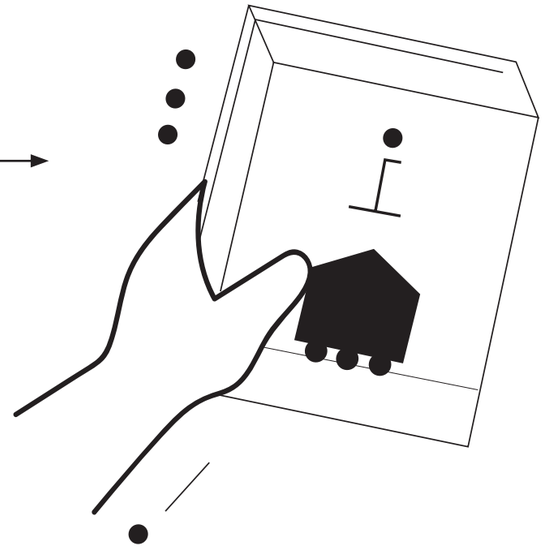
Architecture
on the move

TU Delft
Explore Lab
Marta Carvalho

PROBLEMATIC.

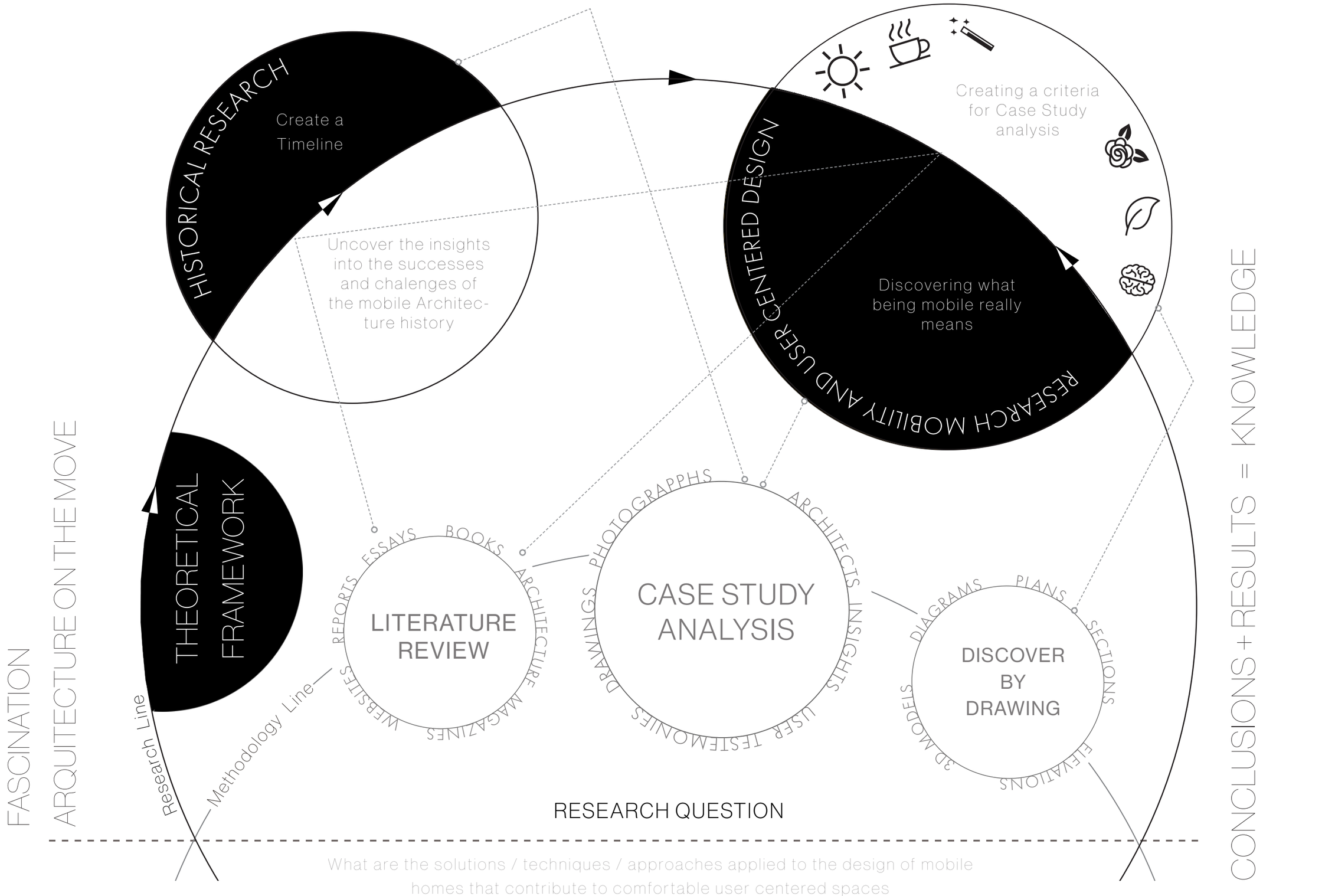
WHAT ARE THE
SOLUTIONS APPLIED IN
THE DESIGN OF MOBILE HOMES THAT
CONTRIBUTE TO THE CREATION OF
USER CENTERED SPACES ? WITH A
SPECIFIC FOCUS ON INVESTIGATING THE
INFLUENCE OF **MOVEMENT**
ON SPACE QUALITY

RESEARCH QUESTION



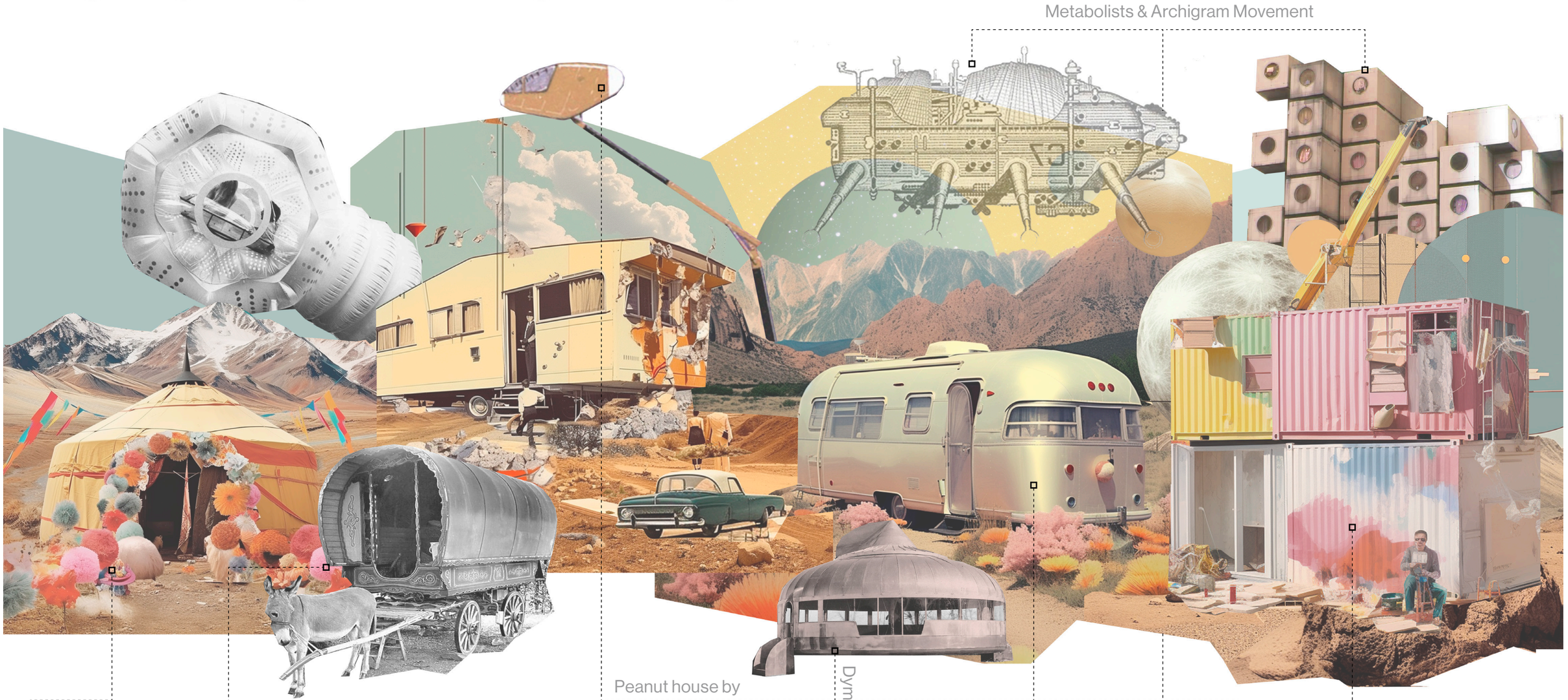
RESEARCH GOAL

METHOD.



BOOKLET PAGES : 20-21

HISTORICAL RESEARCH.



Metabolists & Archigram Movement

The Yurt

Irish Travelers Wagon

Manning Colonial cottage

Peanut house by Future systems

Dymaxion House

Airstream

Tiny house movement

Ancient Tribes

The Tipi - North America

The Black Tent - North Africa

The Caravan Club 1907 UK

Arthur Sherman Covered Wagon

Space Expeditions

1800's

1833

1907

1927

1936

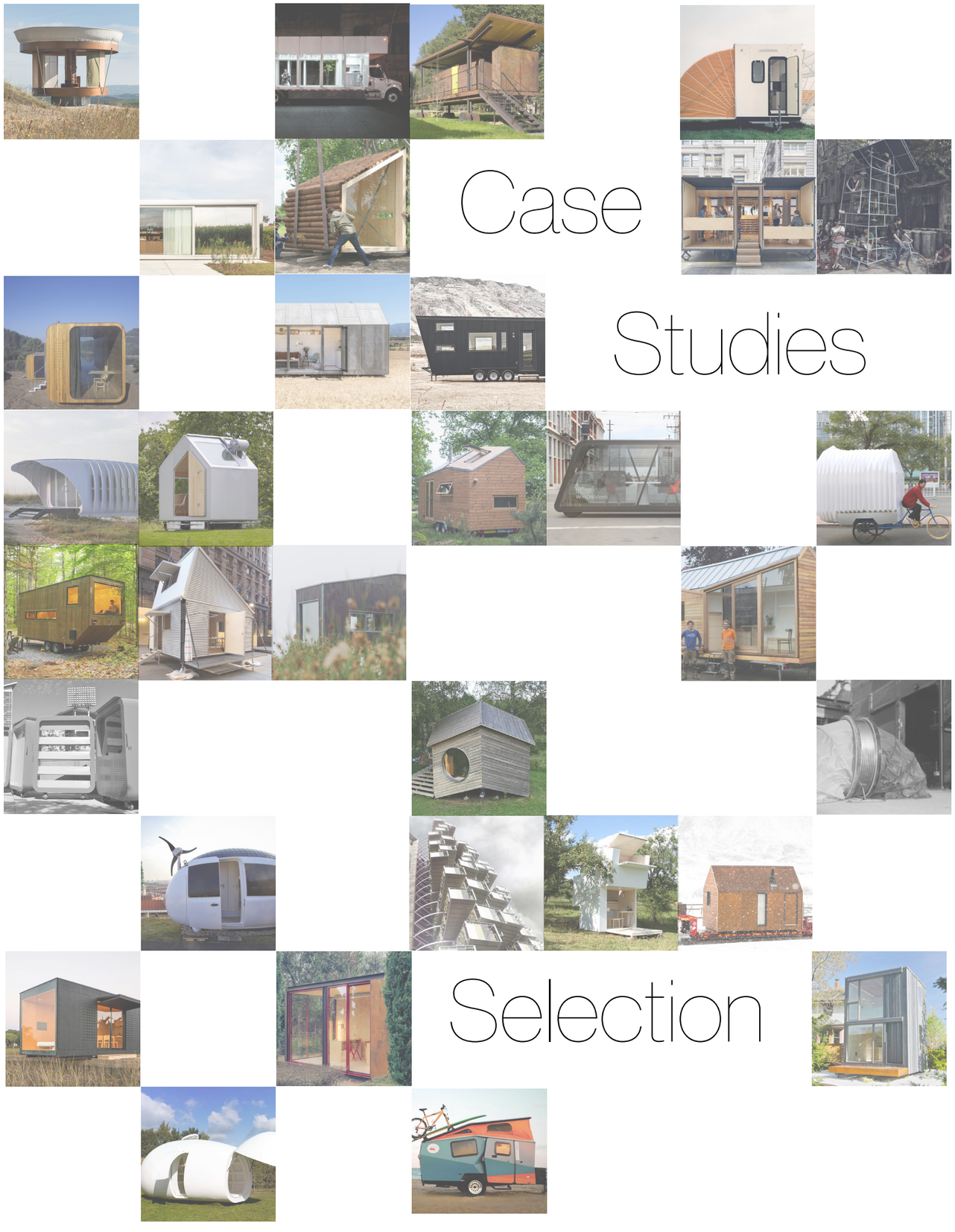
1960's

1970's

1970's -

20th Century

Digital Age



Case Studies

Selection

1. Curiosity

100 case studies

2. Paper Trail

76 case studies

3. History link

53 case studies

4. Mobility & Transport

17 case studies

goal is **10** case studies

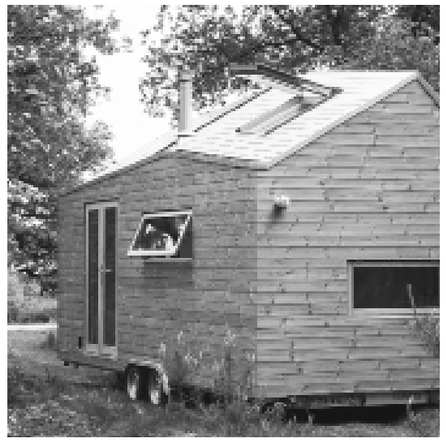
Case Studies

MOVEMENT +

THE WHEELLY

FLIP KIOSK

TRYCICLE HOUSE



TINY WALDEN

MARKIES

MDU LOT-EK

ECOBITAT

PORT-Á-BACH

SPIRIT SHELTER

CASA OJALÁ

Case Studies

LIVING +

ECOCAPSULE

ÁPH80

TINI LIVING

Case Studies

MOVEMENT +

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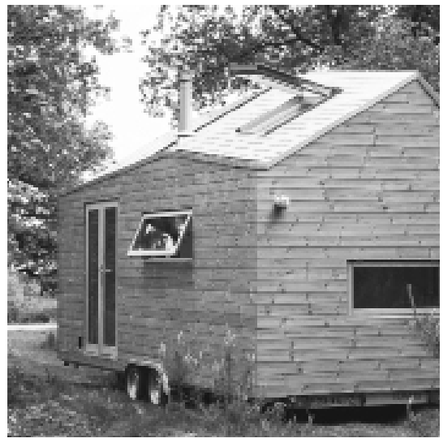
TRYCICLE HOUSE



TINY WALDEN

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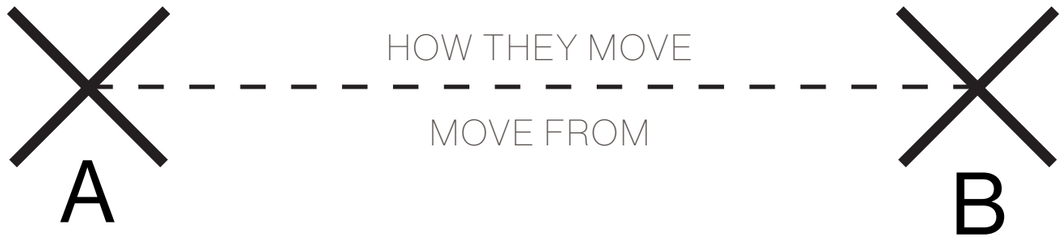
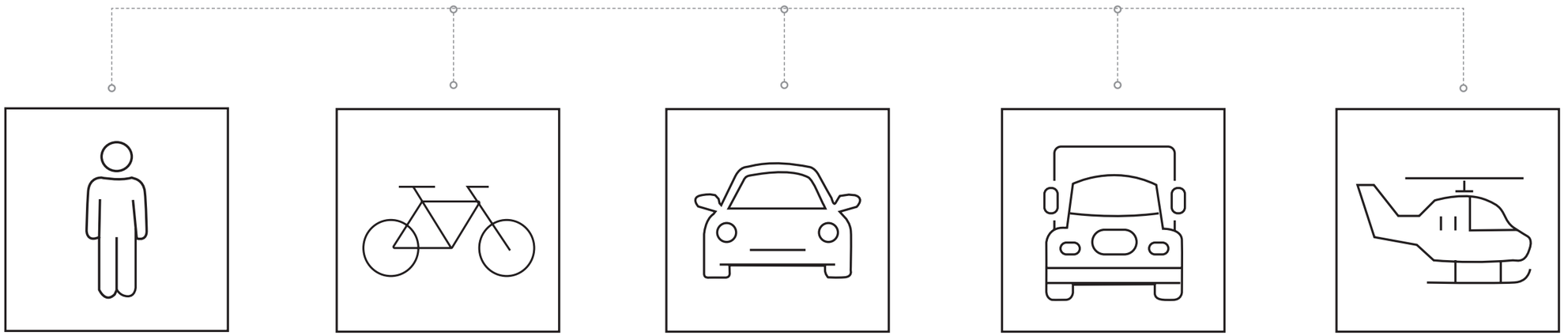
CASA OJALÁ

CASE STUDIES CHOSEN SHOWCASE DIFFERENT

TYPES OF MOBILITY





BY HAND

BYCICLE

CAR

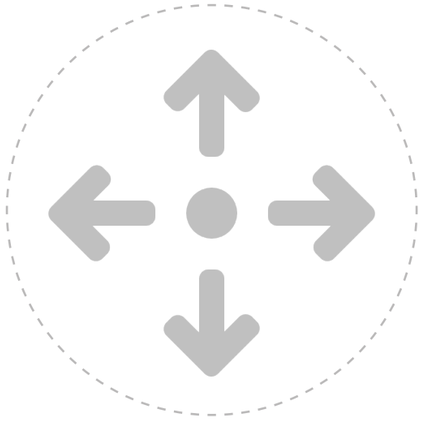
TRUCK

HELICOPTER

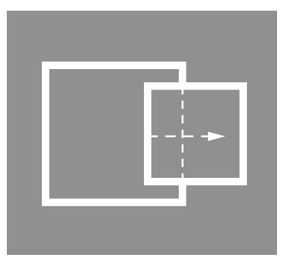
CASE STUDIES CHOSEN SHOWCASE DIFFERENT

TYPES OF MOVEMENT

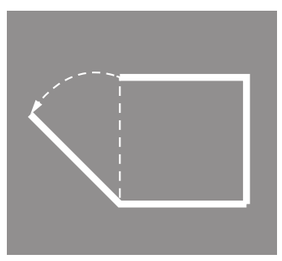
HOW THEIR STRUCTURE AND DESIGN DYNAMICALLY MOVE



MOVEMENT WITHIN THE BUILDING IT SELF

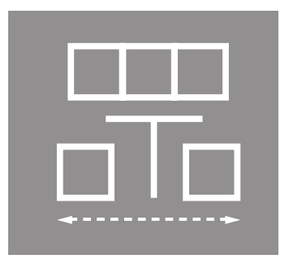


CENTRAL CORE EXTENTION



DYNAMIC OPENINGS

FOLDING STRUCTURE



MOBILE FURNITURE

BOOKLET PAGES : 22 - 27

PROBLEMATIC.

WHAT ARE THE
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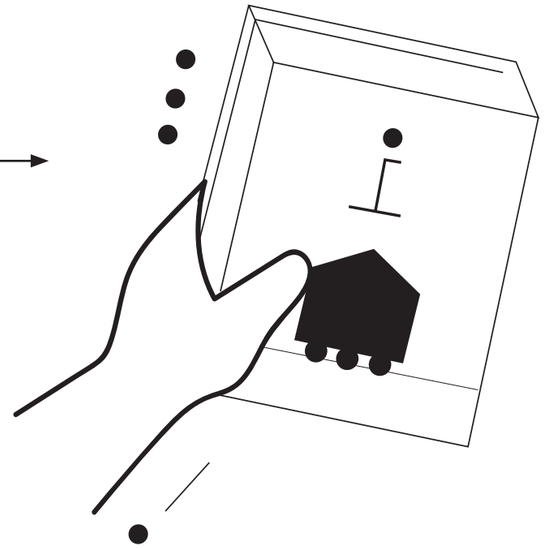
RESEARCH QUESTION



RESEARCH GOAL

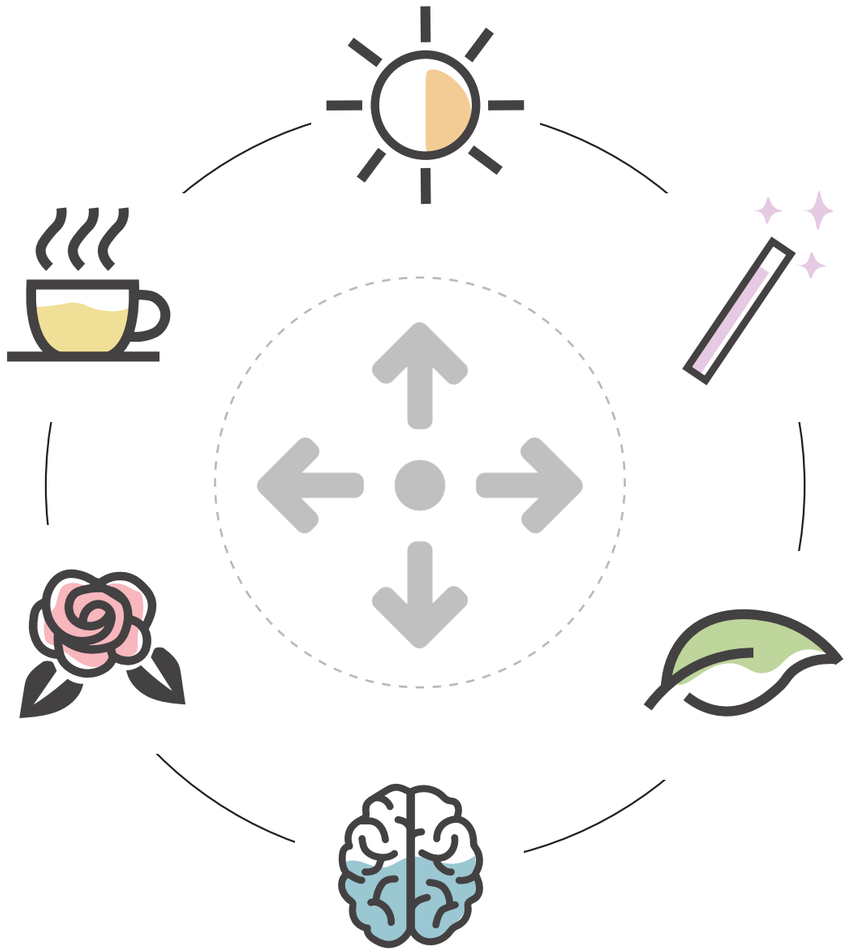
CASE STUDY ANALYSIS CRITERIA

ANALYSIS EXAMINS THE

INFLUENCE OF MOVEMENT

REGARDING THE IMPROVEMENT OF **DESIGN FUNDAMENTALS**

CENTERED AROUND USER LIVING



"HAPPY BY DESIGN" FUNDAMENTALS

BY AUTHOR BEN CHANNON

LIGHT.

COMFORT.

NATURE.

PSYCHOLOGY.

AESTHETICS.

CONTROL.

FUNDAMENTALS TO CONSIDER

DURING THE DESIGN PROCESS OF USER CENTERED DESIGN

LIGHT

Account for external shadows and building shape

Select apropriate window sizes

Use highlevel windows and roof lights

COMFORT

Use tactile materials

Maintain good room temterature

Ensure fresh supply of fresh air

Prioritize comfort over aesthetics when necessary

NATURE

Bring nature inside

Offer natural views

Utilize sustainable practices

Embrace biophilic design

Break the boundry to the outside

PSYCHOLOGY

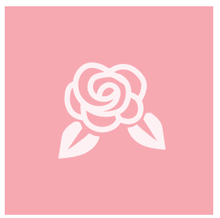
Create different Levels

Consider the importance of storage

Create open plans

Have in consideration that bigger isn't always better

AESTHETICS



Use color in a toughtful way

Avoid visual monotony

Appreciate Simplicity

Create balanced proportions

CONTROL

Create adaptable spaces

Create a diverse range of environments

Have privacy into consideration

DESIGN SOLUTION TO BE APPLIED

BOOKLET PAGES : 28-37

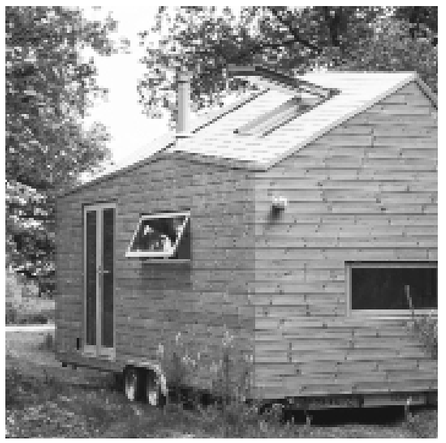
Case Studies

MOVEMENT +

THE WHEELLY

FLIP KIOSK

TRYCICLE HOUSE



TINY WALDEN

MARKIES

MDU LOT-EK

ECOBITAT

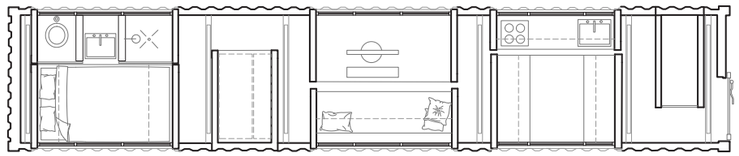
PORT-Á-BACH

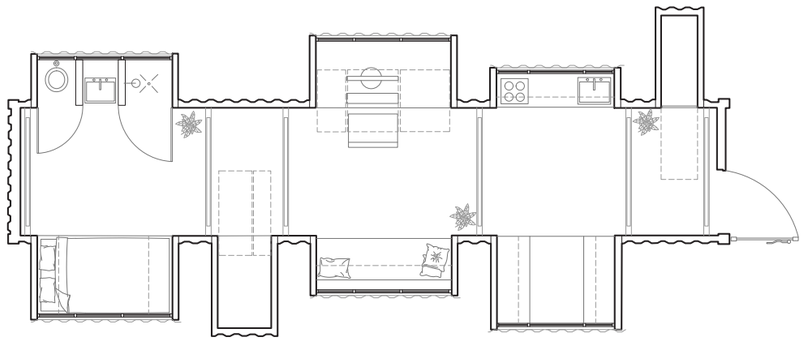
SPIRIT SHELTER

CASA OJALÁ

MOBILE DWELLING UNIT

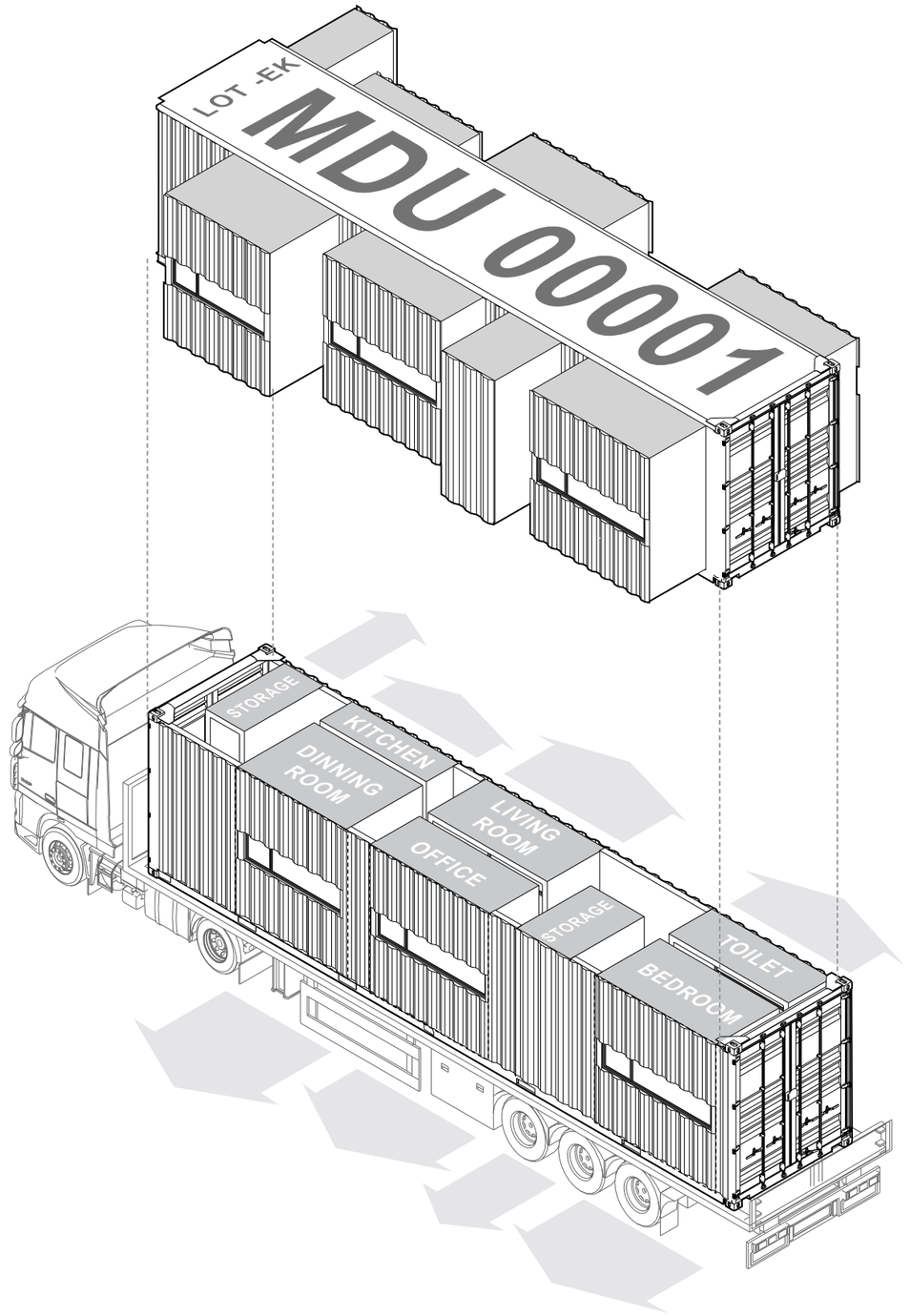
BY LOT-EK - 2003





Central core extentions

BOOKLET PAGES : 68-73

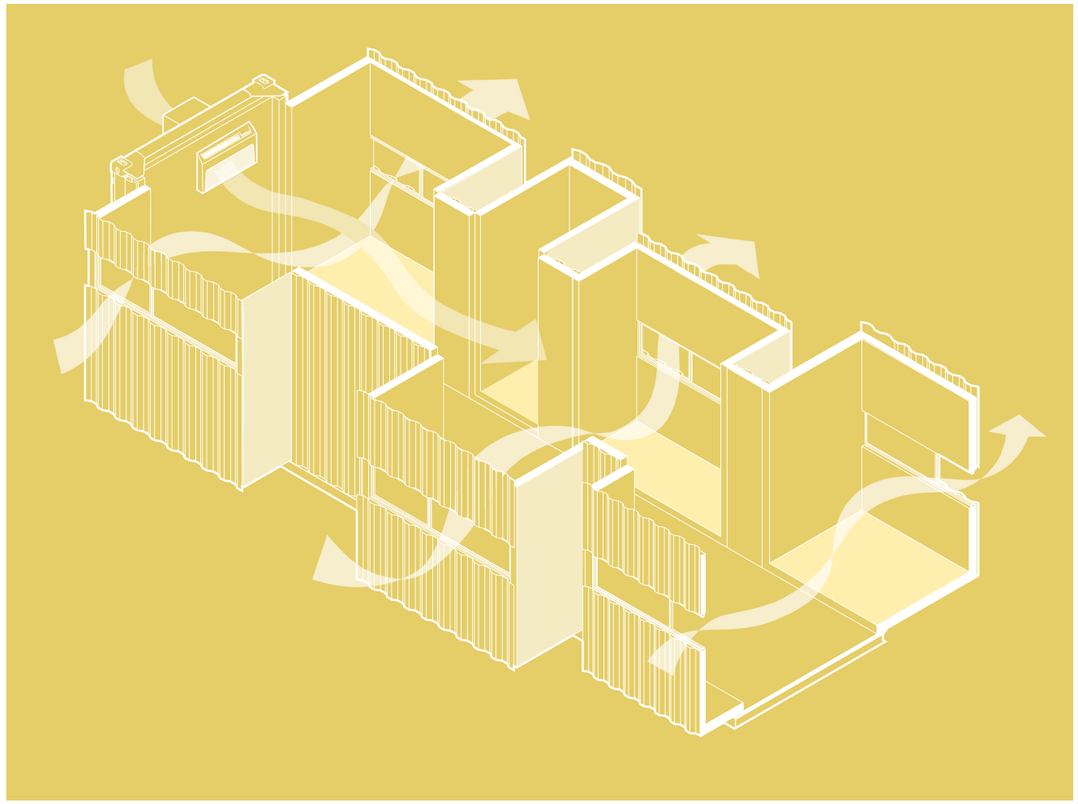


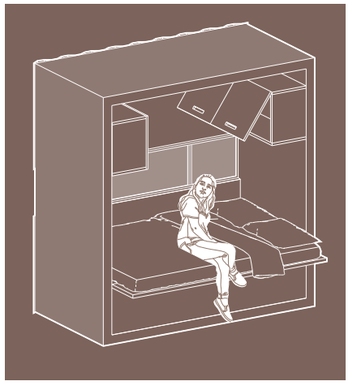
PSYCHOLOGY.

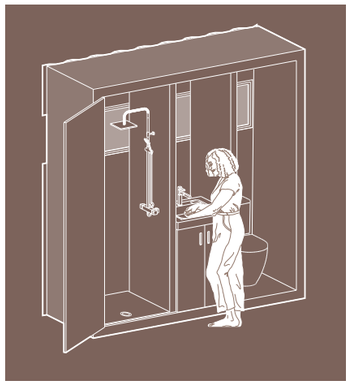
GO OPEN PLAN.

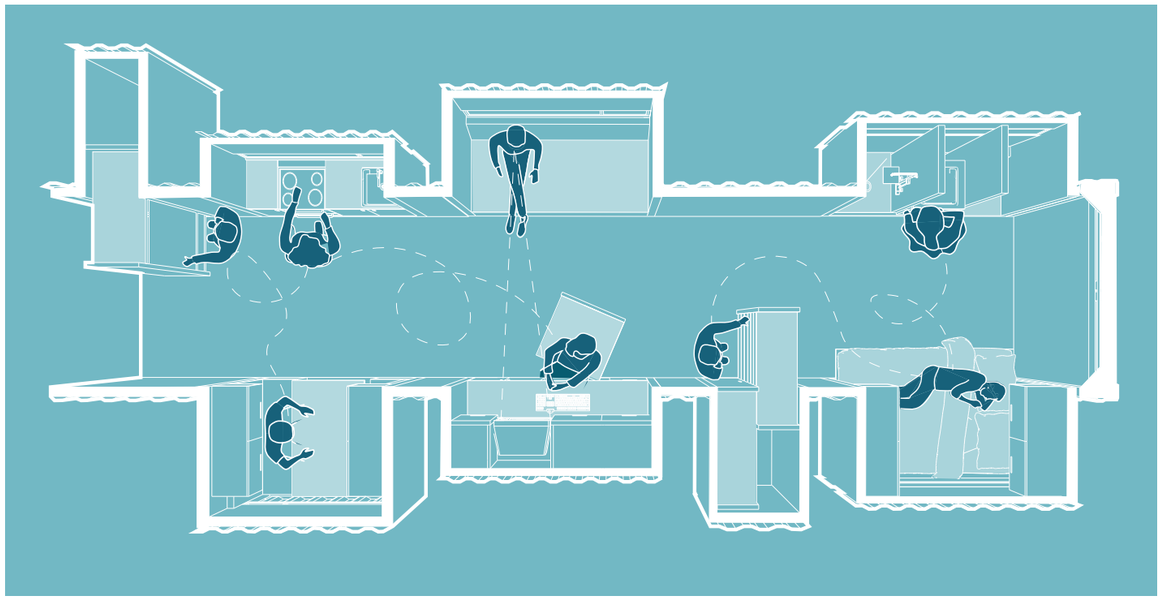
GOOD ROOM TEMPERATURE
SUPPLY OF FRESH AIR

COMFORT.



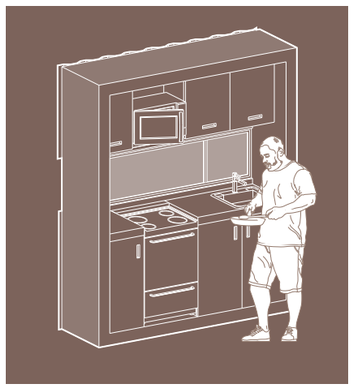


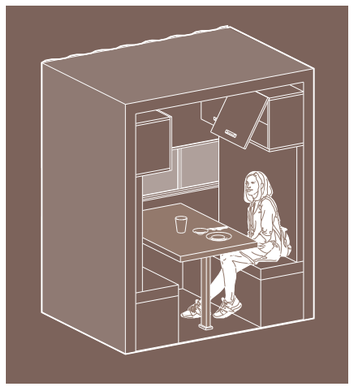


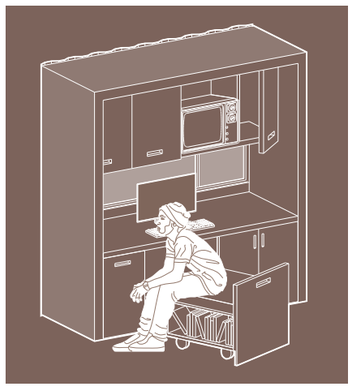


CREATE DIFFERENT ENVIRONMENTS.

CONTROL.

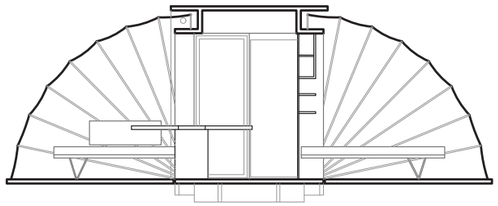


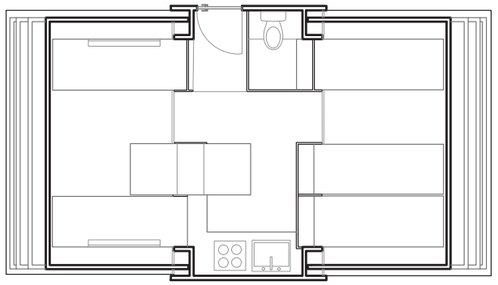




DE MARKIES

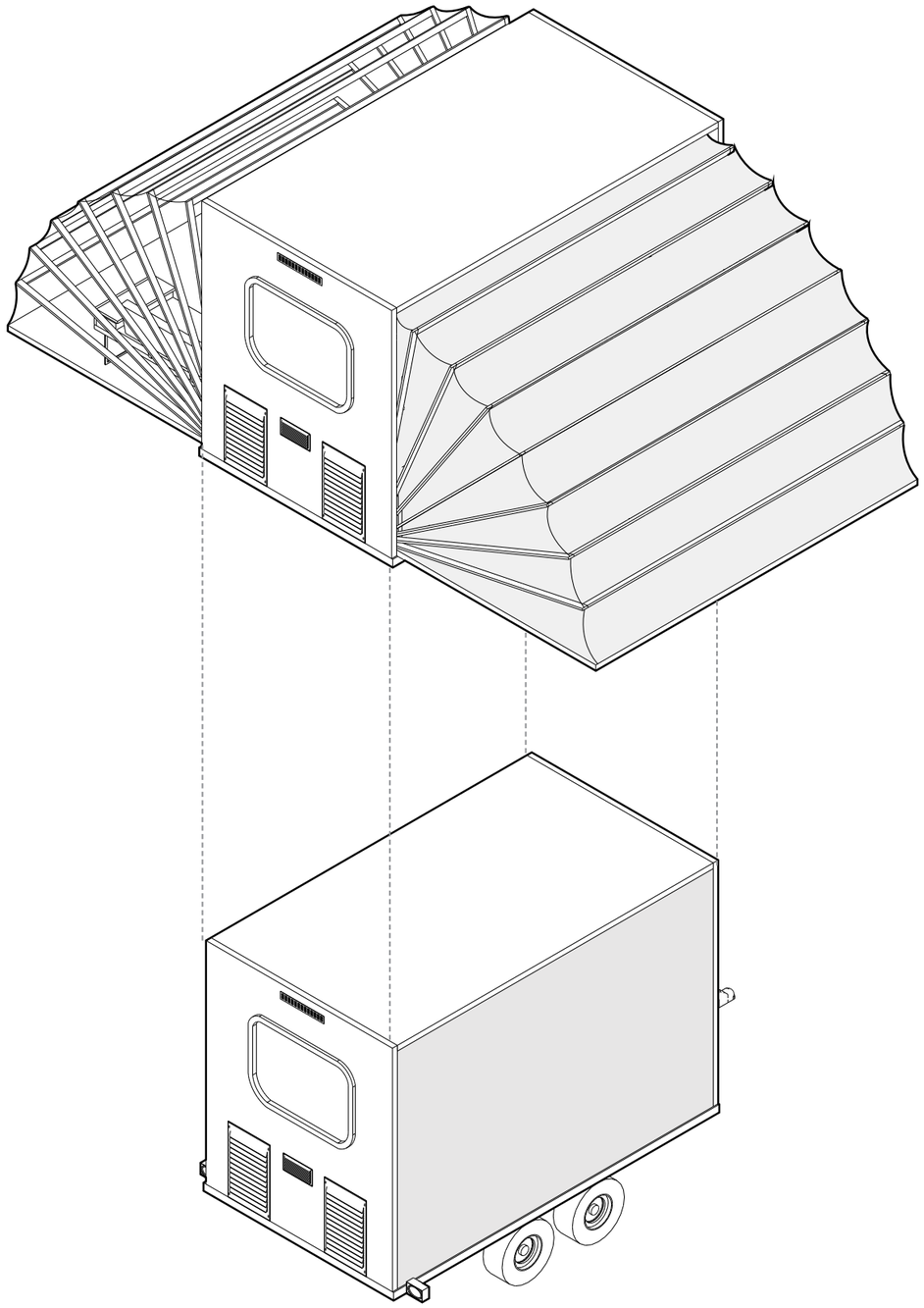
BY BÖHTLINGK - 1985

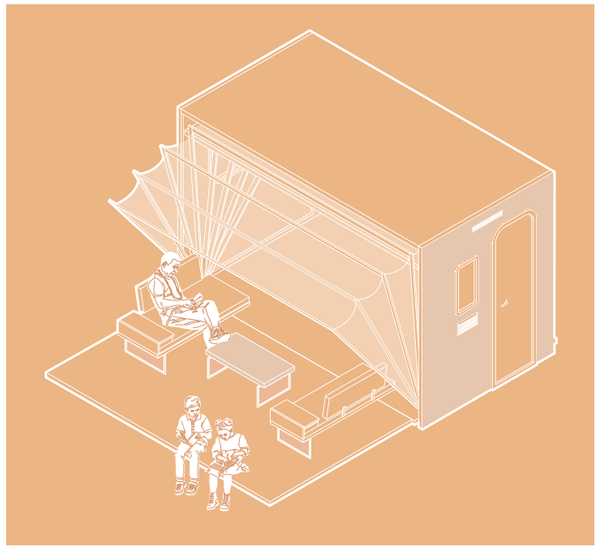


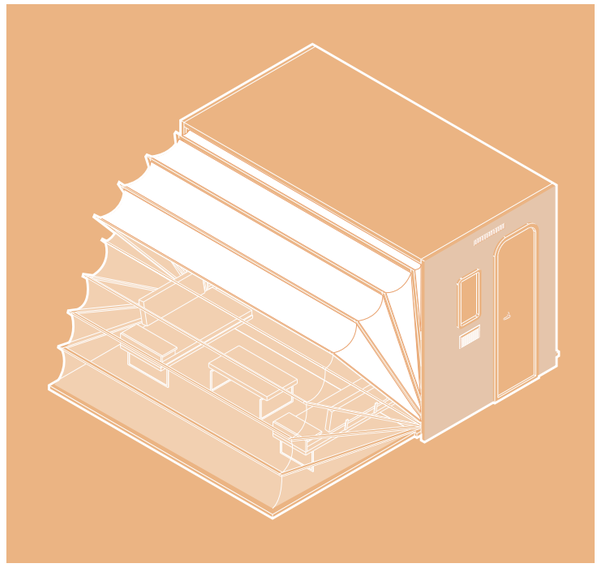


Dynamic Opening System

BOOKLET PAGES : 62-67

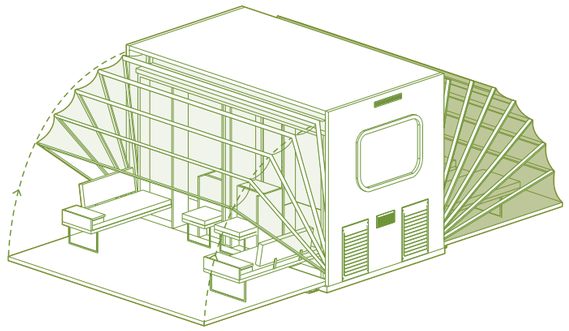




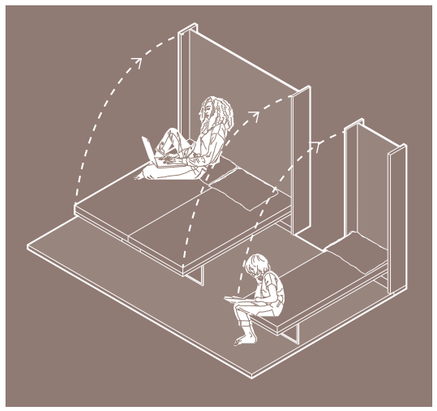


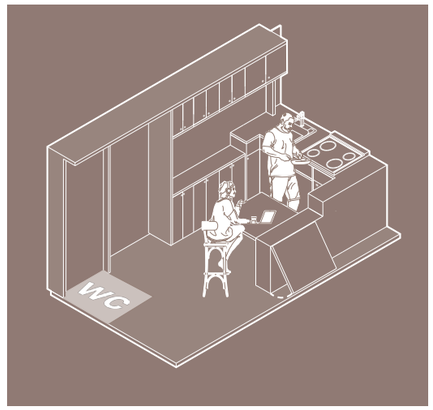
LIGHT.

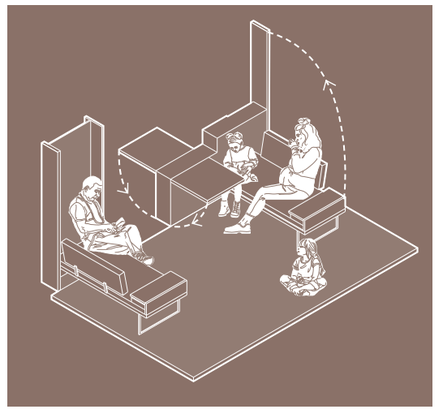
NATURE.

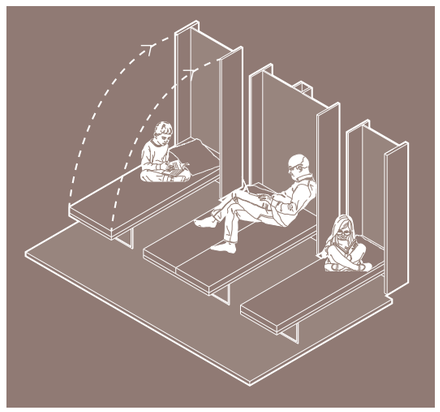


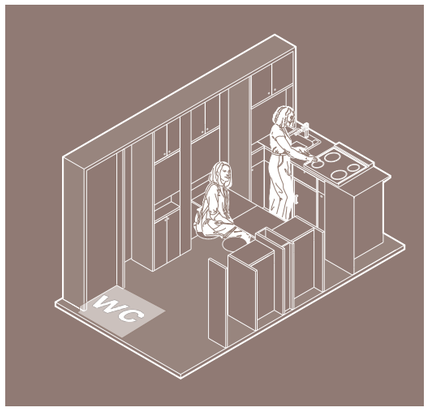
BREAK THE BOUNDRIES
BETWEEN INSIDE AND
OUTSIDE

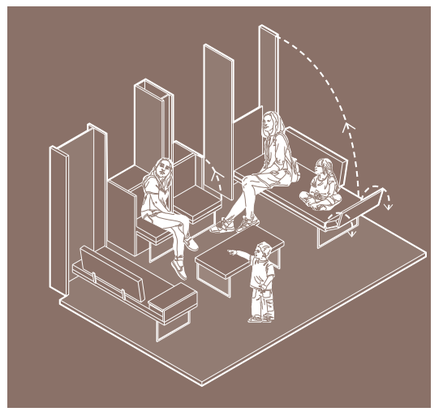












DESIGN FLEXIBLE ENVIRONMENTS

CONTROL.

Case Studies

LIVING +

ECOCAPSULE

ÁPH80

TINI LIVING

STRUCTURE.

Analyze the structural strategies, elements, and material choices employed in the presented case studies, unraveling their architectural significance and

UTILITIES.

Investigate the utility strategies in showcased case studies, dissecting the techniques applied to furnish residences with essential amenities, revealing innovative solutions.

MOBILITY.

Examine mobility aspects in the featured case studies, building transportation methods and site preparation details, revealing key considerations in construction logistics.

Case Studies

LIVING +

ECOCAPSULE

ÁHP80

TINI LIVING

Case Studies

LIVING +

ECOCAPSULE

ÁPH80

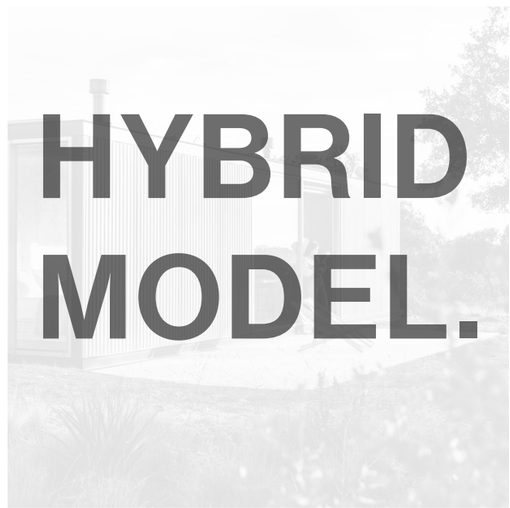
TINI LIVING

Case Studies

LIVING +

ECOCAPSULE

ÁPH80



TINI LIVING

Case Studies

LIVING +

ECOCAPSULE

ÁPH80

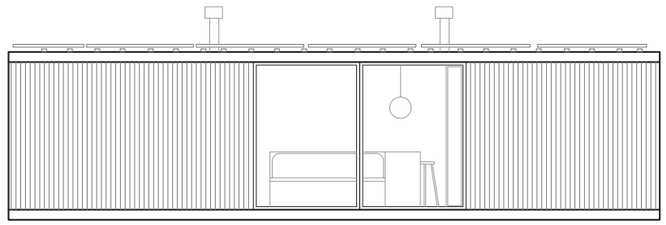
TINI LIVING

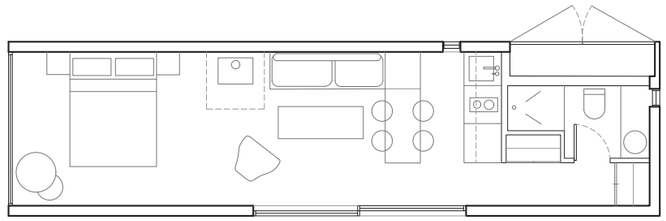
TINI LIVING

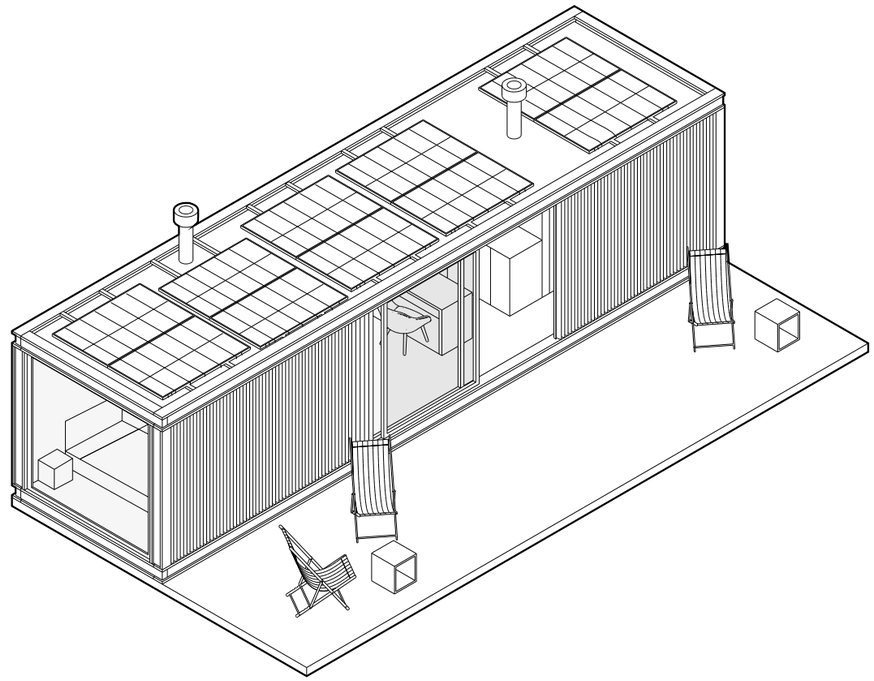
BY DELAVEGACANOLASSO

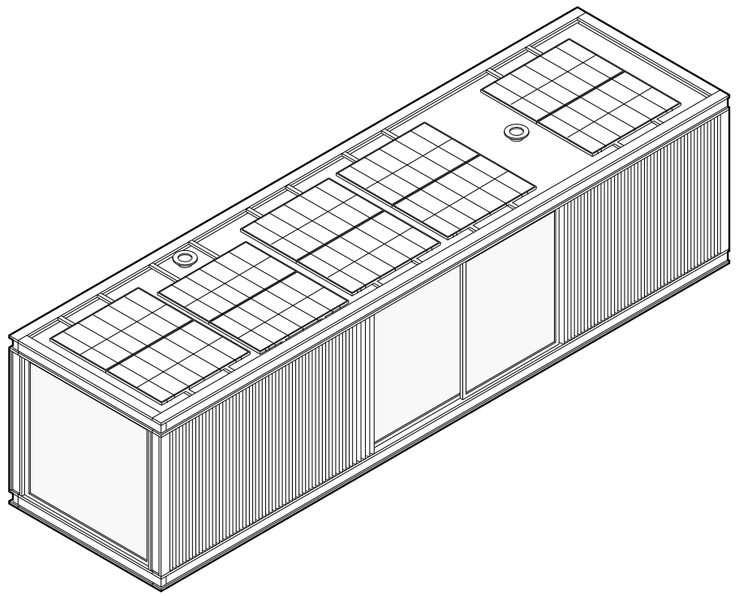
Hybrid Dwelling Unit

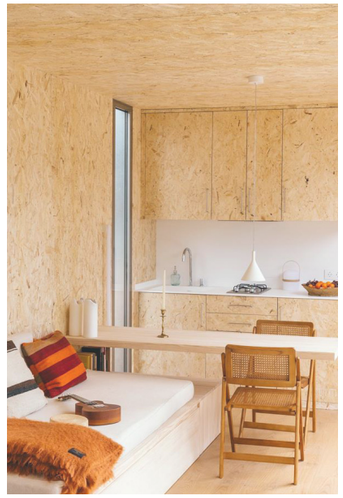
BOOKLET PAGES : 118 - 125

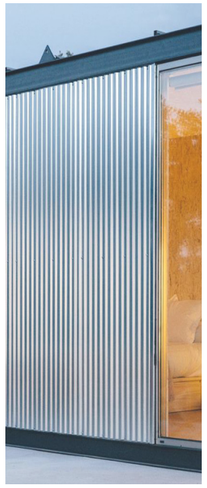




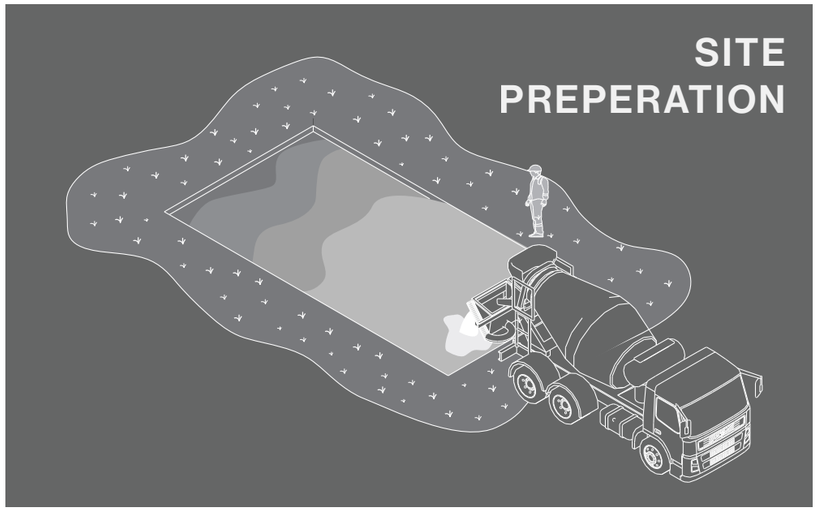


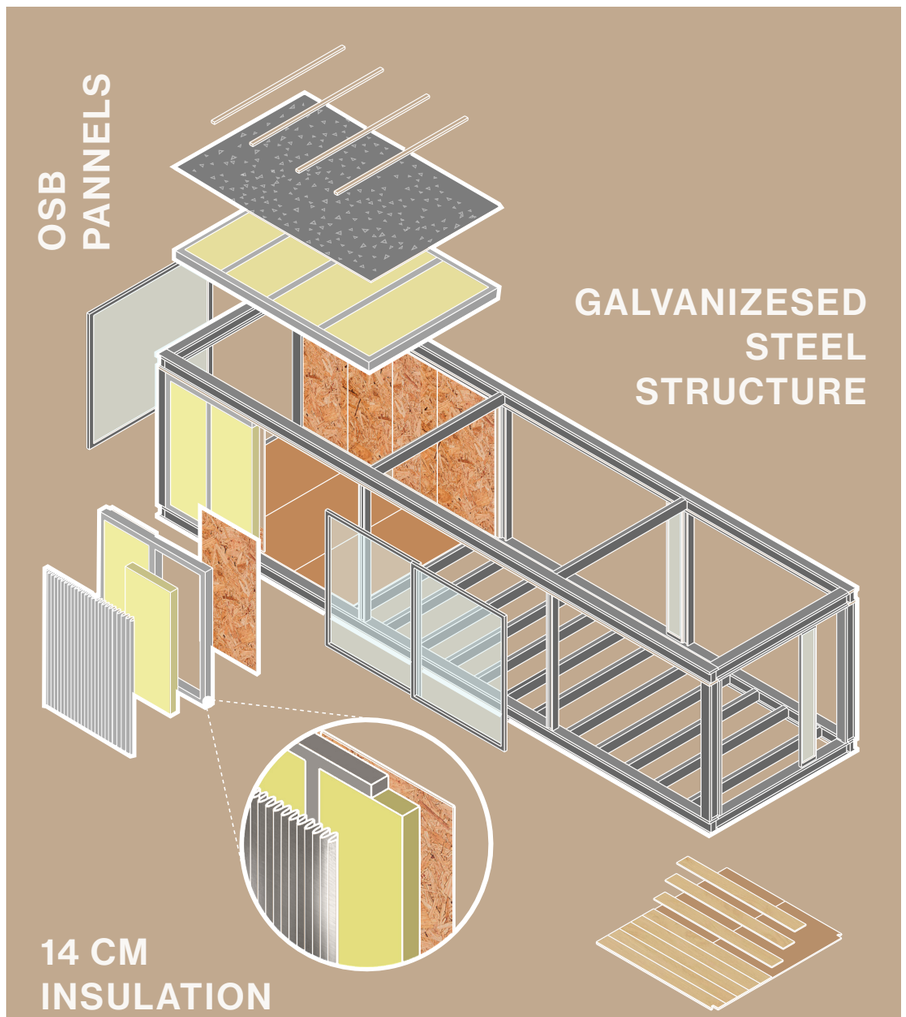




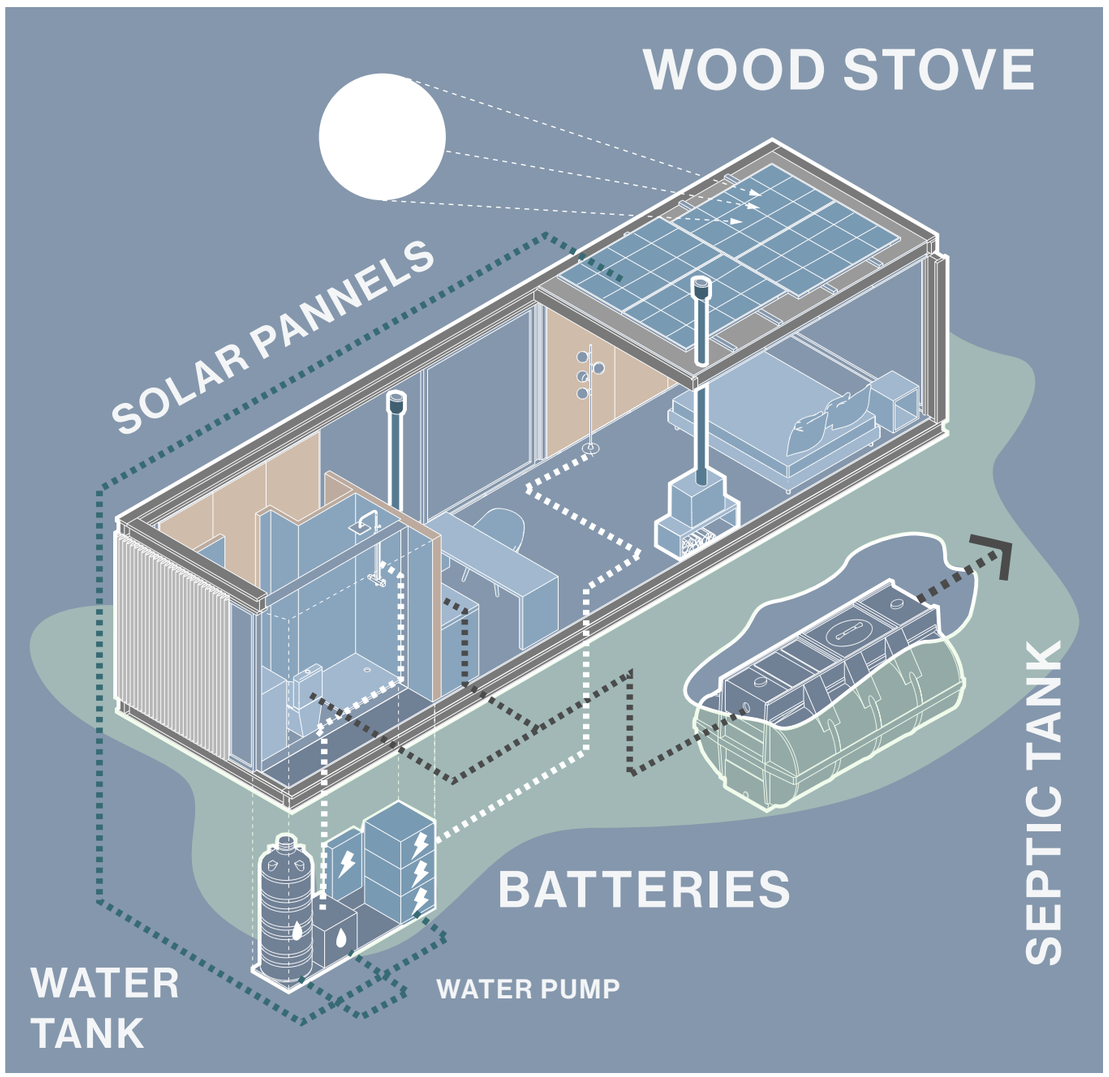


MOBILITY.





STRUCTURE



UTILITIES.

Moving + & Living +

CONCLUSIONS

BOOKLET PAGES : 126 - 137

BREAKING BOUNDRIES WITH NATURE

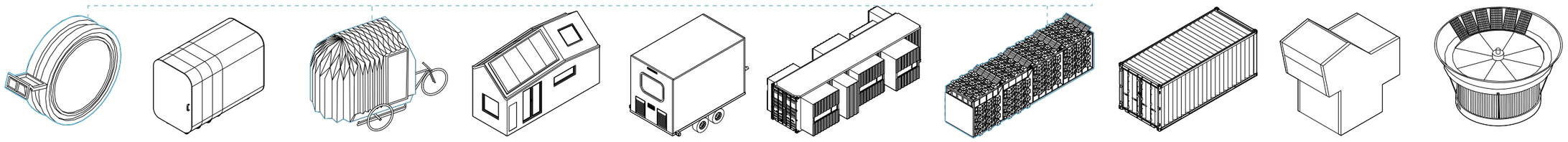
DESIGN FUNDAMENTALS

3 5 5 8 4 6

SOCIAL ISSUES SOLUTION PROJECTS

COMMUNITY FOCUSED DESIGN

WHEELLY | FLIP KIOSK | TRYCICLE HOME | TINY WALDEN | MARKIES | MDU | ECOBITAT | MDU | SPIRIT SHELTER | CASA OJALÁ



EMBRACING SIMPLICITY

HISTORICAL CONNECTION

CRITICISM

IMPORTANCE OF COMPACT MODE

PRIMARY MOVEMENTS

MIXABLE MOVEMENTS

LEVEL
OF MOBILE
FREEDOM

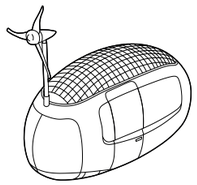
TRANSPORT

LIVING +
CASE STUDIES

OFF GRID.

Can be placed anywhere

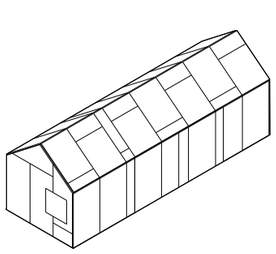
ECOCAPSULE



PLUG IN.

Urban Lots or Suburban Sites

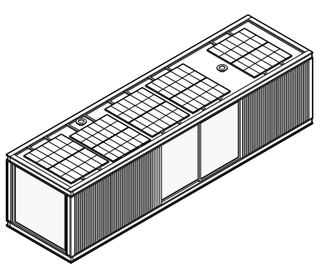
ÁPH80



HYBRID.

Urban or rural, requires truck access.

TNI LIVING



ANALYSIS CRITERIA

MOBILITY

STRUCTURE

UTILITIES

	ECOCAPSULE	ÁPH80	TNI LIVING
Preperation	No preperation (Leveling Legs make sure the capsule is straight in un-even ground)	Timber Foundations (timber blocks and piles to elevate the house 50 cm above ground level with minimal excavation).	Reinforced Slab (Concrete is poured on-site for a leveled house surface)
Shape & Size	Irregular Shape Gross Area : 8.2m2 Use Area: 6.3m2	Pitched Roof Gross Area : 26m2 Use Area: 21.1m2	Container Shape Gross Area : 34m2 Use Area: 27.8m2
Frame	Steel Skeleton	Solid Timber Frame	Steel Frame
Skin	FibreGlass	Blended timber concrete	Galvanized Steel + others
Interior	Honeycomb wood	Spanish Fir	Poplar OSB
Insulation	Foam Insulation no info	No Info 12 cm	Multiple Types 14cm XPS, multi-reflective & Recycled PET
Energy	Source: Wind + Sun Wind Turbine + Solar Pannels **Storage: 3 Batteries** Capacity 9.7Kwh	Source: City Electric Grid Arrangements need to be done with the city to provide this conections to the site.	Source: Sun + Gas Solar Panels + Generator **Storage: Batteries** Capacity: depends on usage
Water	Source: Rain + Lakes etc. Water Filtering System (Har-vest Tank + Clean Tank)	Source: City Water Grid Arrangements need to be done with the city.	Source: External Provider External company fills water tank as needed.
Waste	Waterless / Chemical Toilet Tanks clean and dispose of waste to nature.	Source: City Sewage Grid Arrangements need to be done with the city.	Normal Toilet + Sepstic Tank Septic tank separates, cleans, and disposes of waste in nature.
°C	Air-Conditioning Powered by electricity	Passive System Natural Ventilation + Insulation	Wood Stove no power needed

PRELIMINARY DESIGN.

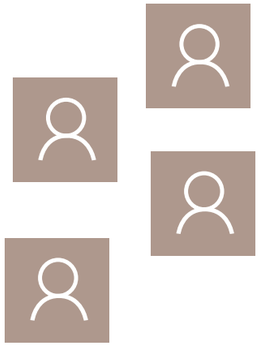
DESIGN PROCESS.

STATIC BUILDING

1

Based on the User

TARGET USER



LOCATION

DESIGN

CONSTRUCTION

& on the site Location

2

Design

3

&

Construct

4

A building that successfully fulfills the users needs

DESIGN PROCESS.

MOBILE BUILDINGS

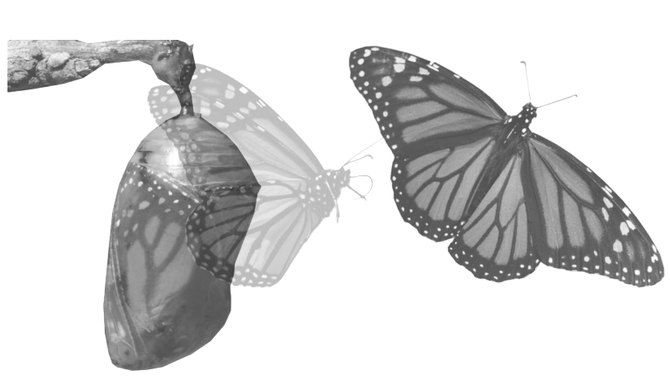
1º

DESIGN

Design a simple building

2º

TRANSFORMATION



That can be transformed

3º

CONSTRUCTION

to successfully serve

DIFFERENT TARGET USERS

and to be placed in

DIFFERENT LOCATIONS

DESIGN PROCESS.

WORD CLOUD BASED ON RESEARCH PAPER

DESIGN PROCESS.

WORD CLOUD BASED ON RESEARCH PAPER

DESIGN CONCEPT.

PROJECT GOAL

INNOVATIVE IDEA

To Develop a

MODULAR SYSTEM

Flexible and adaptable

DESIGN CONCEPT.

PROJECT GOAL

INNOVATIVE IDEA

Flexible and adaptable

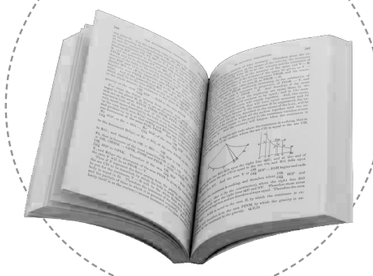
To Develop a

MODULAR SYSTEM

TEST IT

3 Different scenarios

TEST 1



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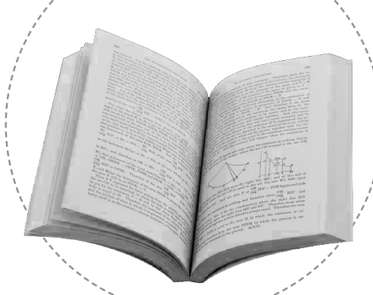

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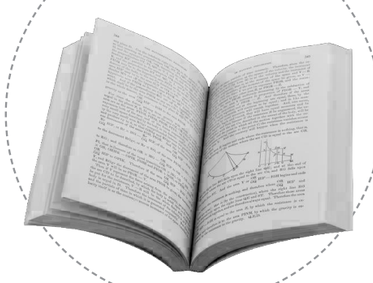


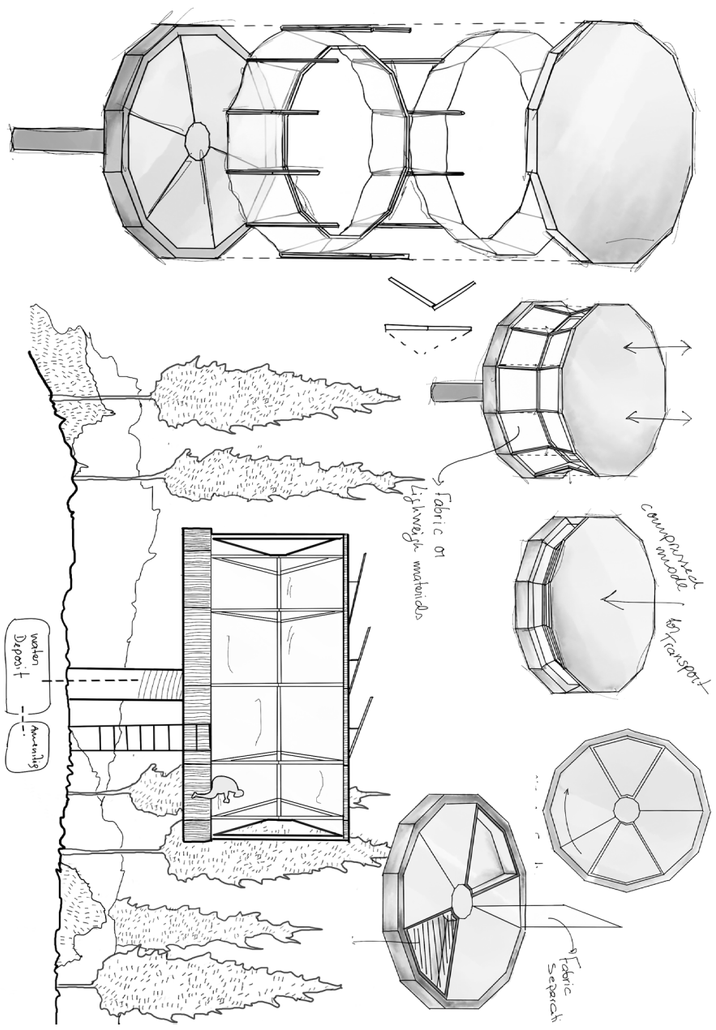
DESIGN CONCEPT.

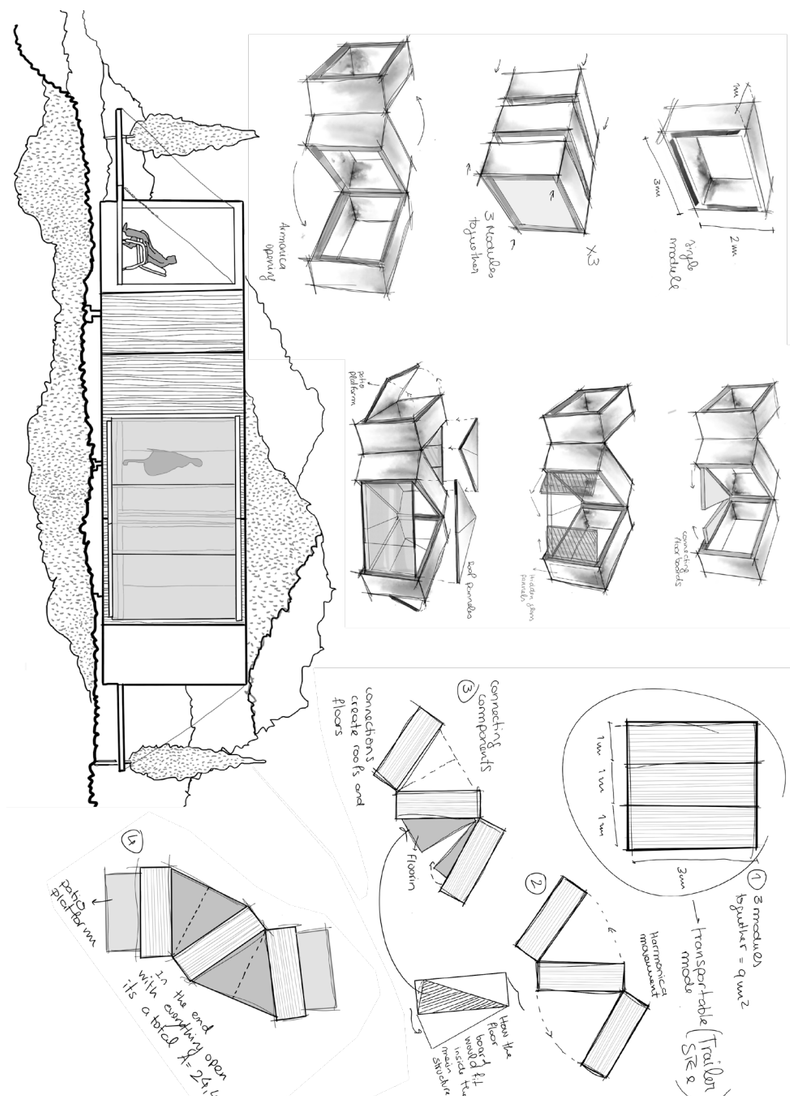
SCENARIOS

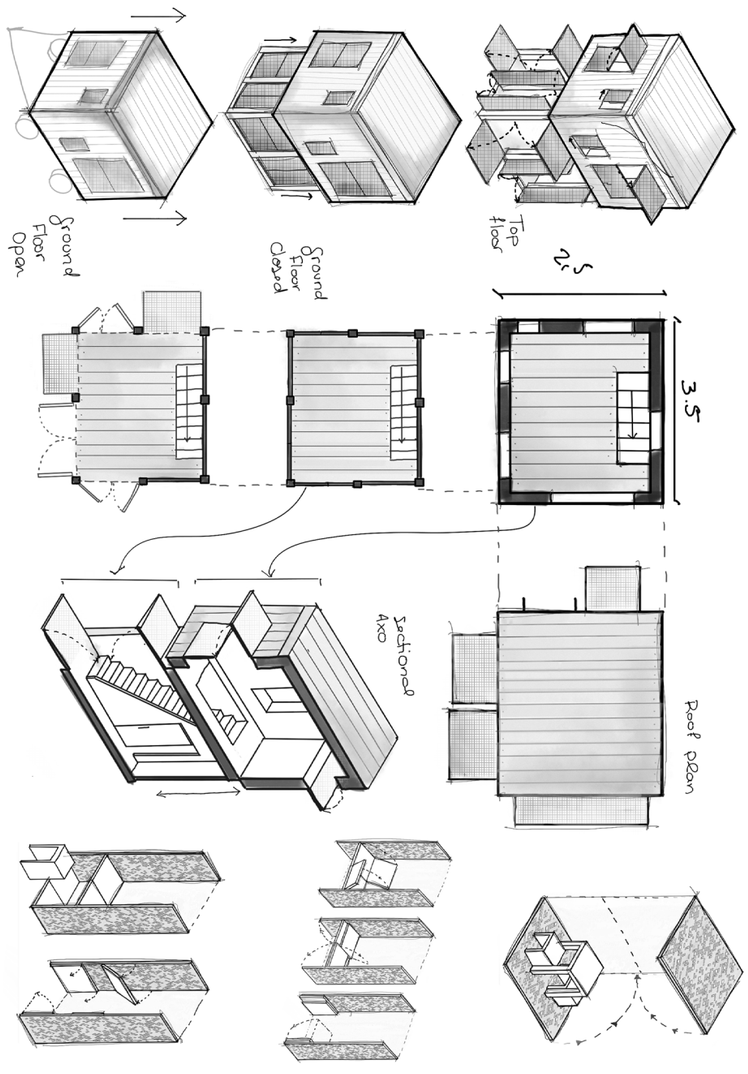
	USERS	RELOCATION	SITES	SIZE
Scenario 1	DIGITAL NOMADS	Every few weeks	Camping Sites & Caravan Parks	2.55m x 5.4m Compact size towable by car Module S
Scenario 2	TEMPORARY WORKERS	Every few Years	Urban / Suburban Countryside Owned Plots	3m x 6/12m Transpoted by Truck Module M
Scenario 3	EMERGENCY SHELTER SEEKERS	Not Defined / Depending on the demand of the emergency	Pre-Arranged Larger Site	? Larger housing complex made from the combination of Module S and M

CONCEPT COLLAGE.

SKETCHING DESIGN STAGE.







IDEA DEVELOPMENT.

IDEAS WORKSHOPED

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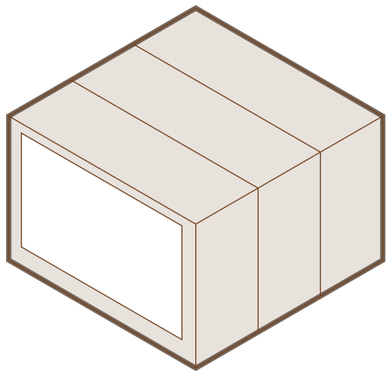
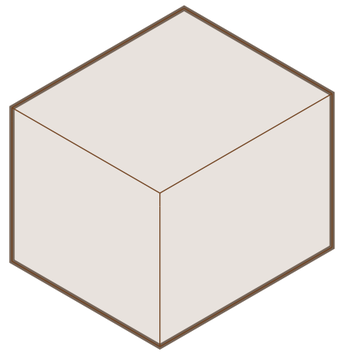


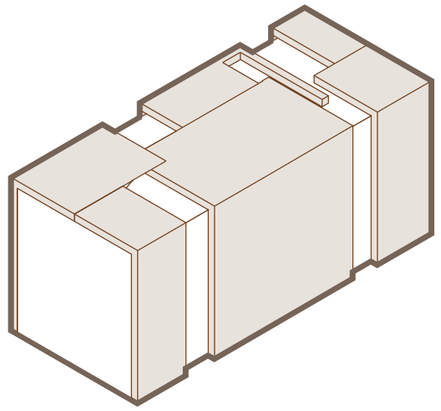
ACORDEON
HOUSE

2.



PUZZLE
BOX

3.



SPIDER
HOUSE

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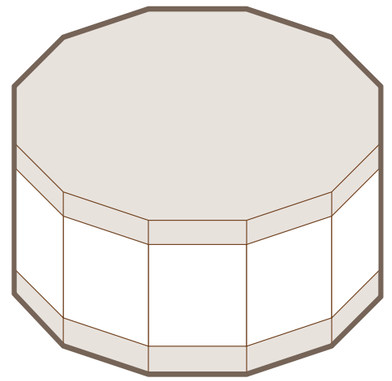

SANDWICH
HOUSE

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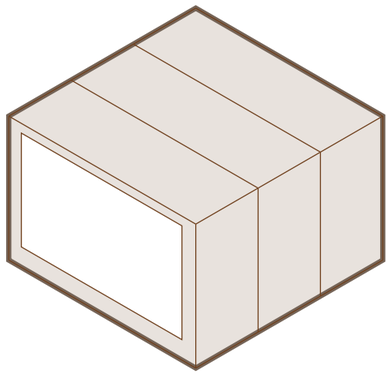

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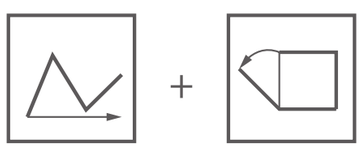

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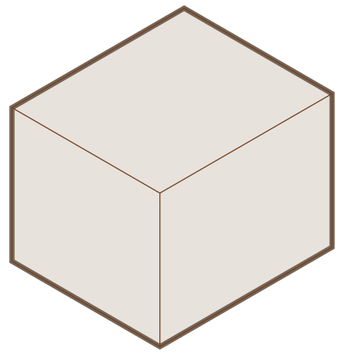

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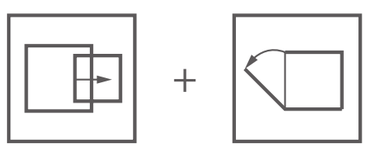

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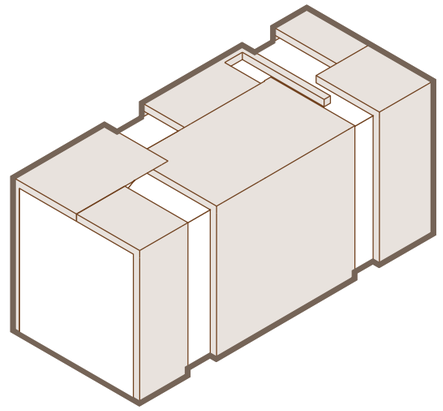

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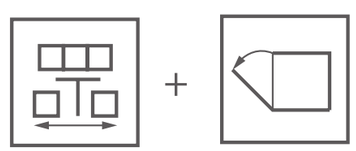

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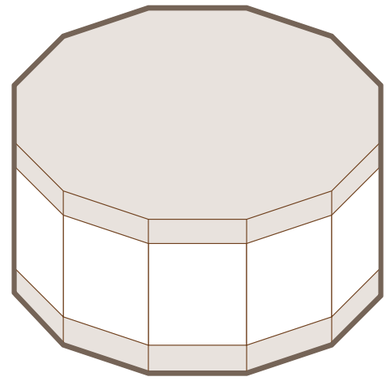

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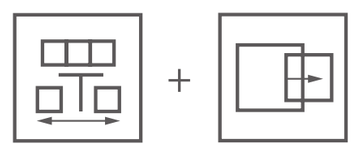

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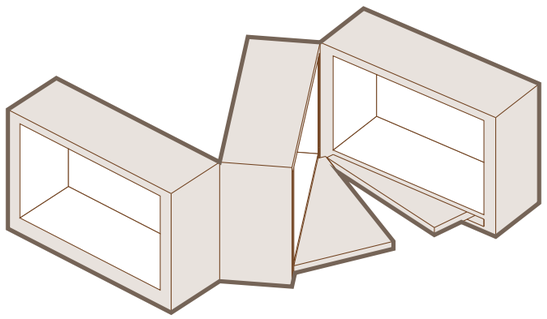

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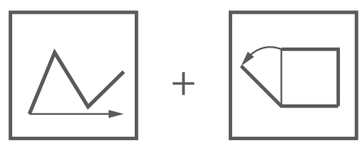

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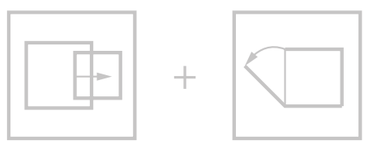

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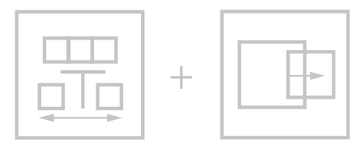

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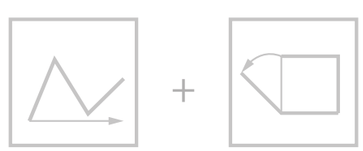

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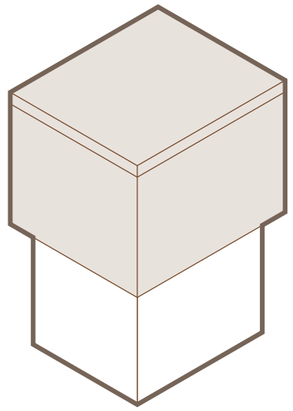

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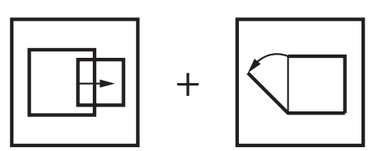

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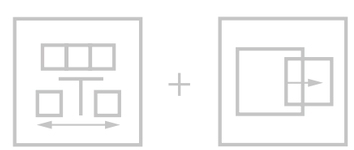

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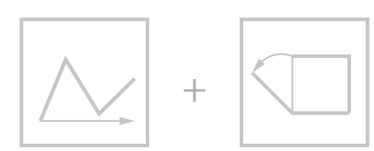

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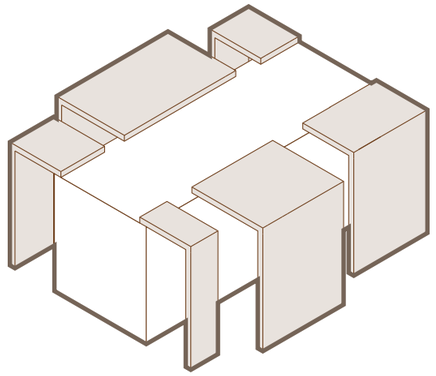

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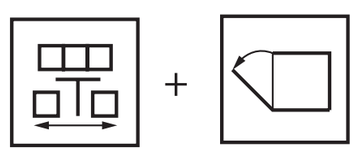

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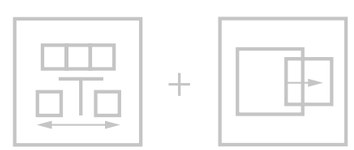

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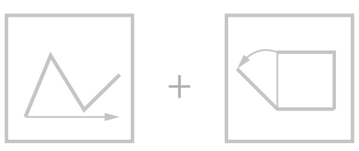

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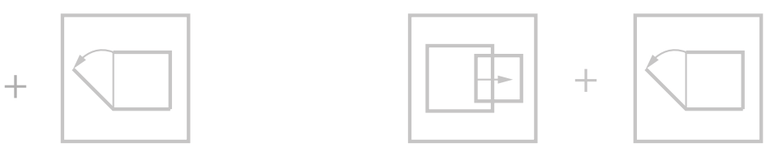

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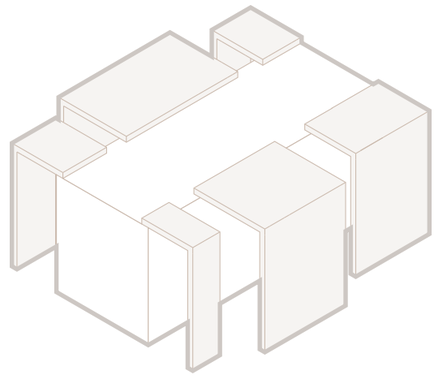

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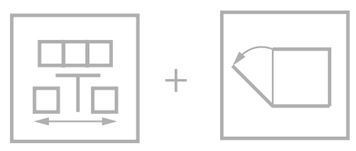

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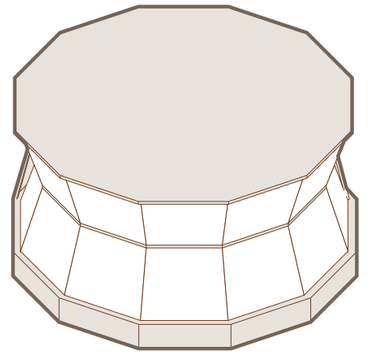

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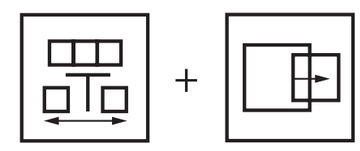

THE END.

THANK YOU!