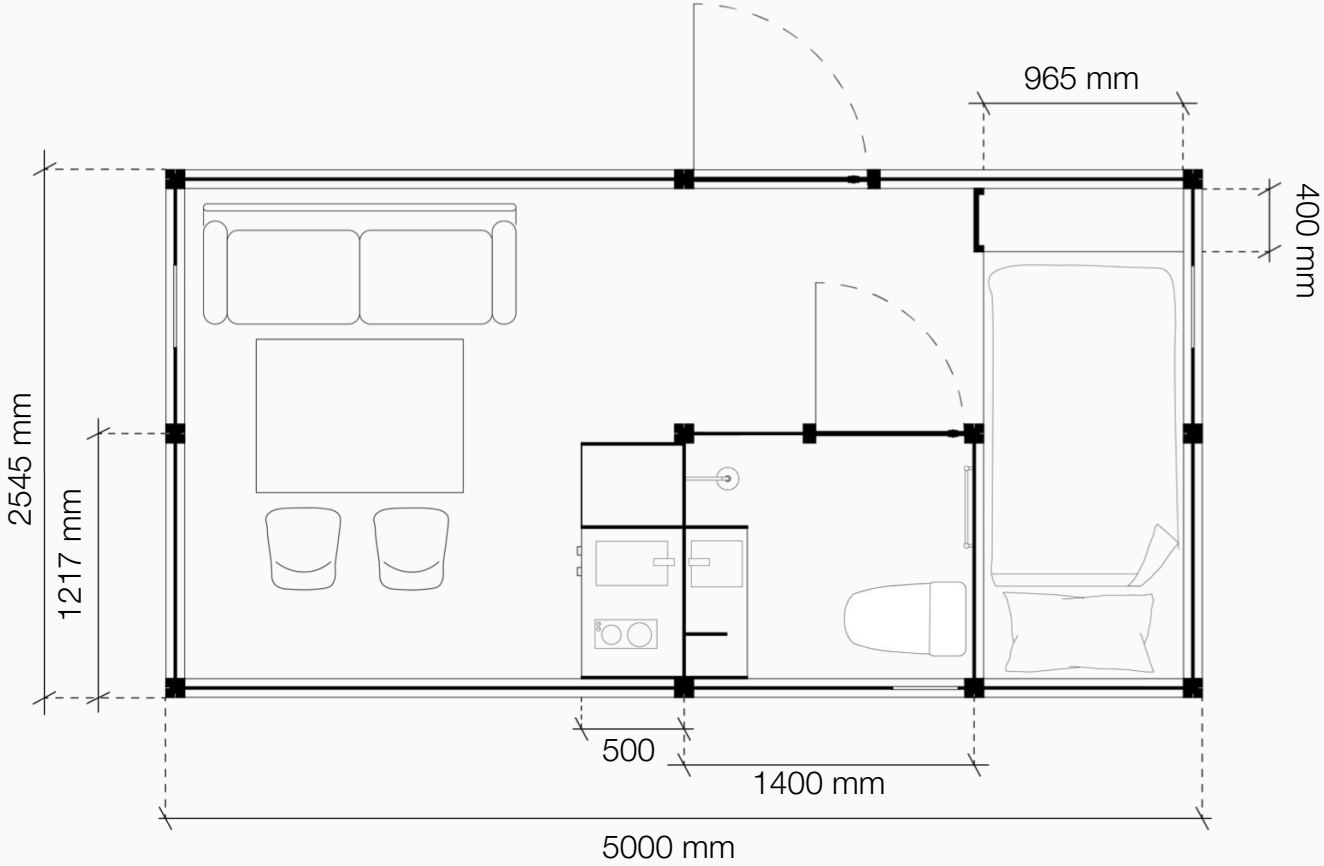
Plan of : Minimal-Unit

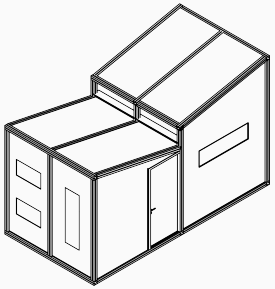


Made of recycled plastic the Minimal-unit is 12,7 square meter and have space for 4 people.

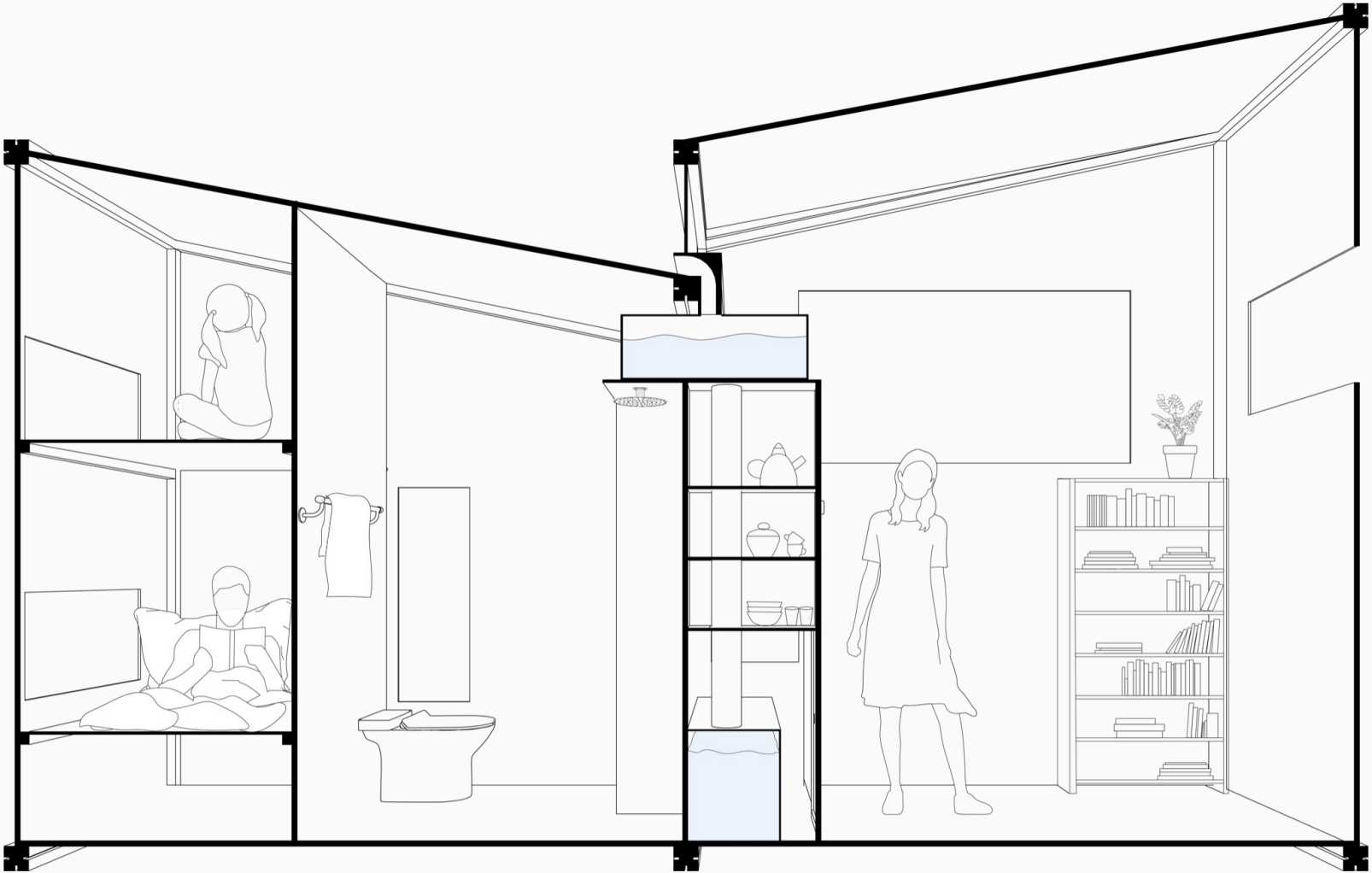
It offers a small kitchen/living area and also access to fresh water as it has a grey water collecting system on the roof.

Cost to produce: 400 Dollars





Elevations of : Minimal Unit



Community