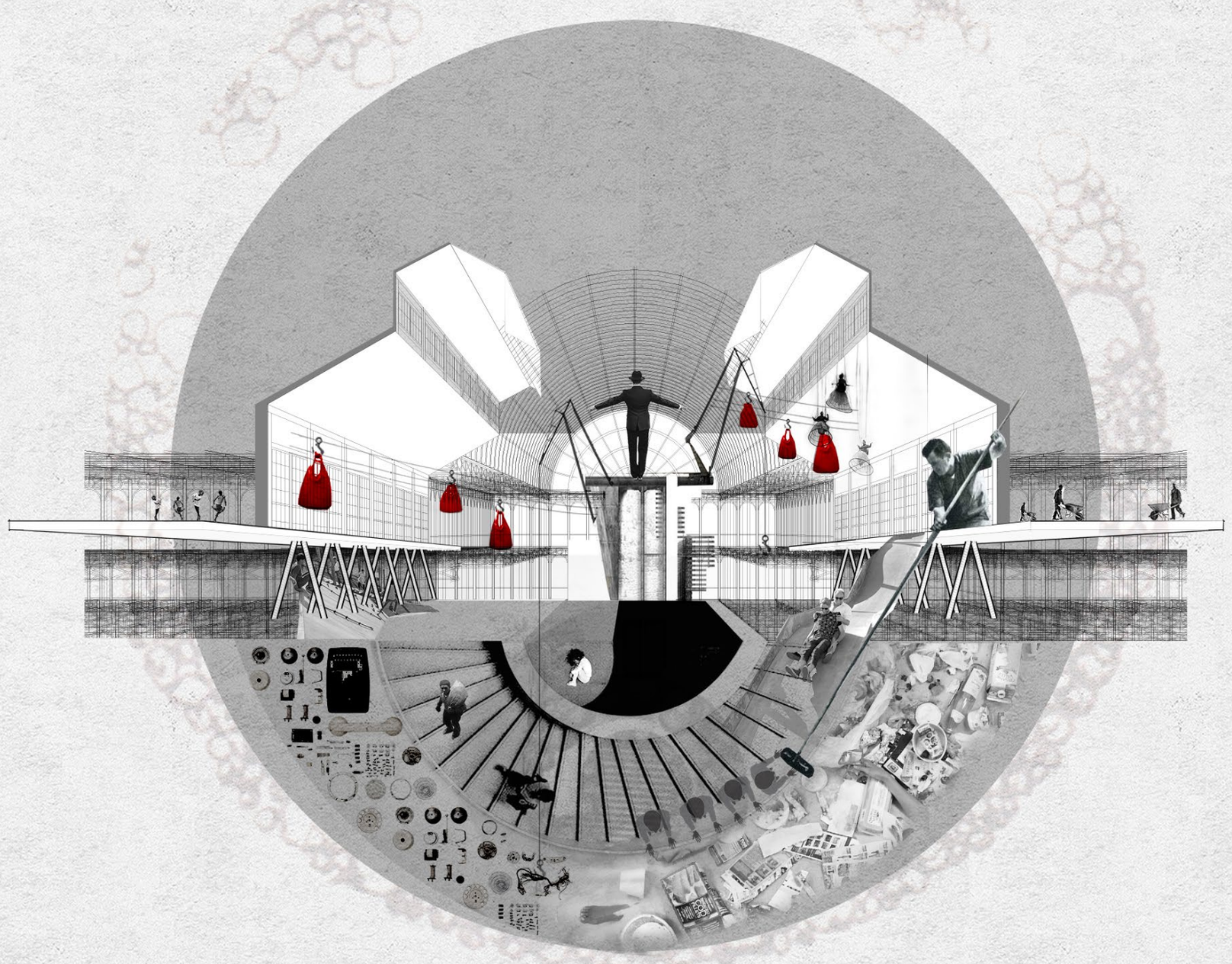
Faculty of Architecture and the Built Environment

P5 Presentation

Fall 2016 - Complex Project - Graduation Studio - Havana

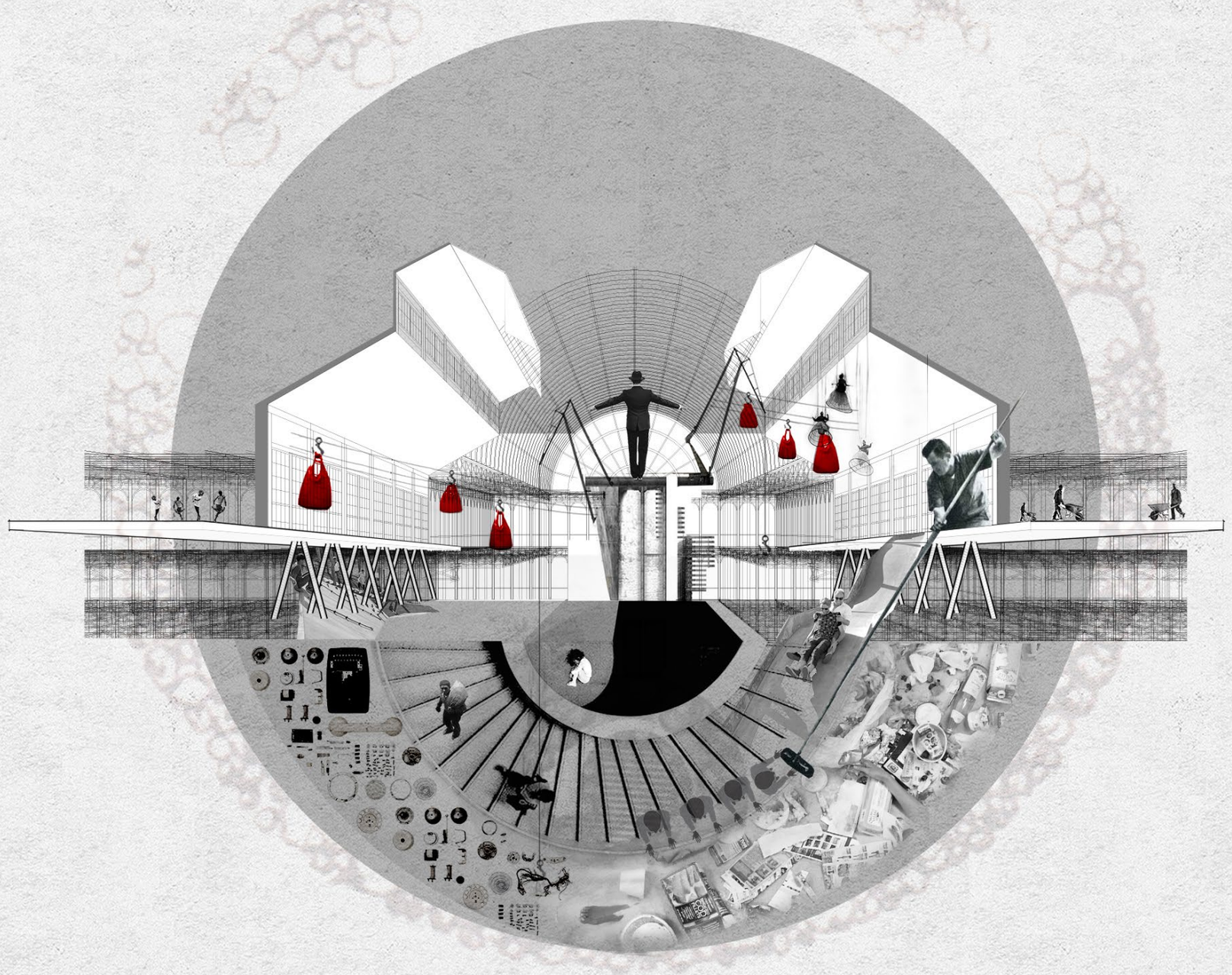
Nicole Chan Ho Yin

Tutor:
Sebastian Janusz
Dr. Karel Vollers

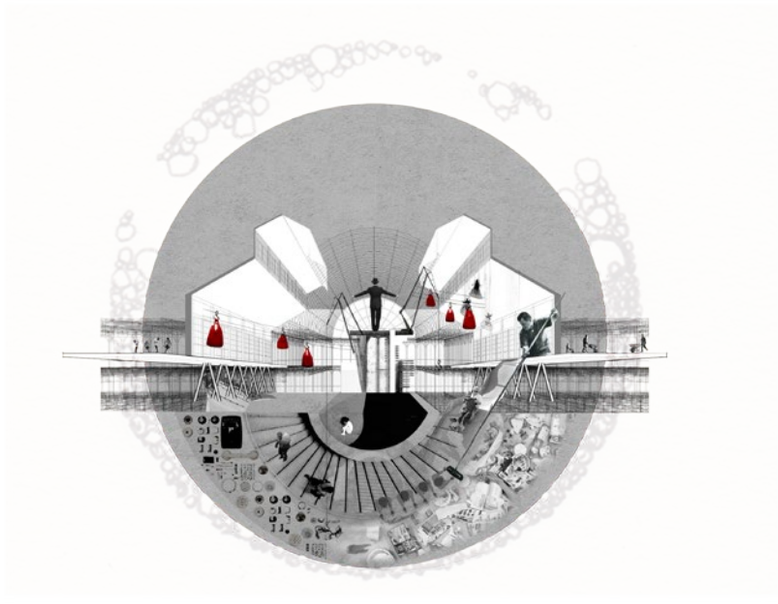


Upcycle and Waste Depot

Research Question



How urban intervention facilitates the current cultural significance of Cuban “accidental sustainability” for alternative recycling?



WHAT:

collective platform to share sustainbility + waste transfer station

WHY:

the influence of unhealthy waste network

HOW:

use the existing sustainable culture to stitch up the waste network

Research Structure

1 Research

2 Case Studies

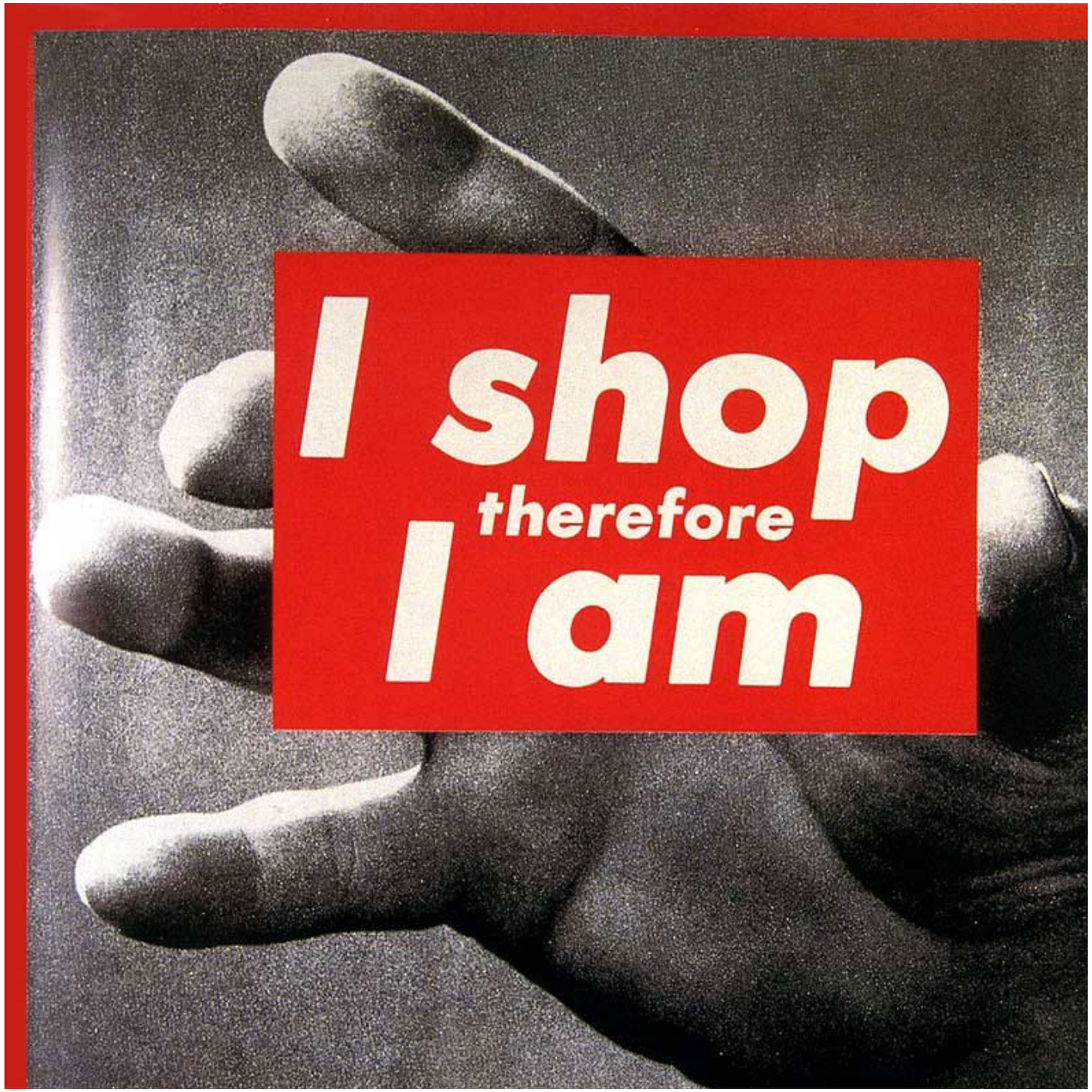
3 Design

4 Building Technology

1

1. Defining Moment - Accidentally Sustainability
2. Accidental Sustainability Created Innovation
3. Problem – “unhealthy” Waste Network

Defining Moment - Accidentally Sustainability



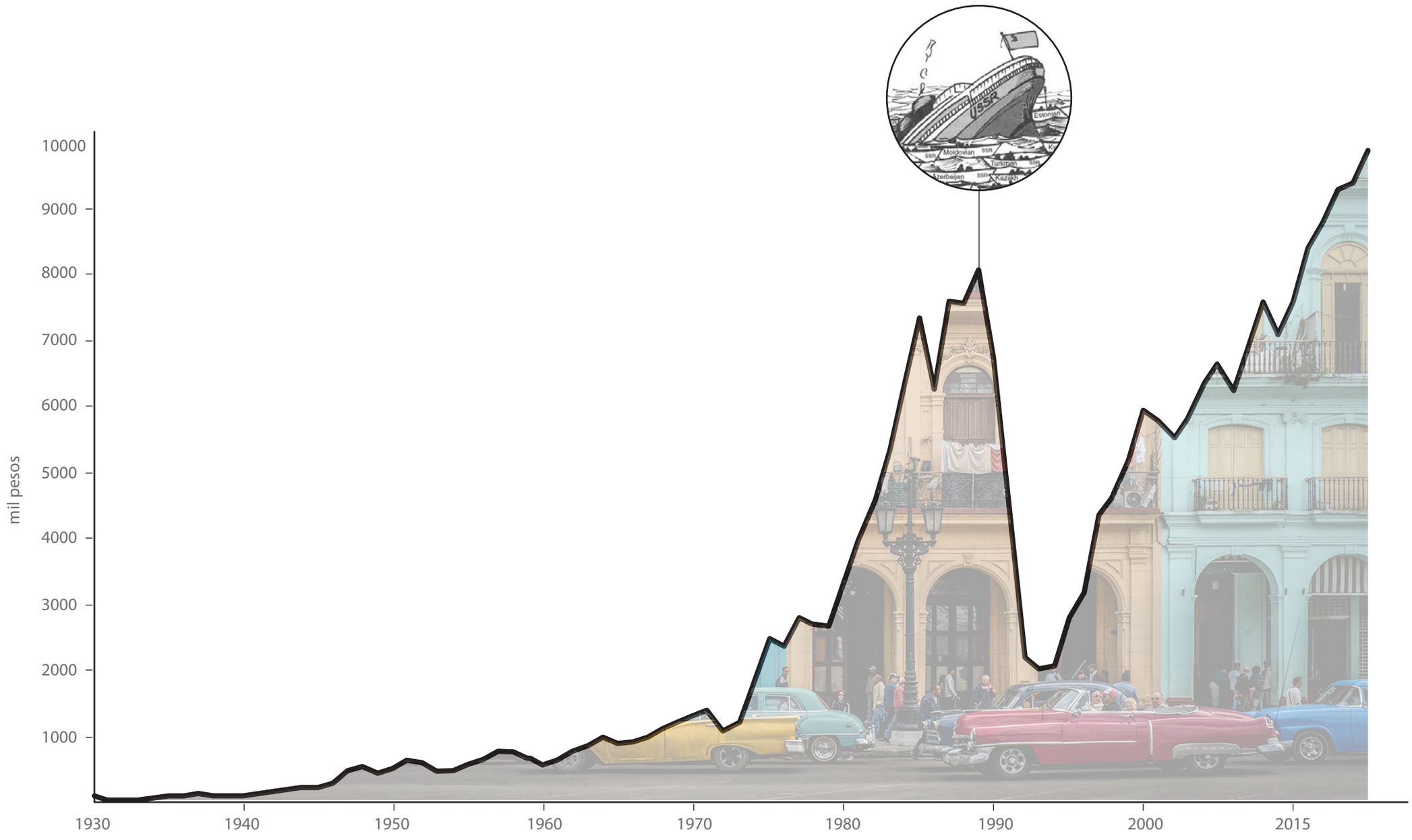
Pop Art Artist - Barbara Kruger

Defining Moment - Accidentally Sustainability

The Ration book record what food and groceries allowed for each person.

Defining Moment - Special Period

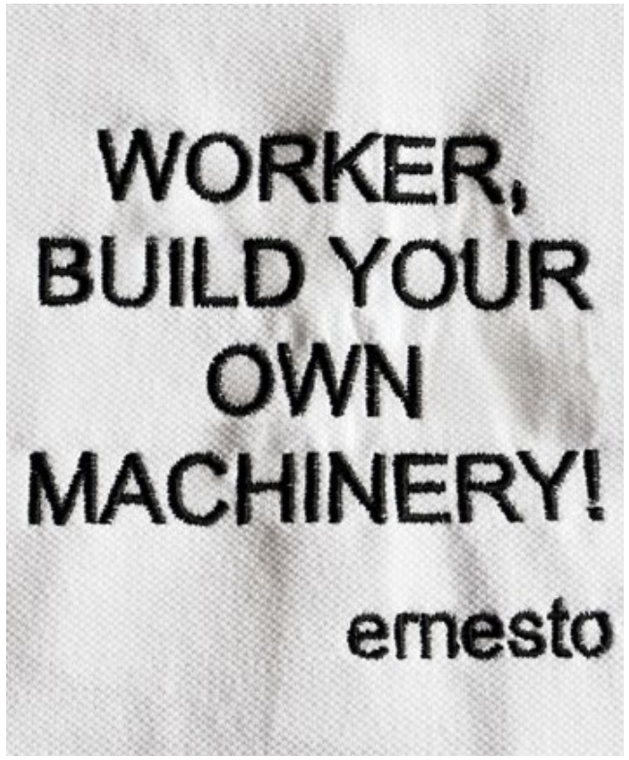
accidental sustainability

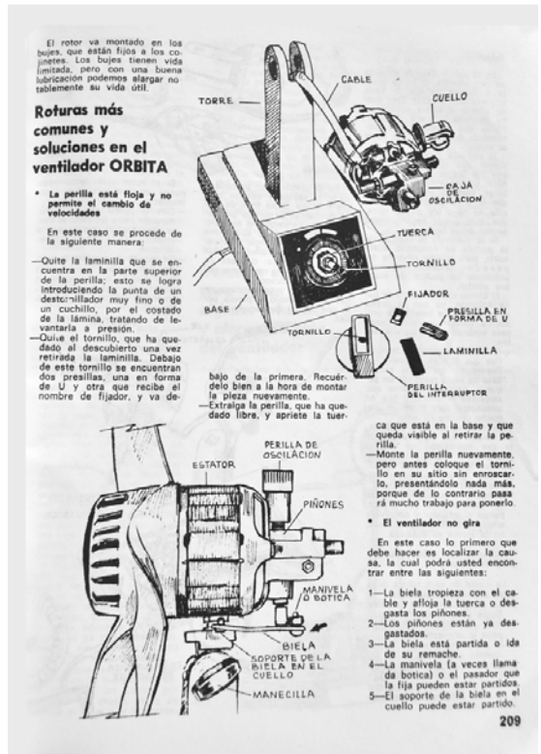


Cuba Good Import

Accidental Sustainability Created Innovation

Ernesto Che Guevara's Exhortation



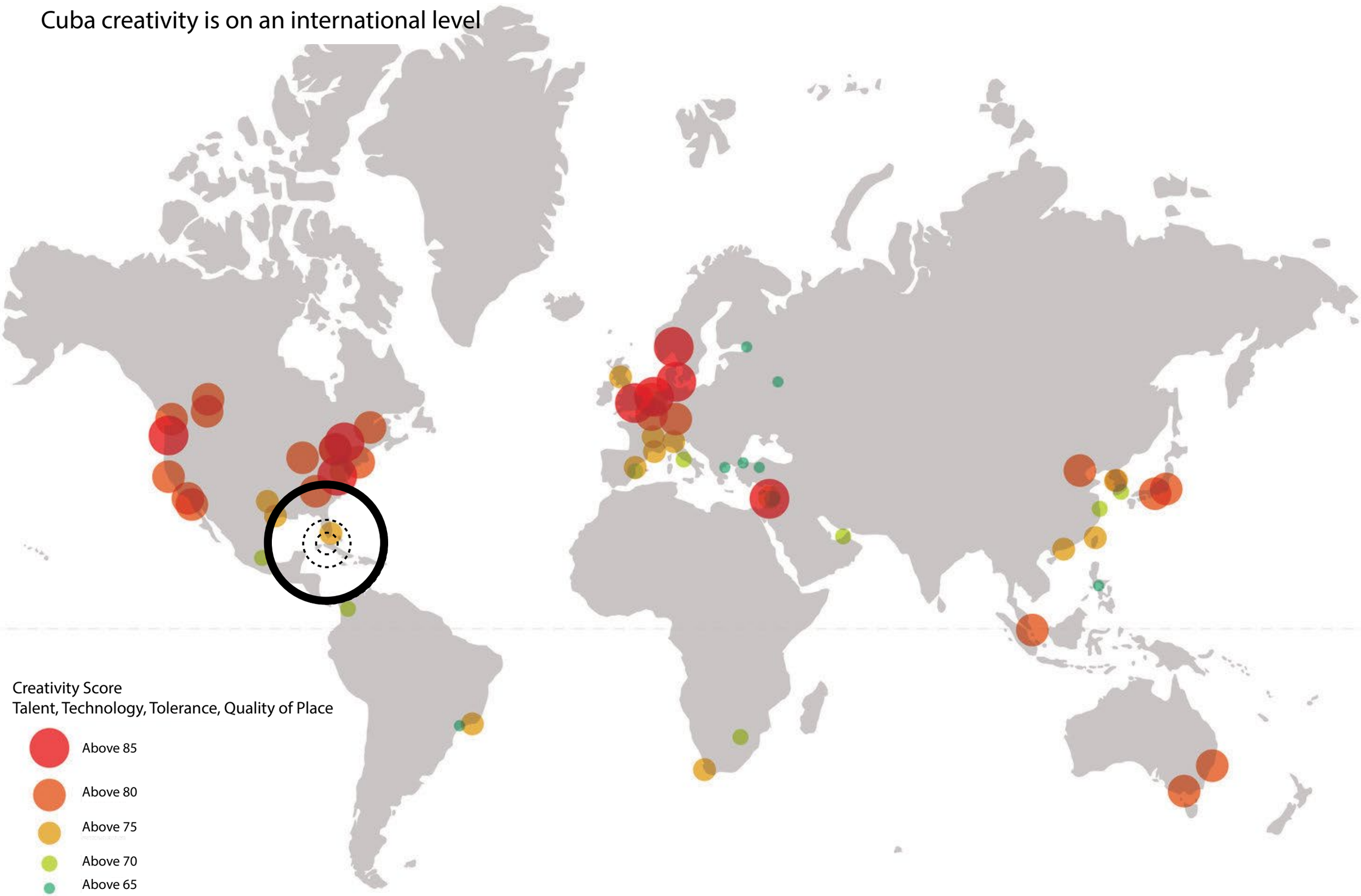


Book "Con Nuestros Propios Esfuerzos"

Accidental Sustainability Created Innovation

Accidental Sustainability Created Innovation

Cuba creativity is on an international level



Source: University of Toronto, Rotman School of Management, August 2013

Havana-born artist José Manuel Fors (1956) received the 2016 National Visual Arts Prize

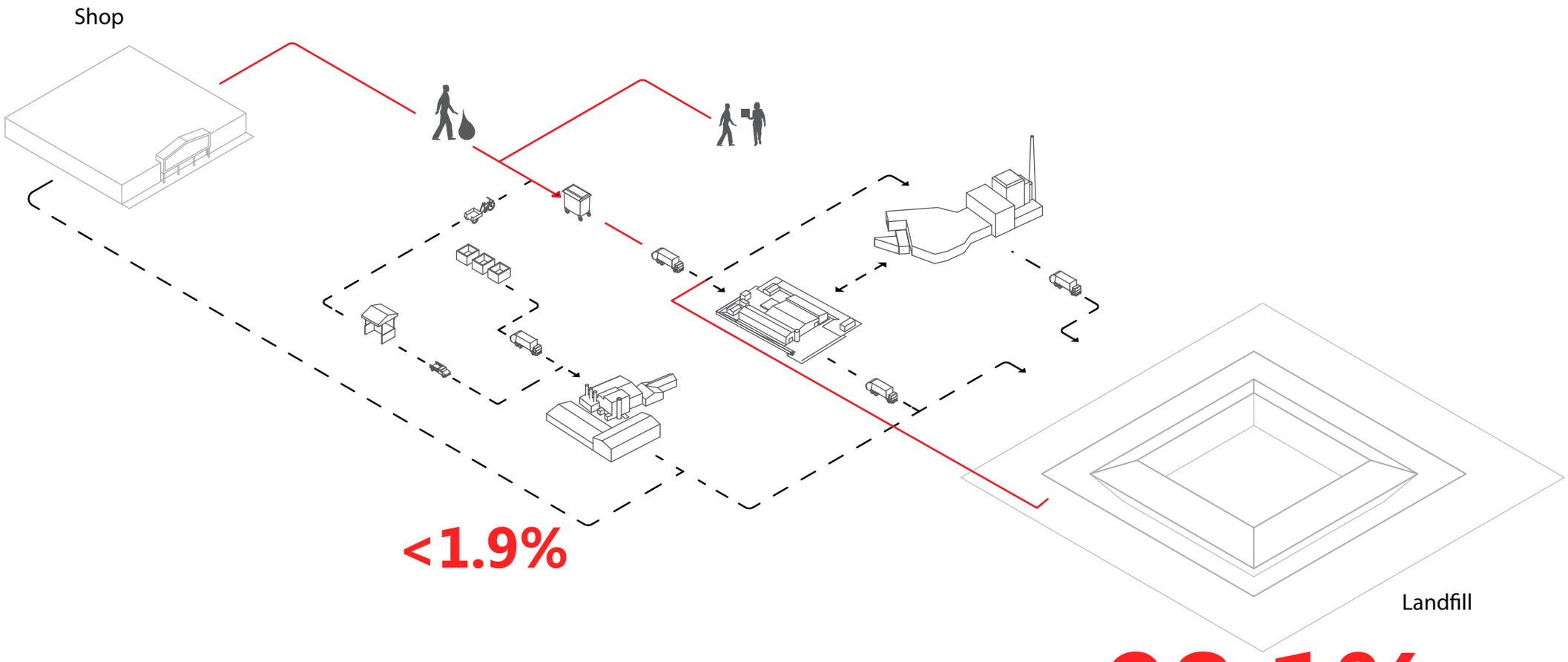
Major collection is about recycled materials

Public art everywhere

Location: Profunda - Luyano

Problem - Waste Everywhere

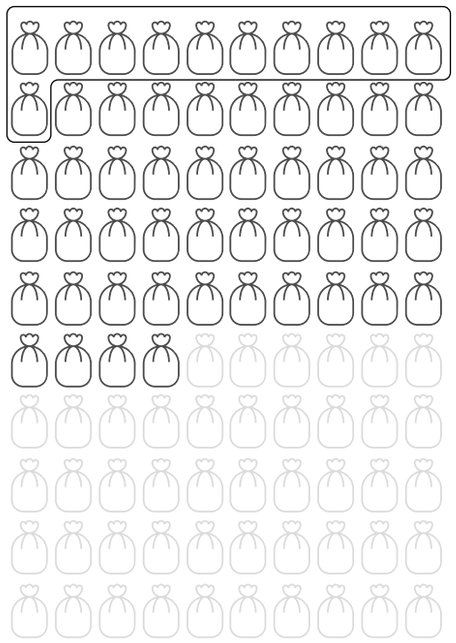
Problem - Unhealthy Newtorks of Municipal Solid Waste in Havana



Problem - Unhealthy Newtorks of Municipal Solid Waste in Havana

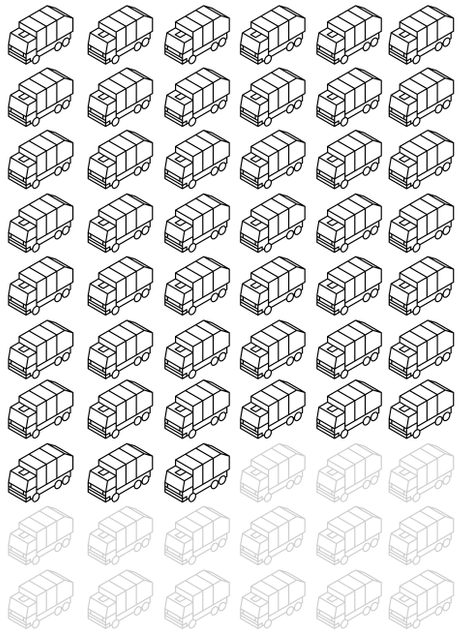
How long until waste is gone?

986
tons/day



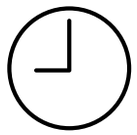
Estimated Domestic Waste Generation in Havana in 2015: 1494 tons/day

40
Vehicles



Collection Performance per day:
Compactor Truck: 500 ton-km/day
10m^3 Dump Truck: 209 ton-km/day

10 hours / Day



2 to 4.7
Day





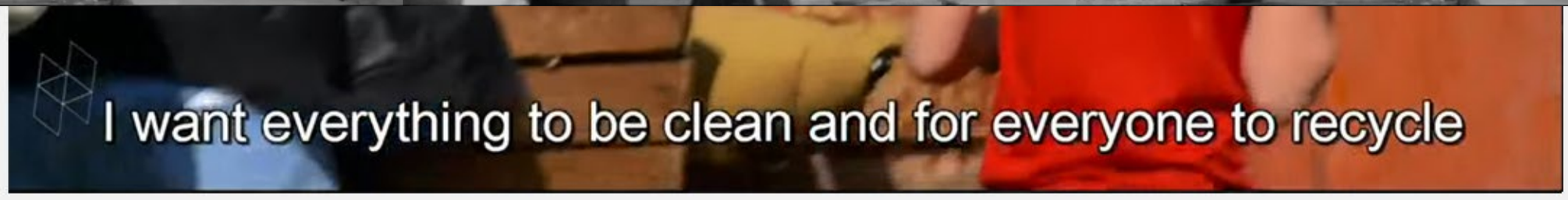







YouTube NL

Search



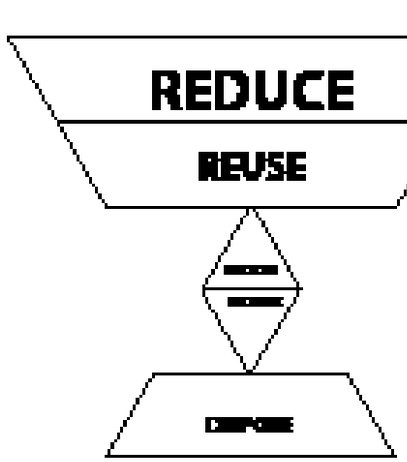
People & Power - Cuba: The times are changing

Al Jazeera English

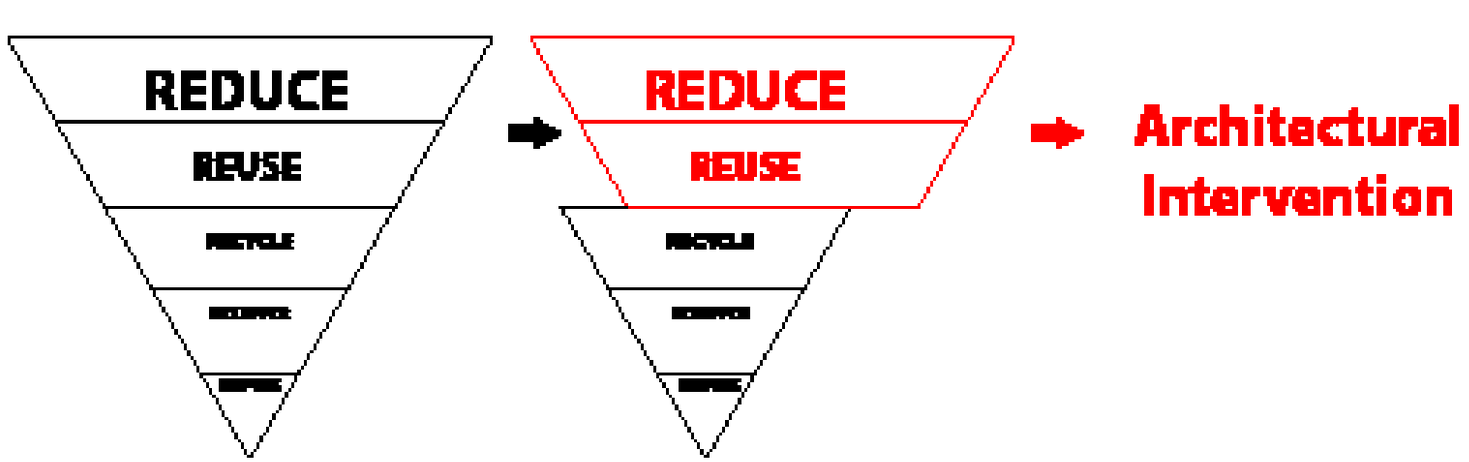
Subscribe 1.3M

239,157 views

Design Concept



Cuban Waste Hierarchy



Proposed

Potential 1 - Turning waste into a resource

Potential 1 - Turning waste into a resource

Potential 2 - Utilize the repair/reuse skills

RECENT PROGRAMS | POLITICS | ARTS | NATION | WORLD | ECONOMY | SCIENCE | HEALTH | EDUCATION | TEACHERS | THE RUNDOWN

PBS NEWSHOUR

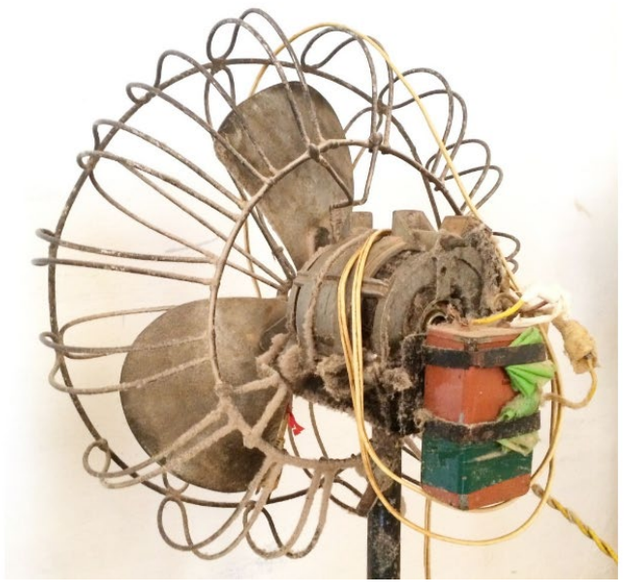
SUBSCRIBE FOLLOW US

TOPICS > SCIENCE

How communism turned Cuba into an island of hackers and DIY engineers

9132 BY JENNY MARDER *January 7, 2015 at 5:04 PM EST*

EMAIL



SunSentinel | HOME | E-NEWSPAPER | NEWS | BROWARD | PALM BEACH | MIAMI-DADE | CLASSIFIED | SPORTS | CONTACT/ABOUT

Home → Collections → **Cubans**

Related Articles

Rum ... and hold the politics
January 12, 2007

Publix Celebrates A Year Of Recycling Plastic, Paper Bags...
September 12, 1991

Necessity makes Cubans masters of recycling

Practically all things have second lives

January 11, 2007 | By Doreen Hemlock HAVANA BUREAU

HAVANA, Cuba — Ariel Rodriguez makes new keys from old ones. He shapes them on a 1953 key-copying machine that he bought broken and fixed with parts from a grain mill. He shines them on a key polisher he rebuilt with a washing-machine motor.

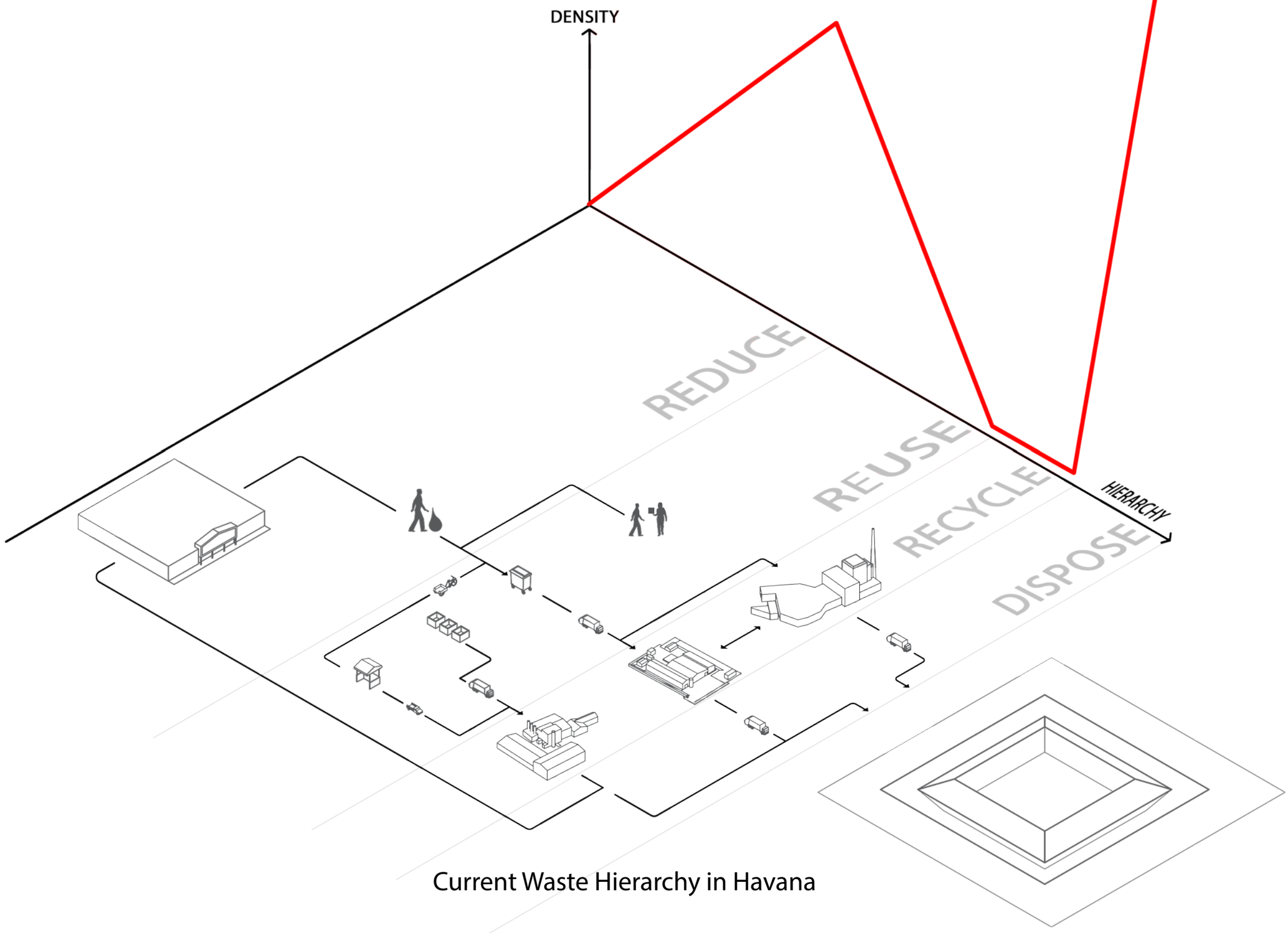
Next to him at a government-run repair center, Raul Leiva fixes eyeglasses from old frames.

Faced with chronic shortages, meager salaries and the United States' economic embargo, Cubans have mastered the art of recycling. The socialist government promotes the practice as a way to save the planet. But for most Cubans, it's more about saving themselves.

"Cave men figured out how to cook with fire. We invent ways to get by," said Rodriguez, 34, who buys old keys mostly from struggling retirees who scavenge their neighborhoods looking for extras to sell. "It's a question of survival."

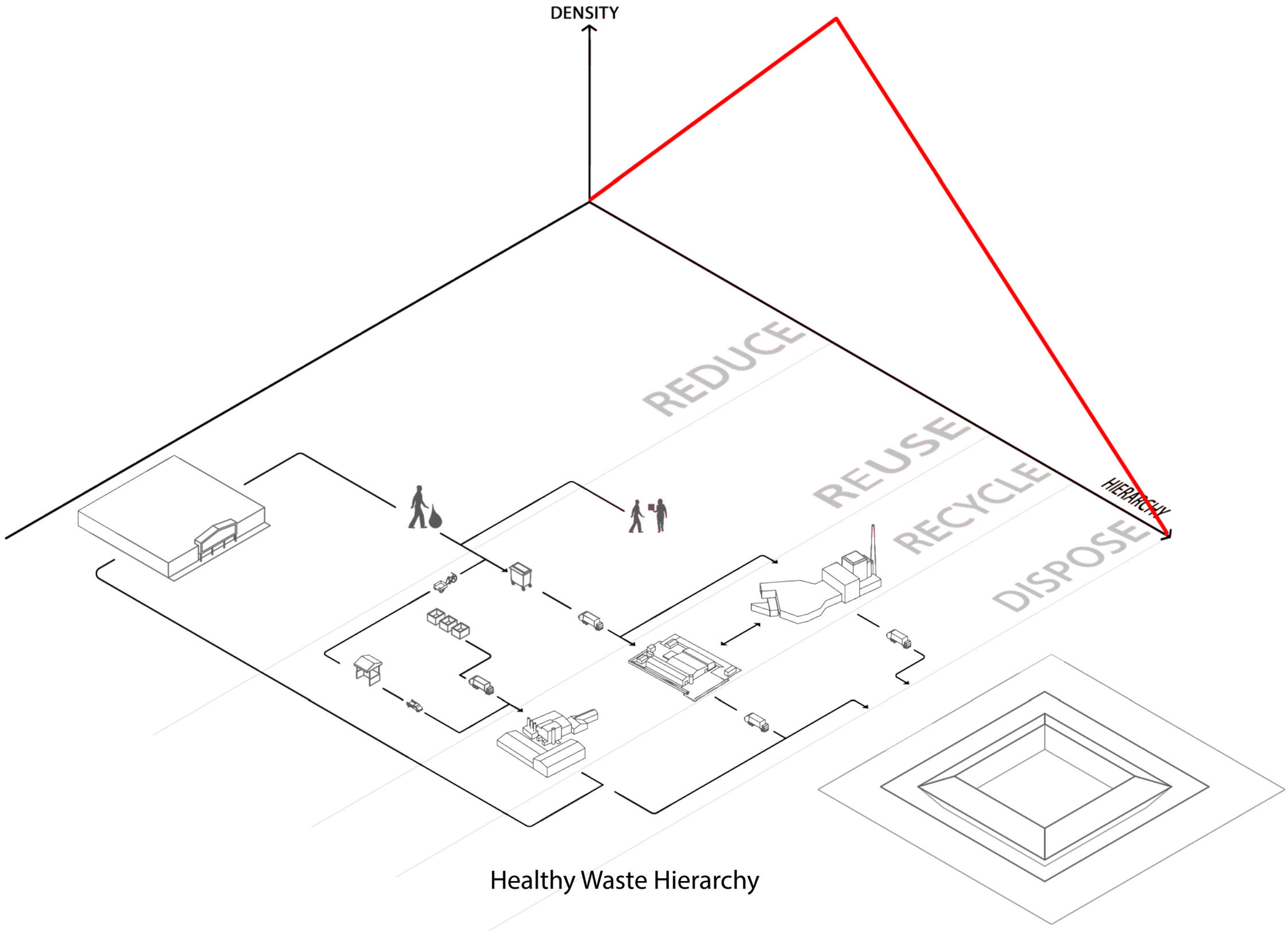
Just about everything in Cuba seems to be re-used. Coffee grounds from the morning brew become fertilizer in gardens. A plastic CD cover doubles as a picture frame. And the cardboard centers from toilet paper rolls serve as hair rollers for women.

To Improve the waste network



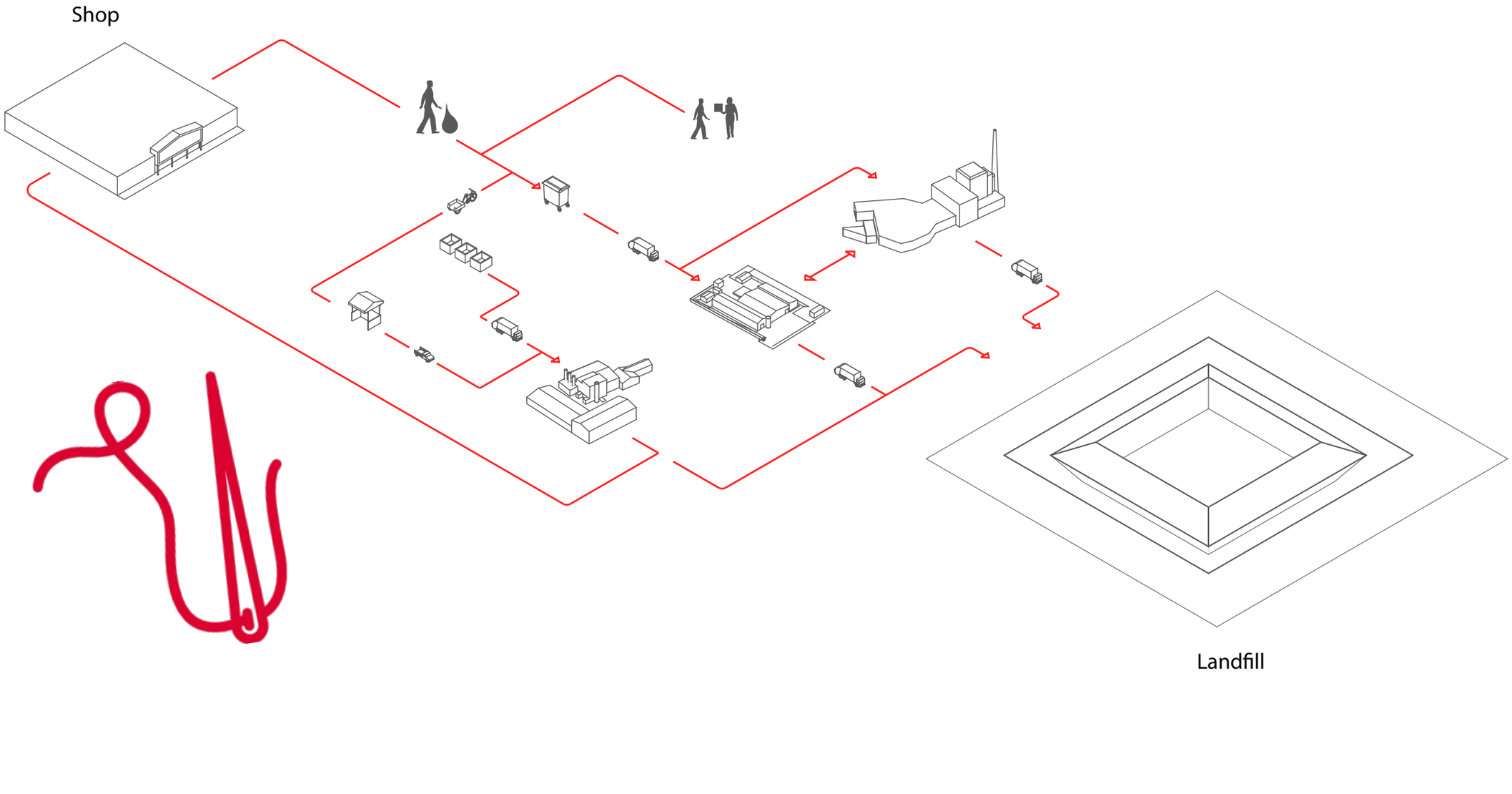
Current Waste Hierarchy in Havana

To Improve the waste network



Healthy Waste Hierarchy

Ambition - Stitch up the waste network



2

Case Studies

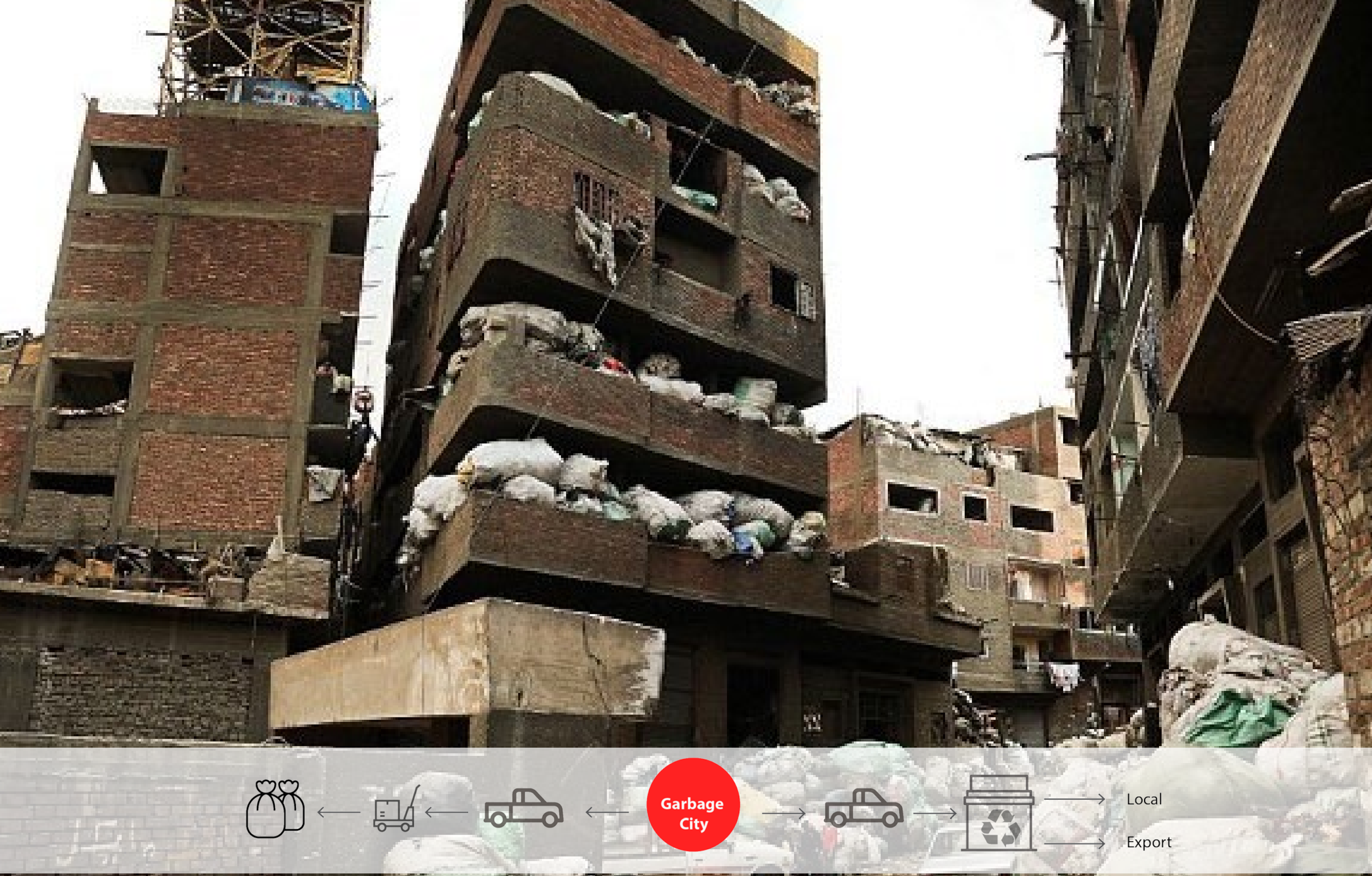
1. Garbage City in Cairo

Garbage City - Manshiyat Naser, Cairo

The world's largest recycling hub

80%

recycling rate through zabaleen


Garbage City
Local
Export

Timeline of Precedent Studies - Waste Recycling Facilities

Public Participation

2000

2005

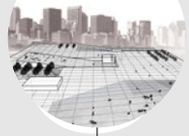
2010

2015

Ecopark
Barcelona, Spain 2004
25.000 m²

Naka Incineration Plant
Hiroshima, Japan 2004
19.977 m²

From Place to Plant
Chicogo, IL 2011



Sydhavns Recycling Center
Copenhagen, Denmark 2016
1.500 m²

Amager Bakke Waste to Energy Plant
Copenhagen, Denmark 2017
12.600 m²

Smestad Recycling Center
Oslo, Norway 2015
6.000 m²

Recycling Plant for Urban Waste
Madrid, Spain 2001
30.000 m²

Sunset Park Material Recovery Facility
Brooklyn, NY 2013
13.000 m²

Waste Disposal Plant
Delft, Netherlands 2000
1.000 m²

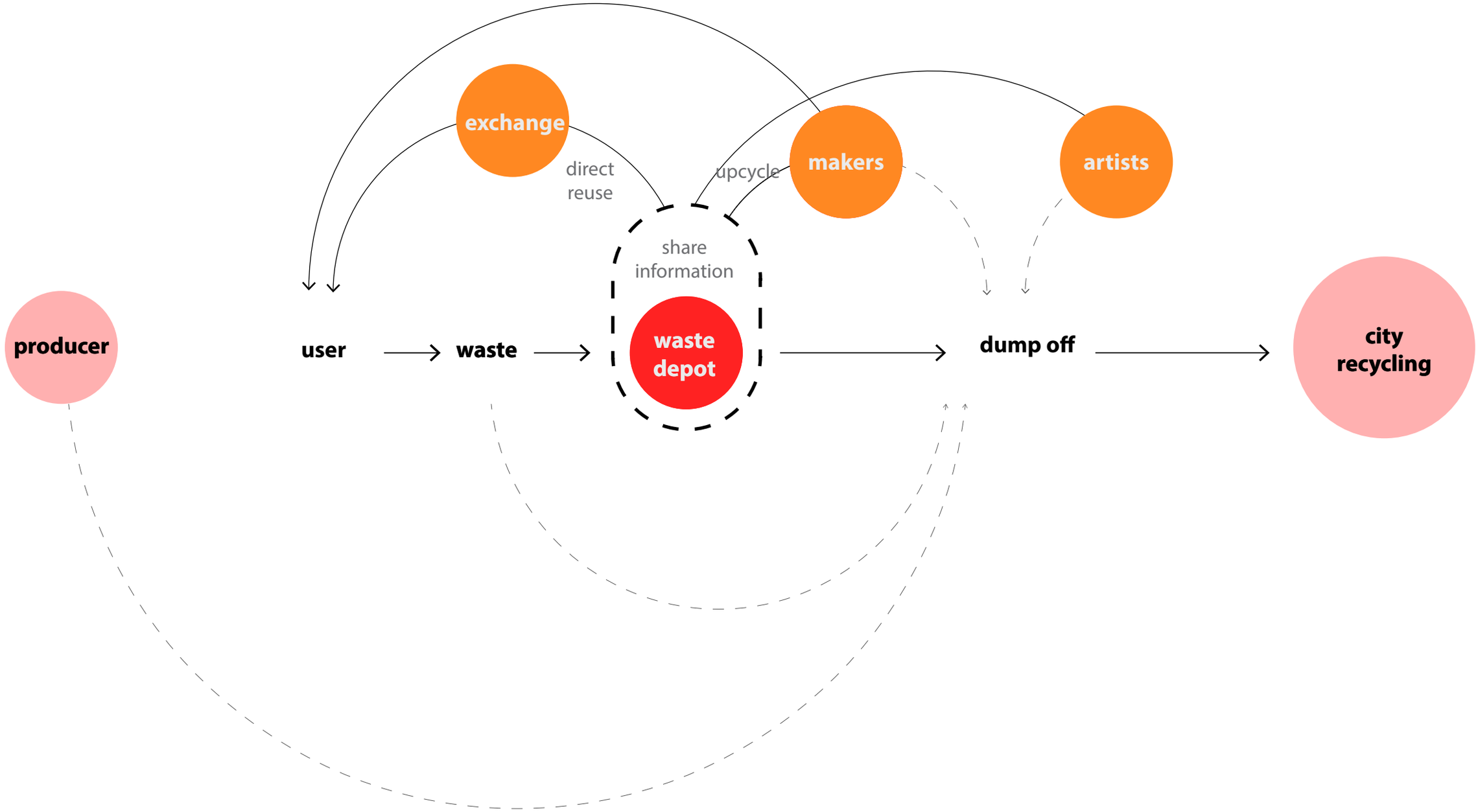
Urban Solid Waste Collection Center
Huarte, Spain 2009
820 m²

Milieustraat Recycling Center
Dordrecht, The Netherlands 2012
5.200 m²

3

Design

Programme Distribution



Space

Daily Life

Art

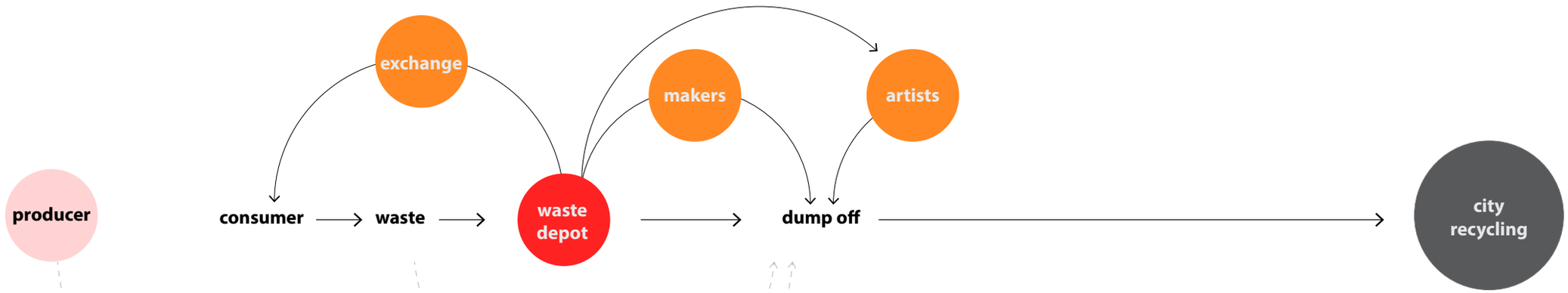
MAKER

MAKER

EXCHANGER

ARTIST

Programme Distribution



Exchange Platfrom

Warehouse 982m²

Event Plaza 2440m²

Cafe/ Bar 112m²

Workshop

Upcycle Workshop
268m² H: 6m

Common Workshop
623m² H: 6m

Artist Workshop
1362m² H: 10m

Multi-function Room
91m²

Education Center

Education Center 330m²

Lecture Room 55m²

Waste Depot

Recyclable Drop-off Area 110m²

Sorting Area 190m²

Disassembly/ Repair Station 1380m²

Service Lane 460m²

Trade + Scale Area 197m²

Baling Area
Glass: 140m² H: 6-9m
Alum. Can: 337m² H: 6-9m
Paper: 441m² H: 6-9m
Plastics: 542m² H: 6-9m
Wood: 480m² H: 6-9m

Back of House

Washroom 70m²

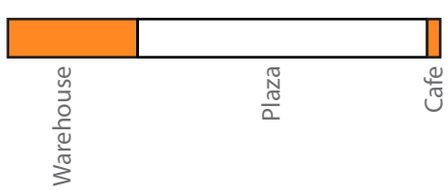
Administrative Office 300m²

Staff Rest Room 80m²

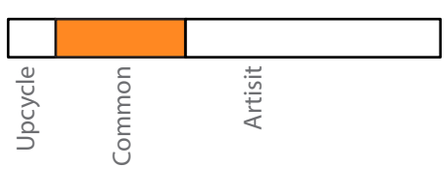
Rainwater Tank 150m²

Refuse Room 77m²

3633m² (33%)

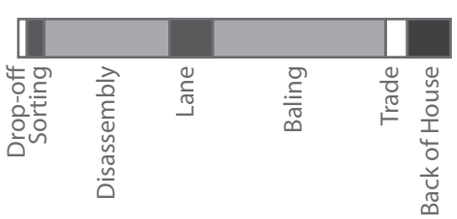


2344m² (21%)



330m² (3%)

4277m² (33%)



527m² (10%)

Total area: 11111 m²

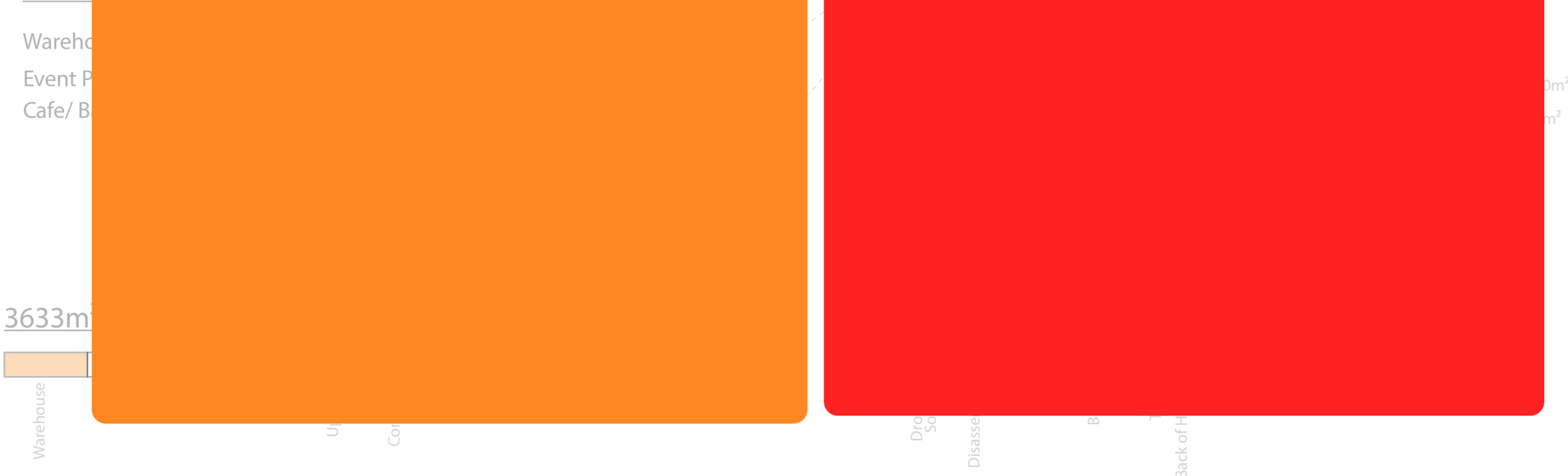
Site Selection

Public Engagement

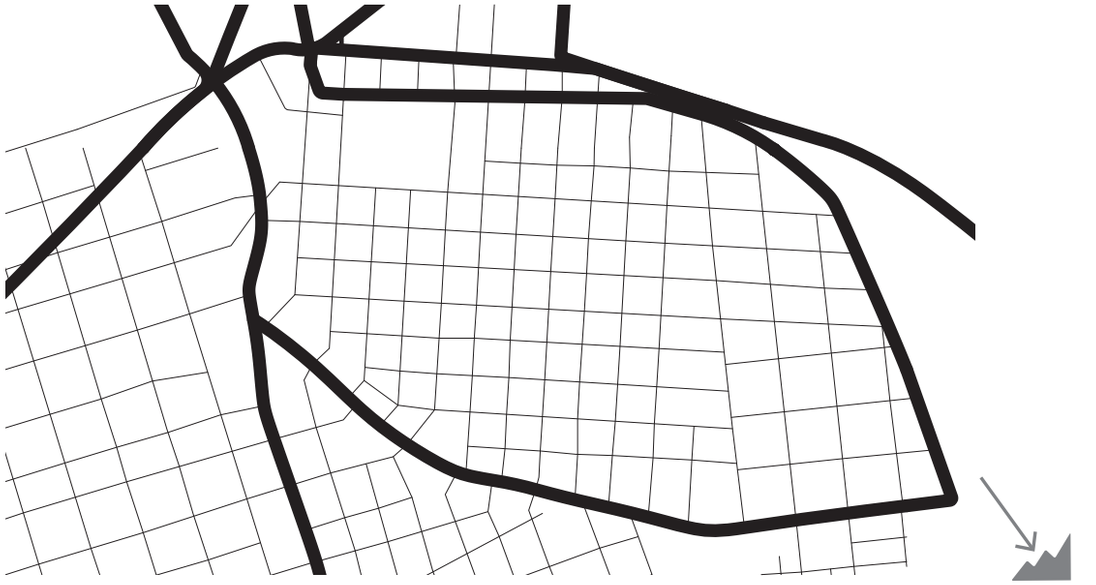
1. close to the area in high public concentration
2. close to the daily-based function

Transport Logistics

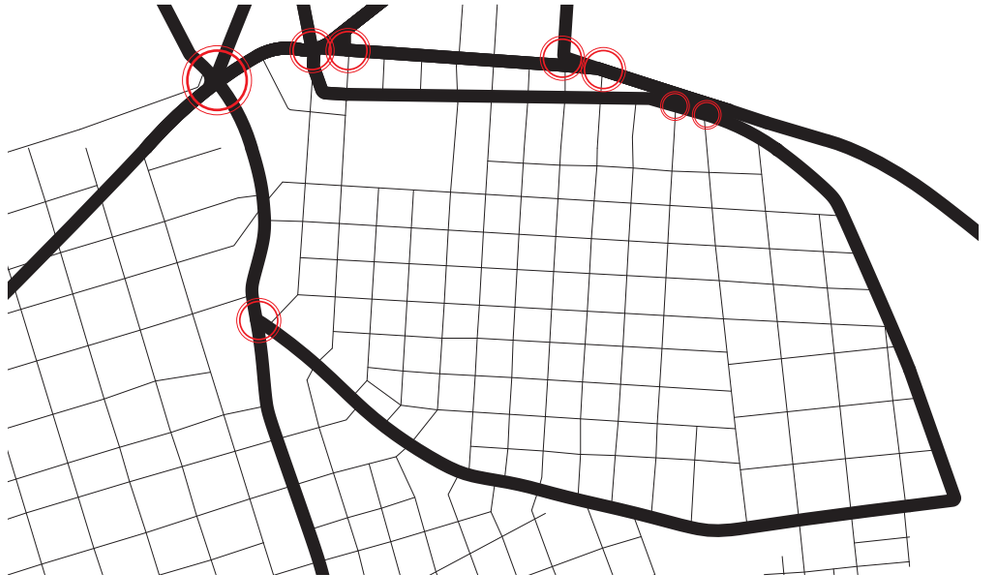
1. close to the main road to landfill
2. avoid the road junctions



Site Selection - Consideration of Transport Logistics



Road Structure



Road Junction

Main Road

Secondary Road

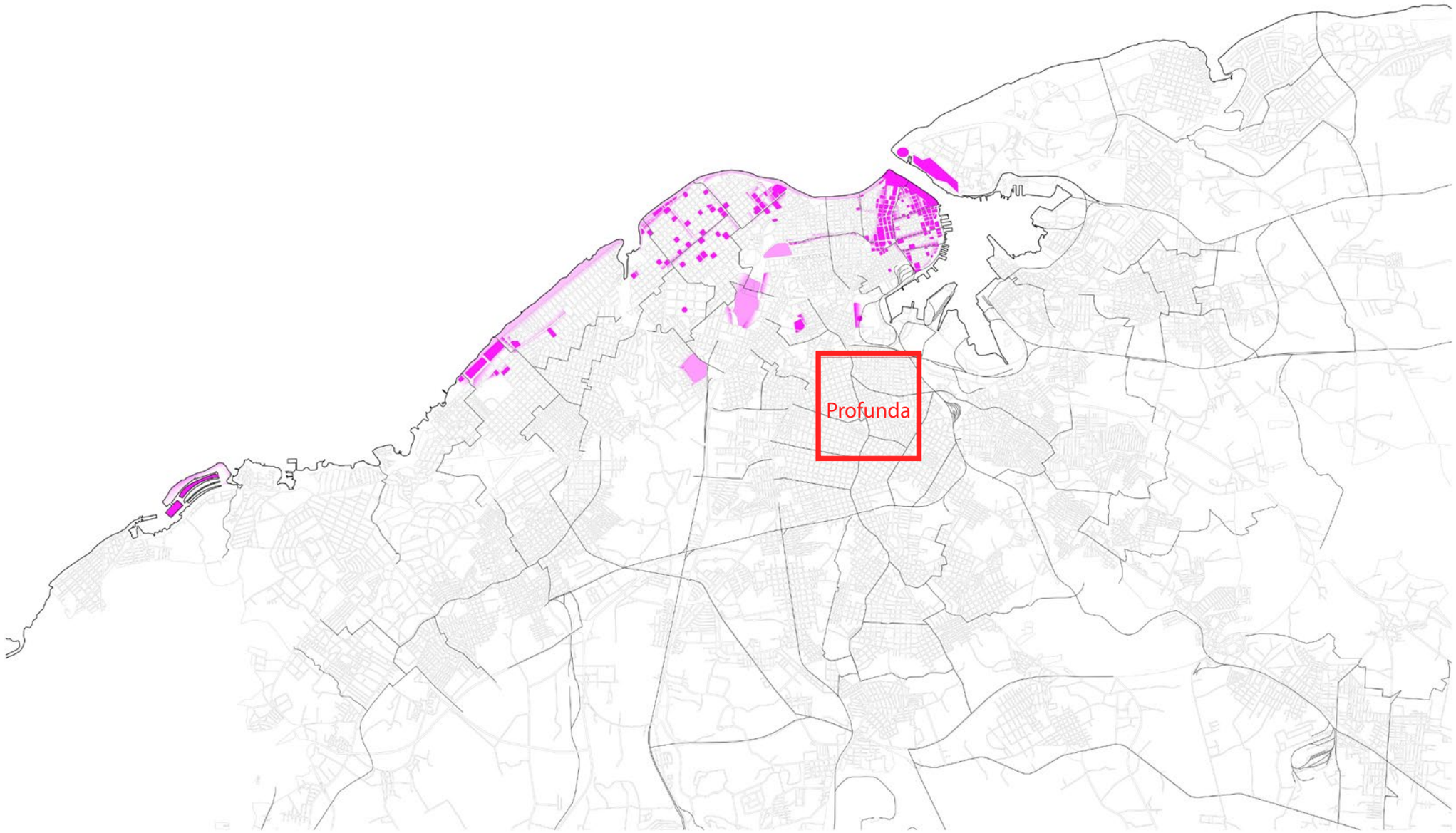
Site Selection - Degree of Public Engagement

Public Concentration

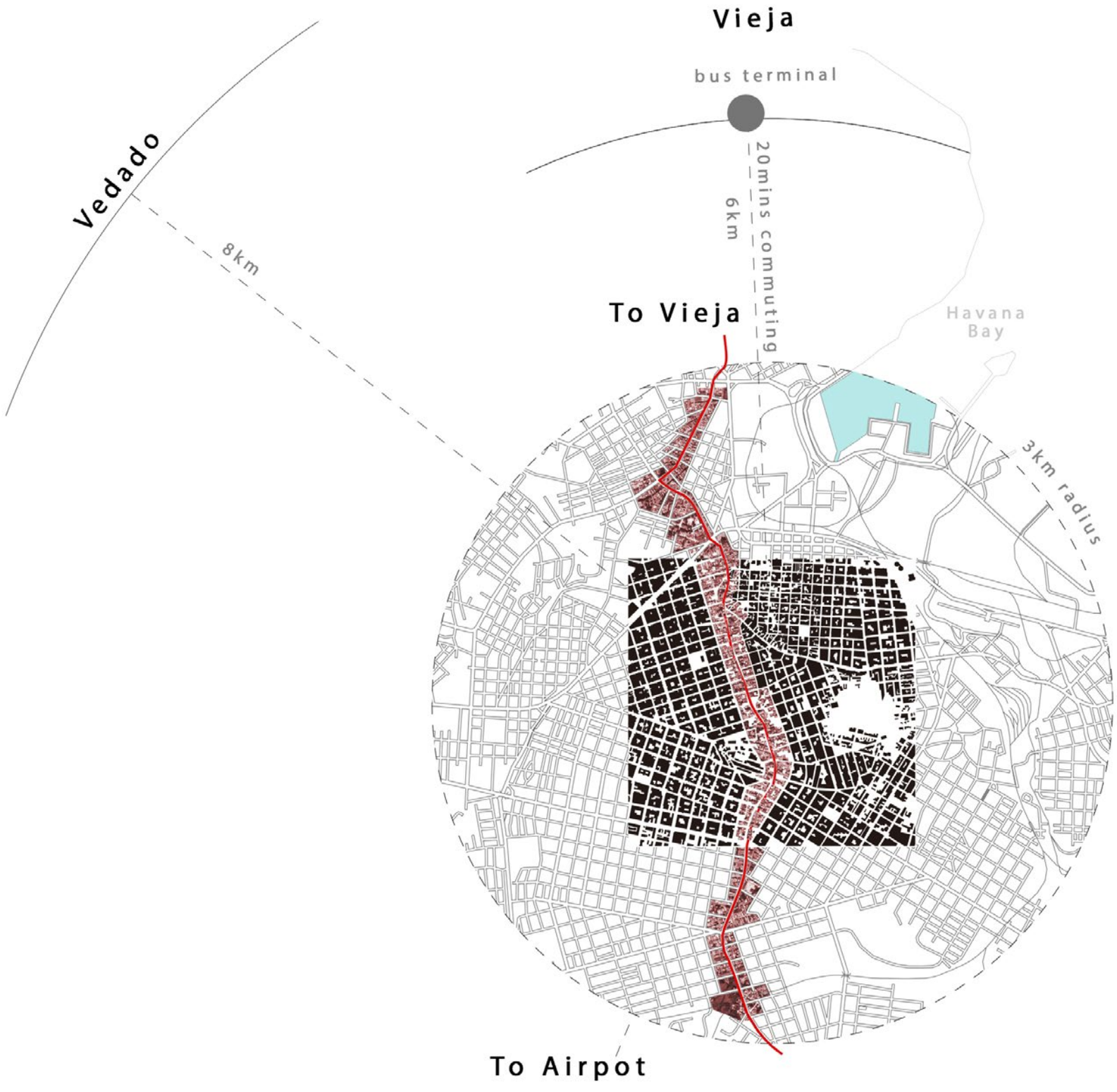
Food Market


Fabrica
To Vieja / Harbour
500m radius
200m radius
Via Blanca
Calle Velazquez
Calle Enna
Calle Arango
Calle Municipio
Calle Rodriguez Este
Calle Perez
School
Market
SITE
Waste Water Treatment Plant
Waste Water Treatment Plant (Extension)
Ramon Pinto
To New Guanabacoa Landfill
To Harbour Terminal

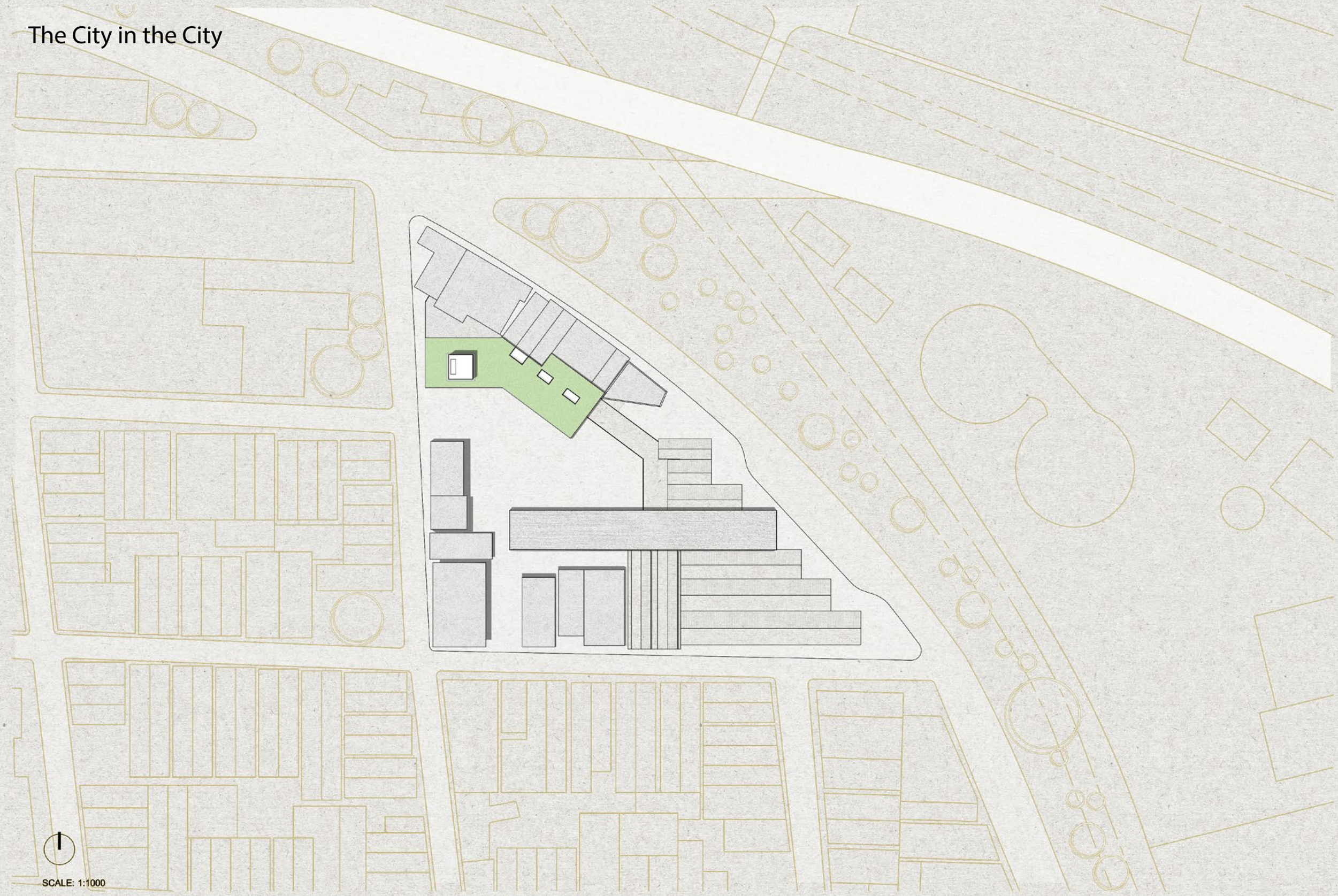
Main Tourist and Commerical activities take place in Veldo and Vieja



Profunda is “back of House” of Havana



The City in the City



SITE PLAN

Design Strategy

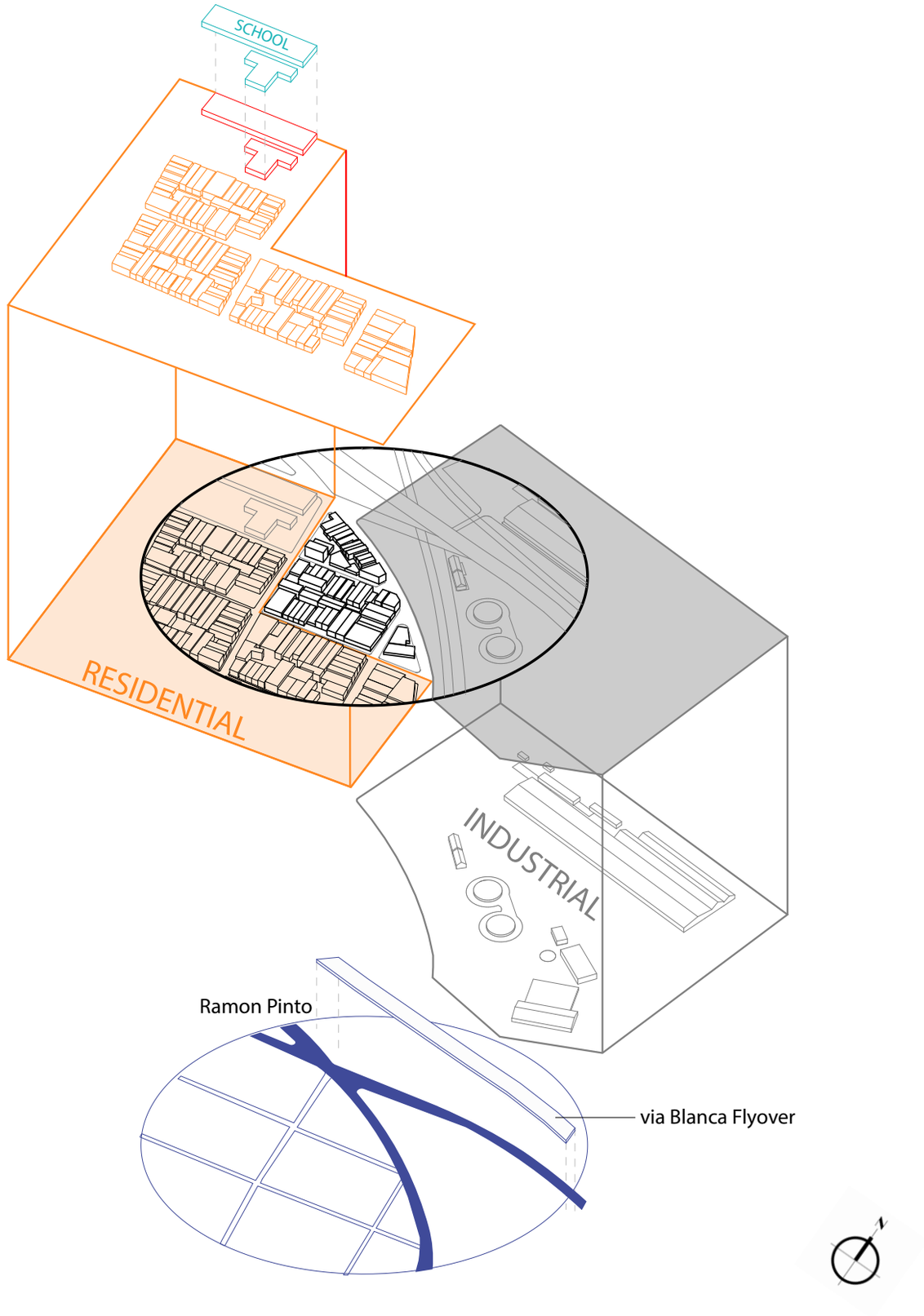
A dialogue between
Communal
and
Indurstrial

Reprogram the use

Reclaim Public Space

Create own identity
by recycled materials

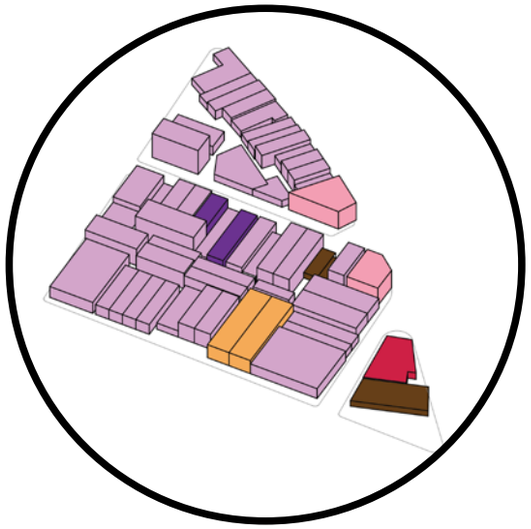
1. A dialogue between Communal and Indurstrial



2. Reprogram the use - To find the potential and quality of site

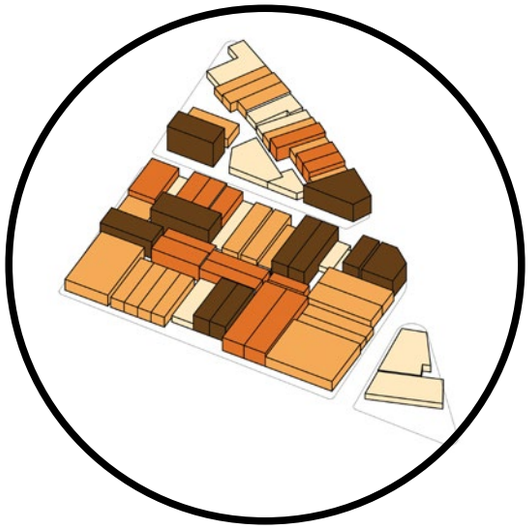
2. Reprogram the use - To find the potential and quality of site

Use



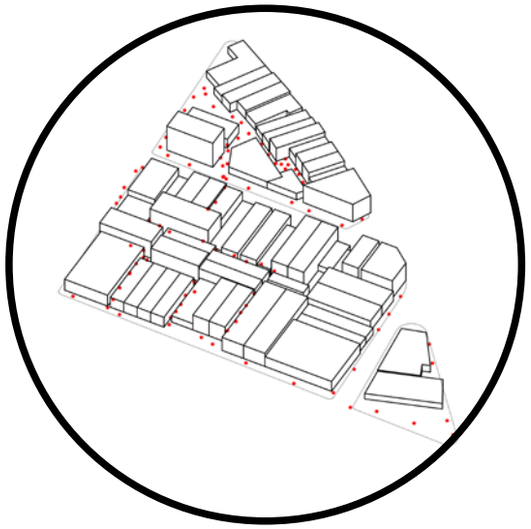
- Ciudadela (Tenements)
- Caseta En Azotea
- Cuarteria
- Bodega
- Factory / Storage
- Vacant

Volumn

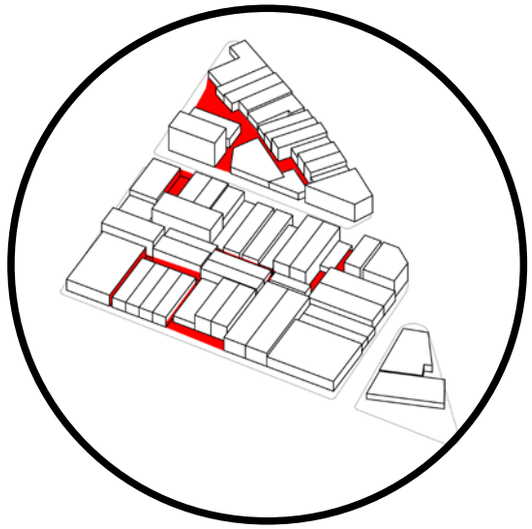


- <3m
- 3m-5m
- 5m-7m
- >7m

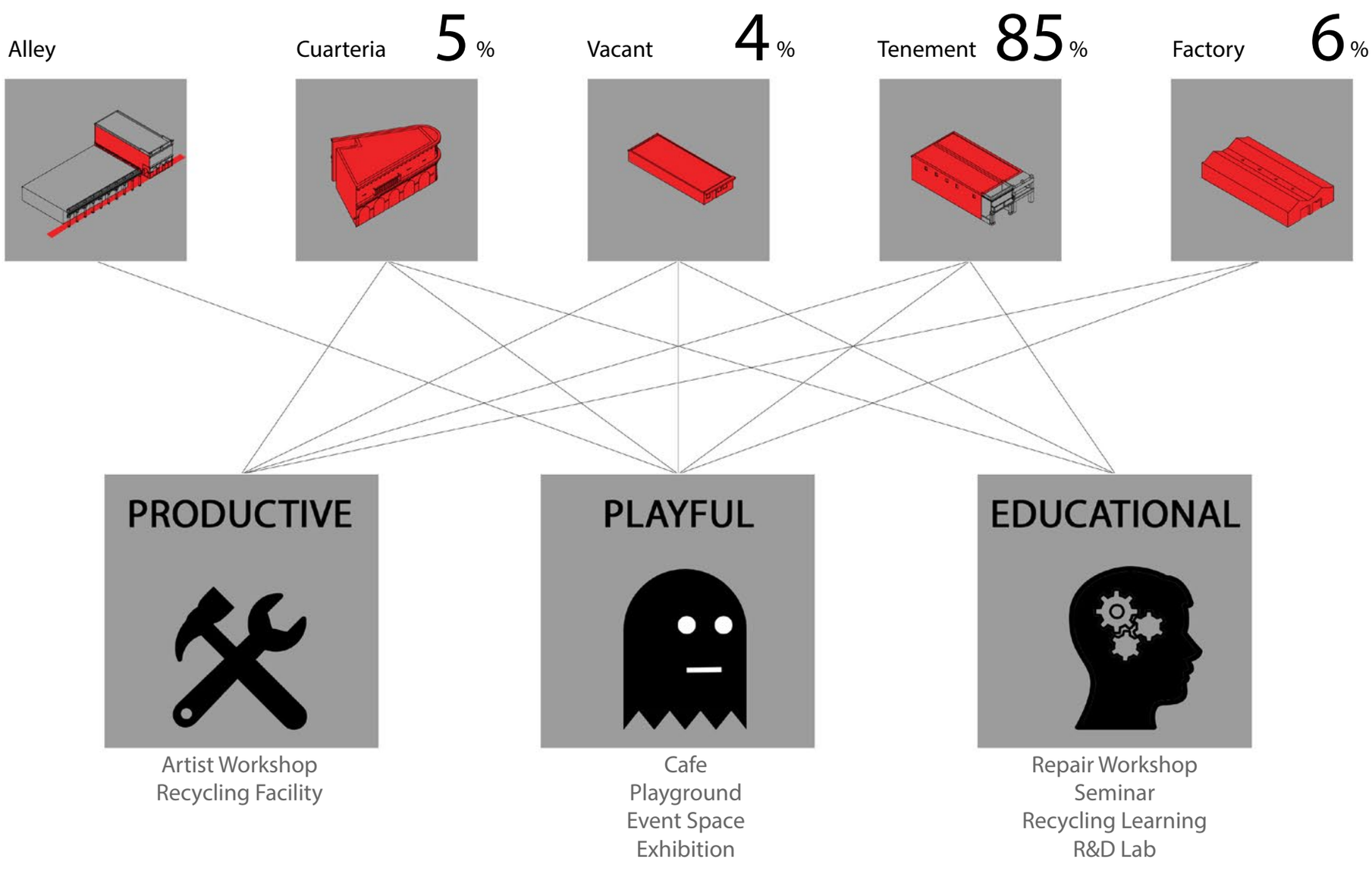
Mobility



Voids

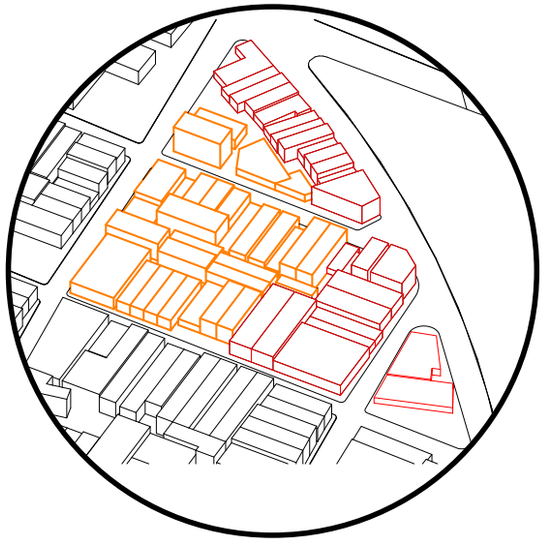


2. Reprogram the use



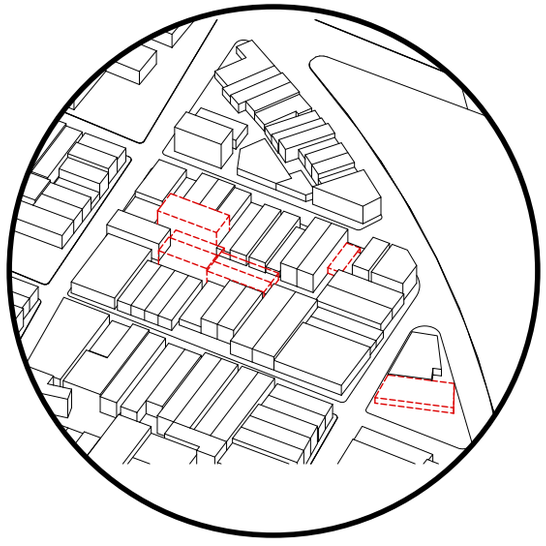
2. Reprogram the use

1



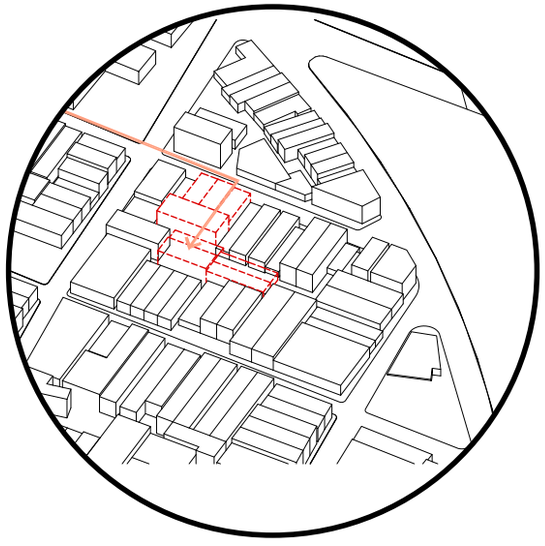
Functionality

2



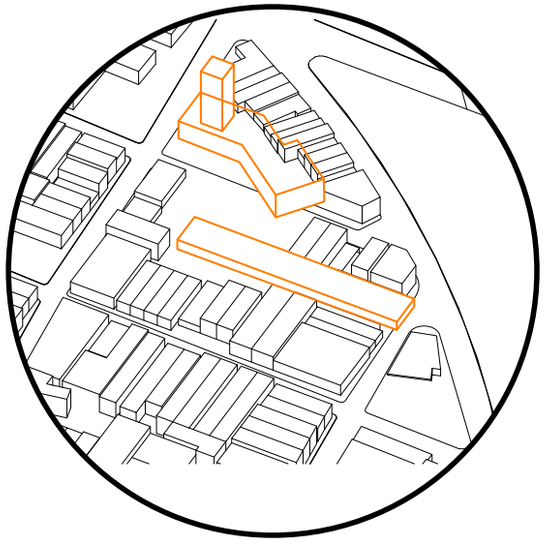
Reclaim Public Space

3



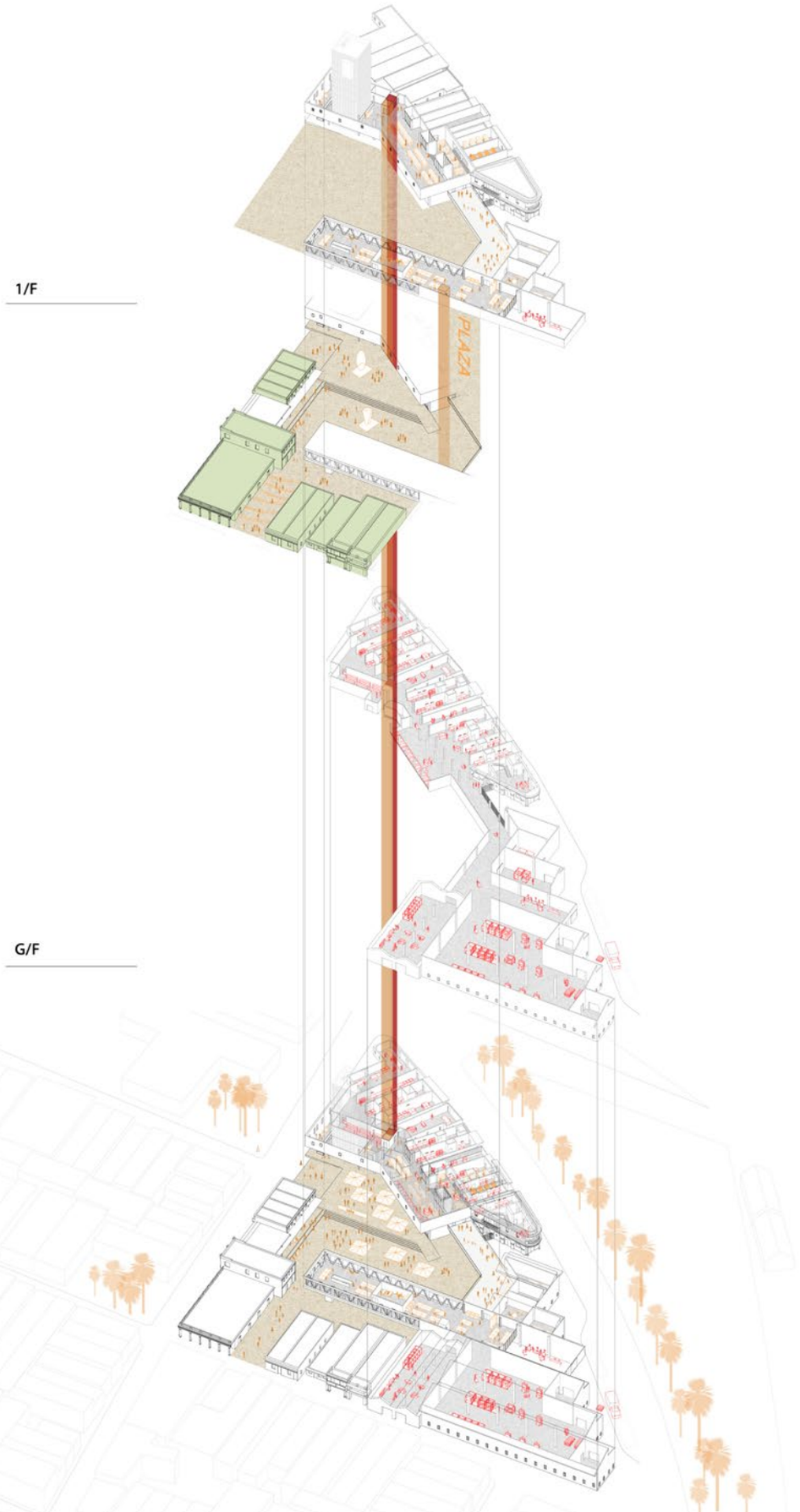
Create Movement

4

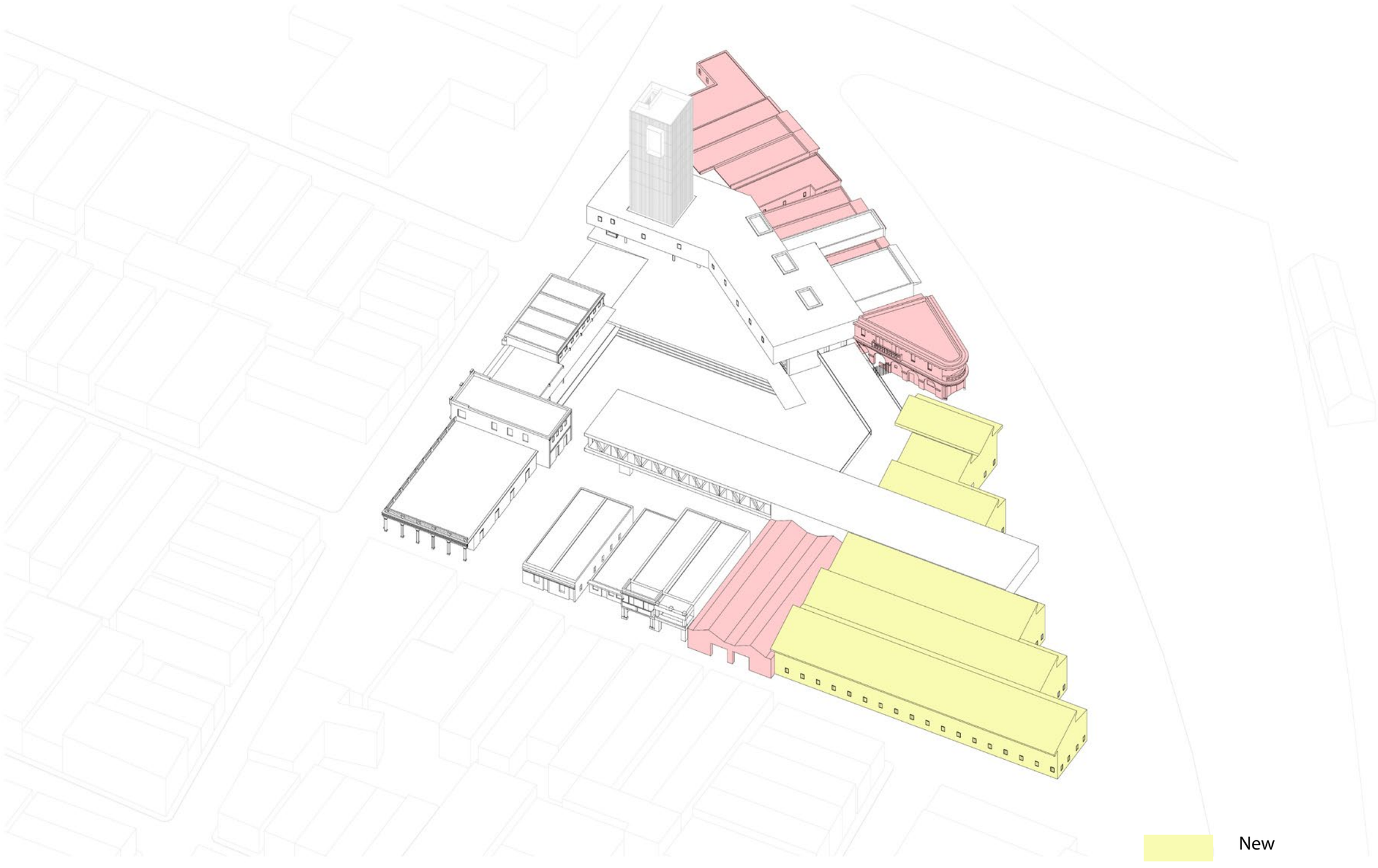


Plug-in New Communal Function

Axonometric



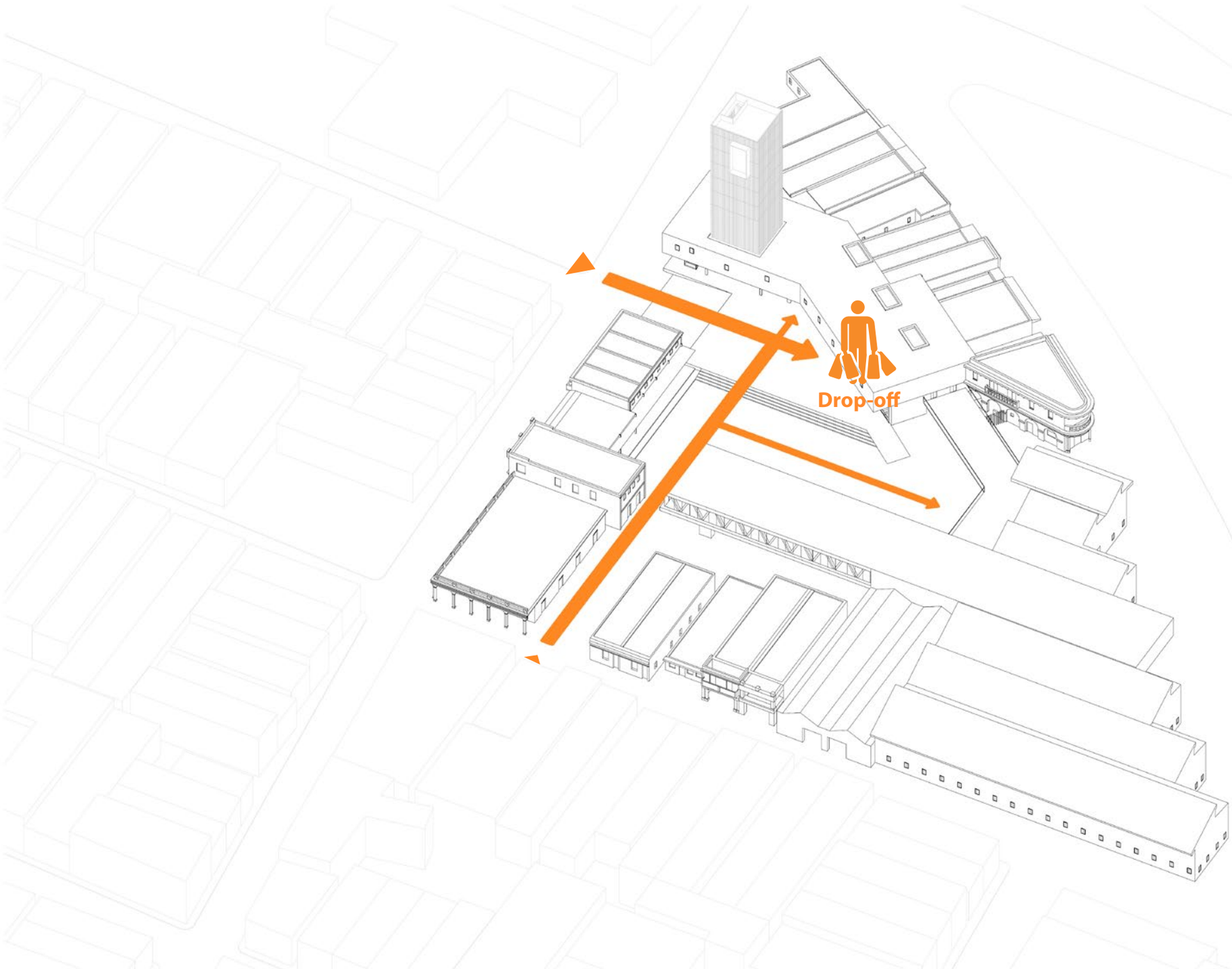
New and Old - Industrial



New

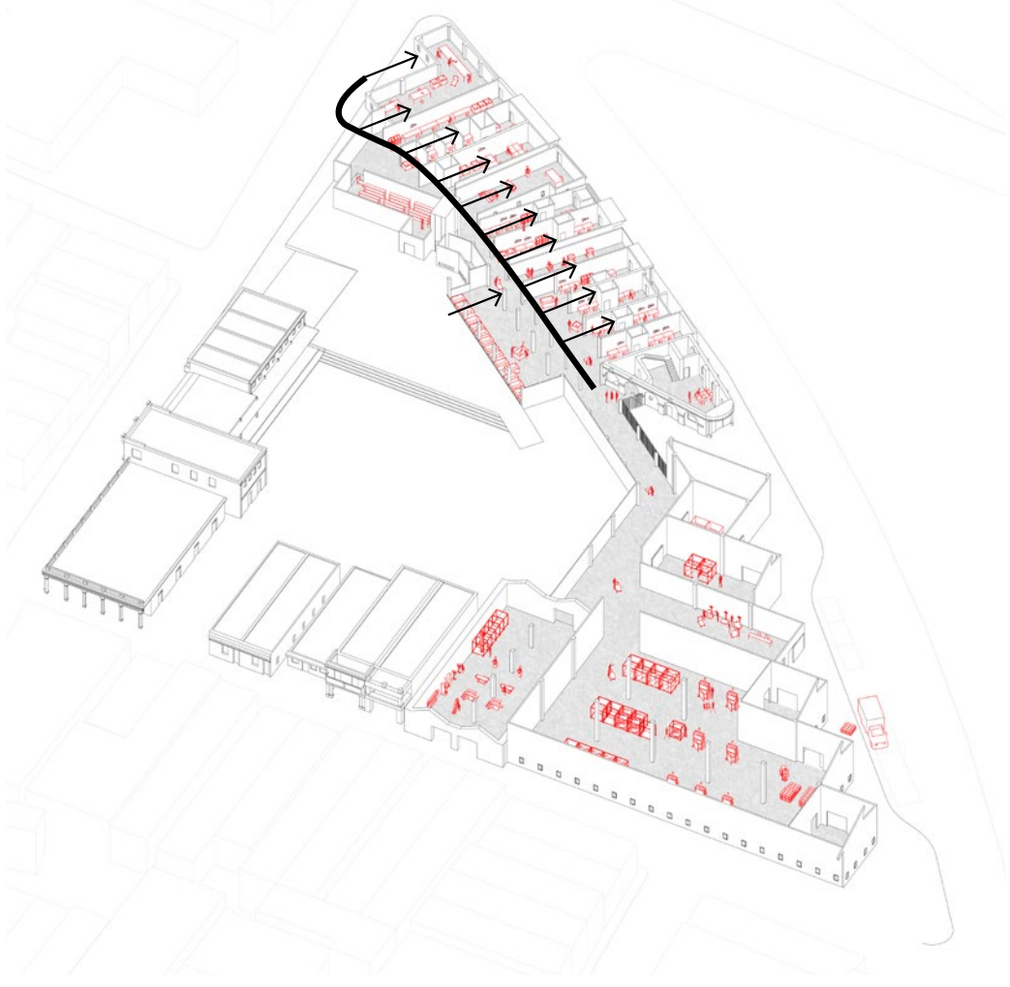
Existing

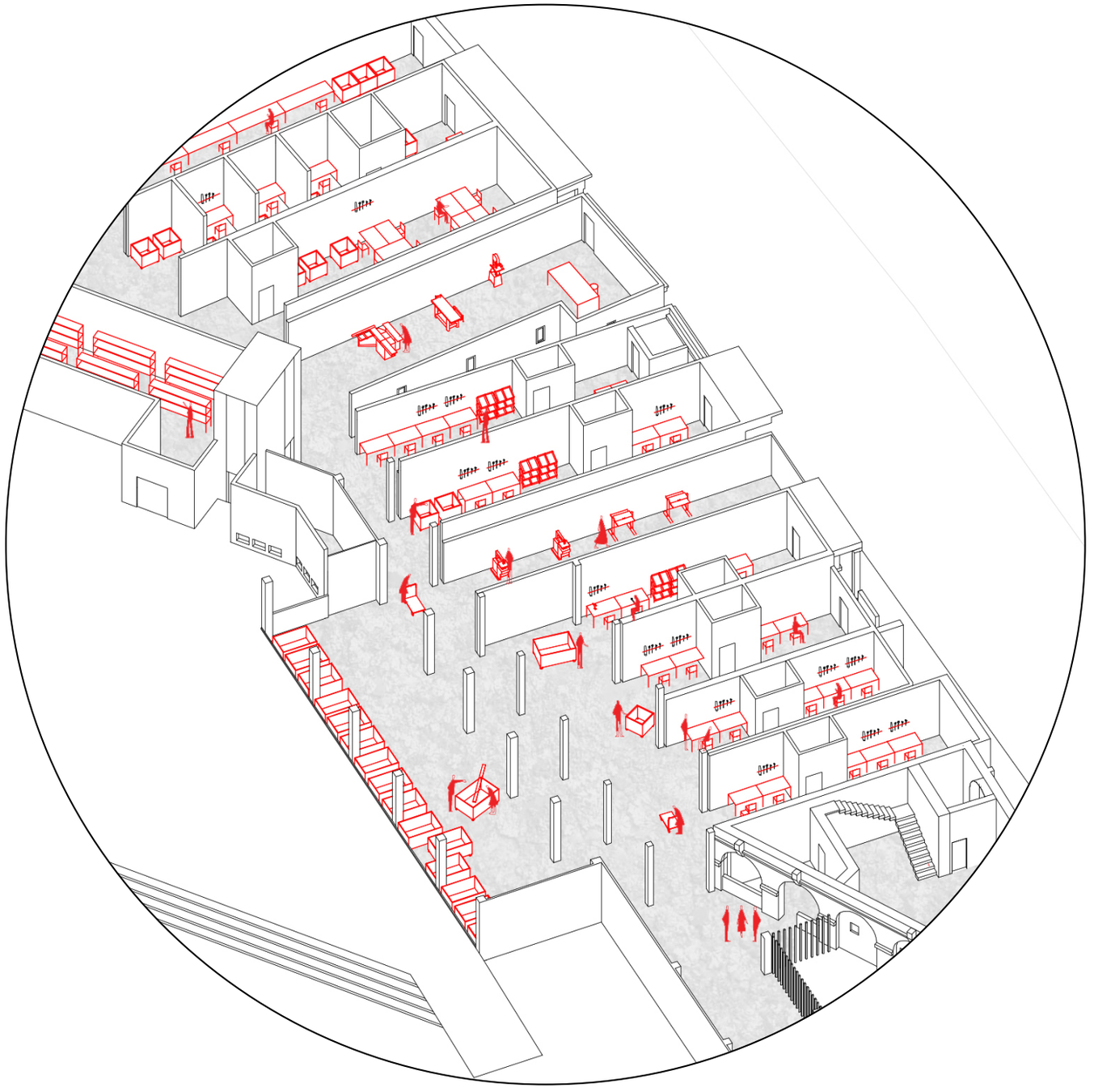
Circulation Axis



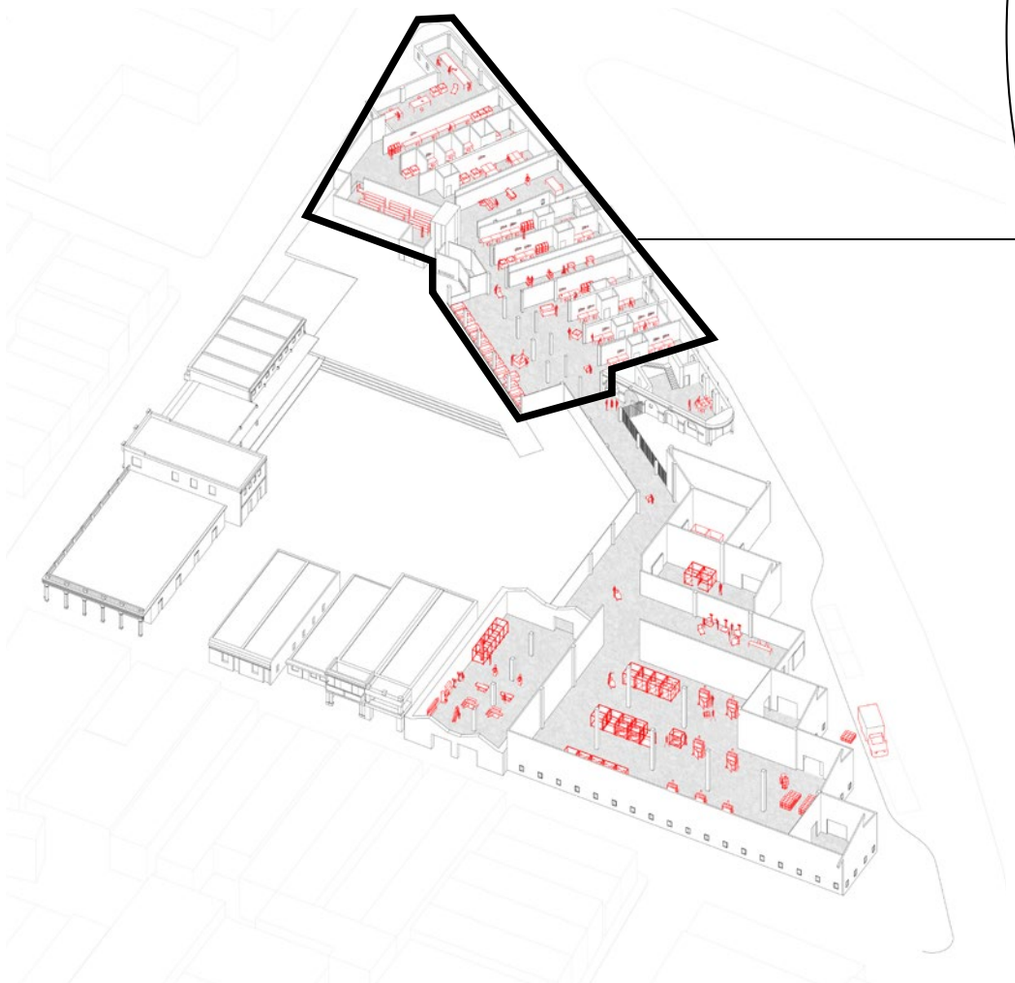
Industrial

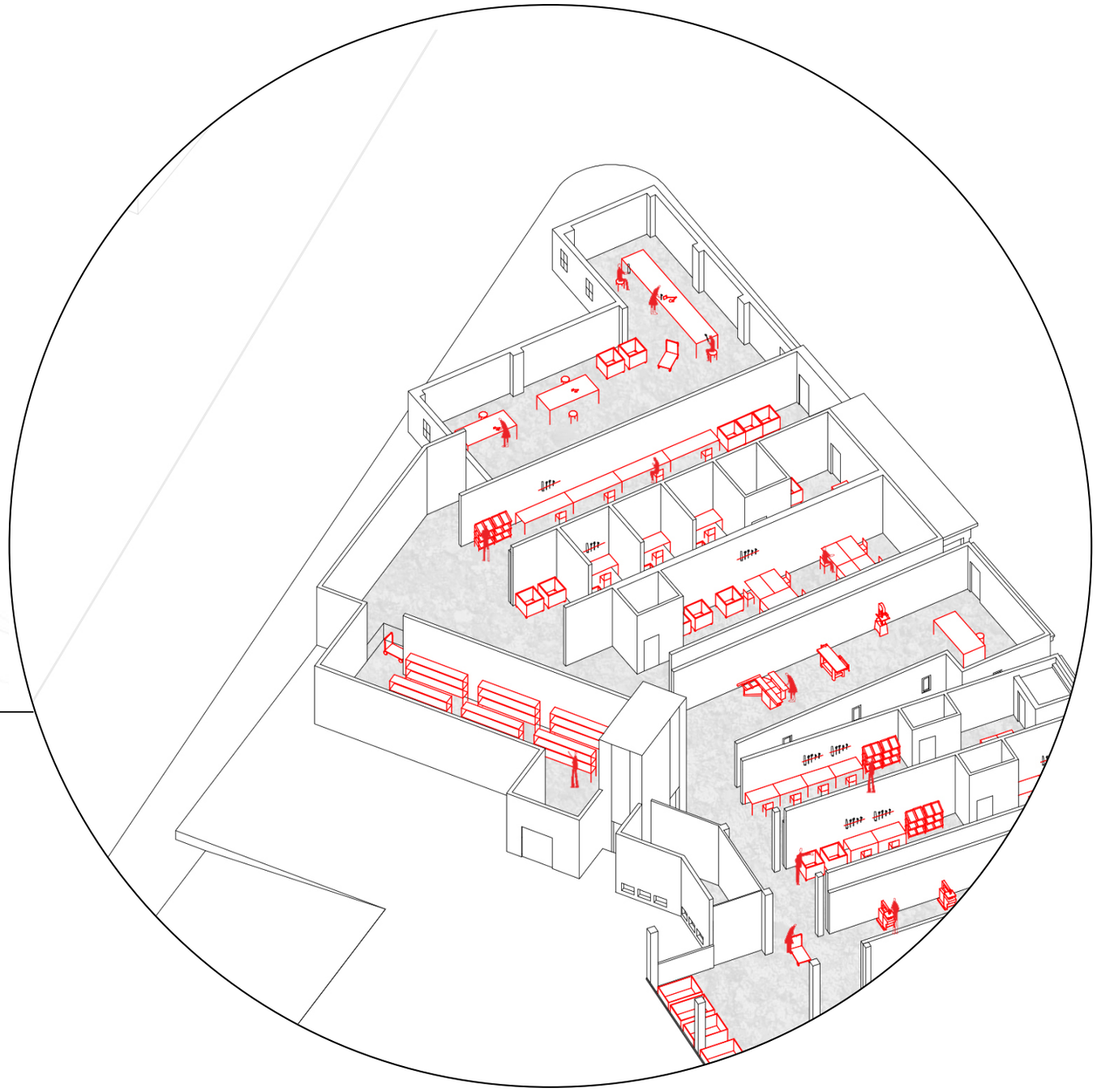
Industrial - Disassembly Station





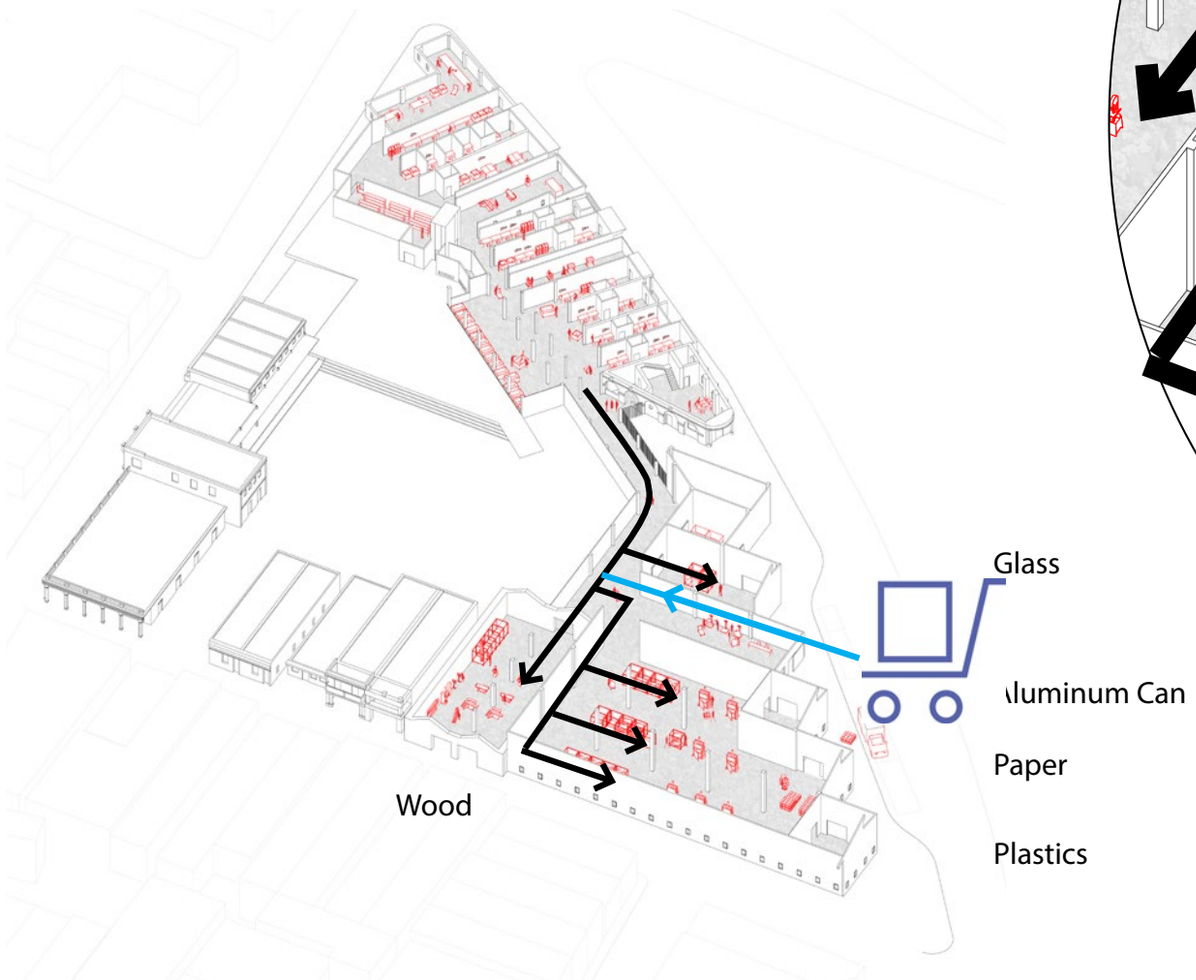
Industrial - Repair Station

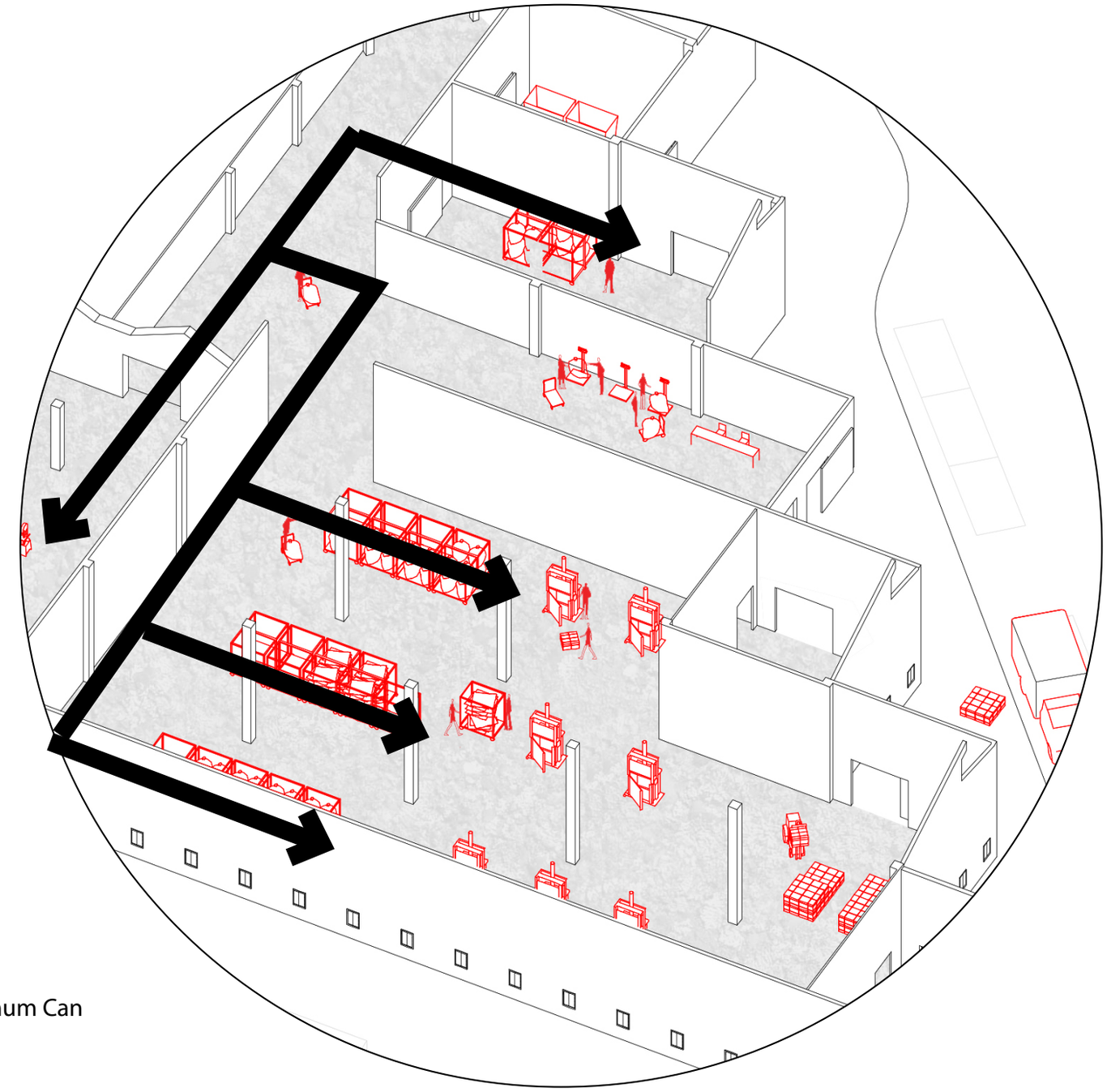




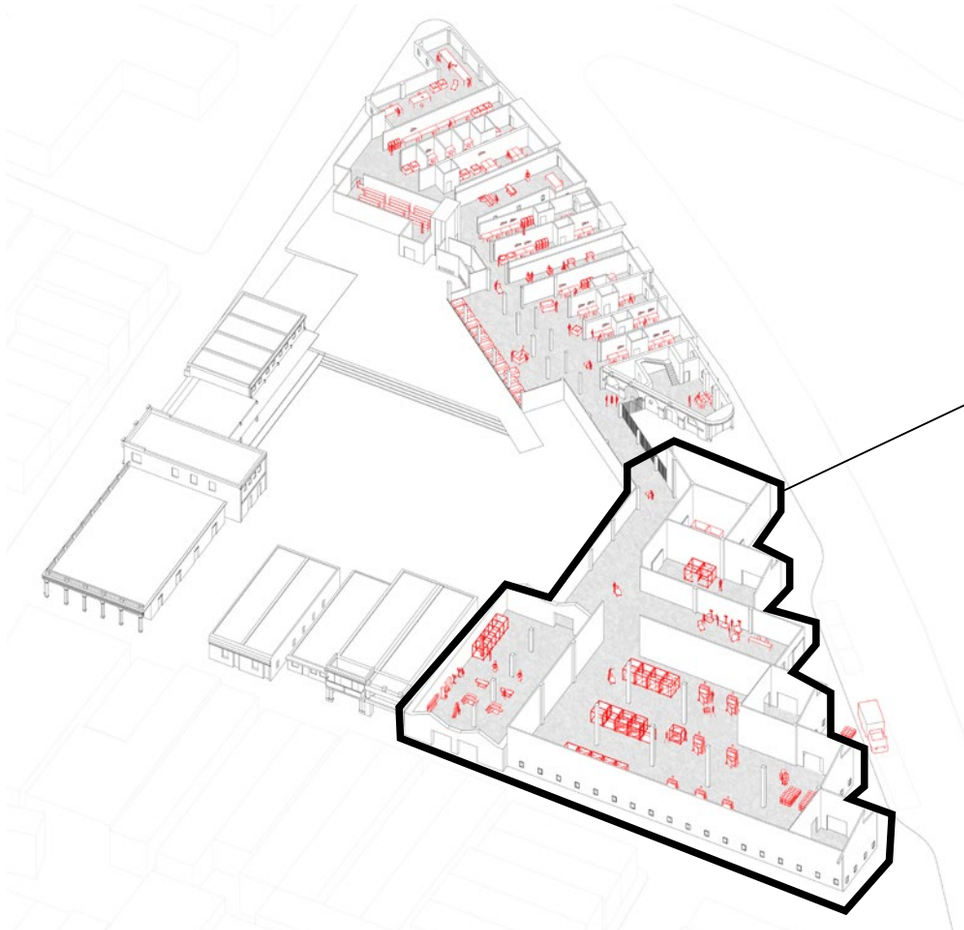
Impression - Warehouse and Repair Station

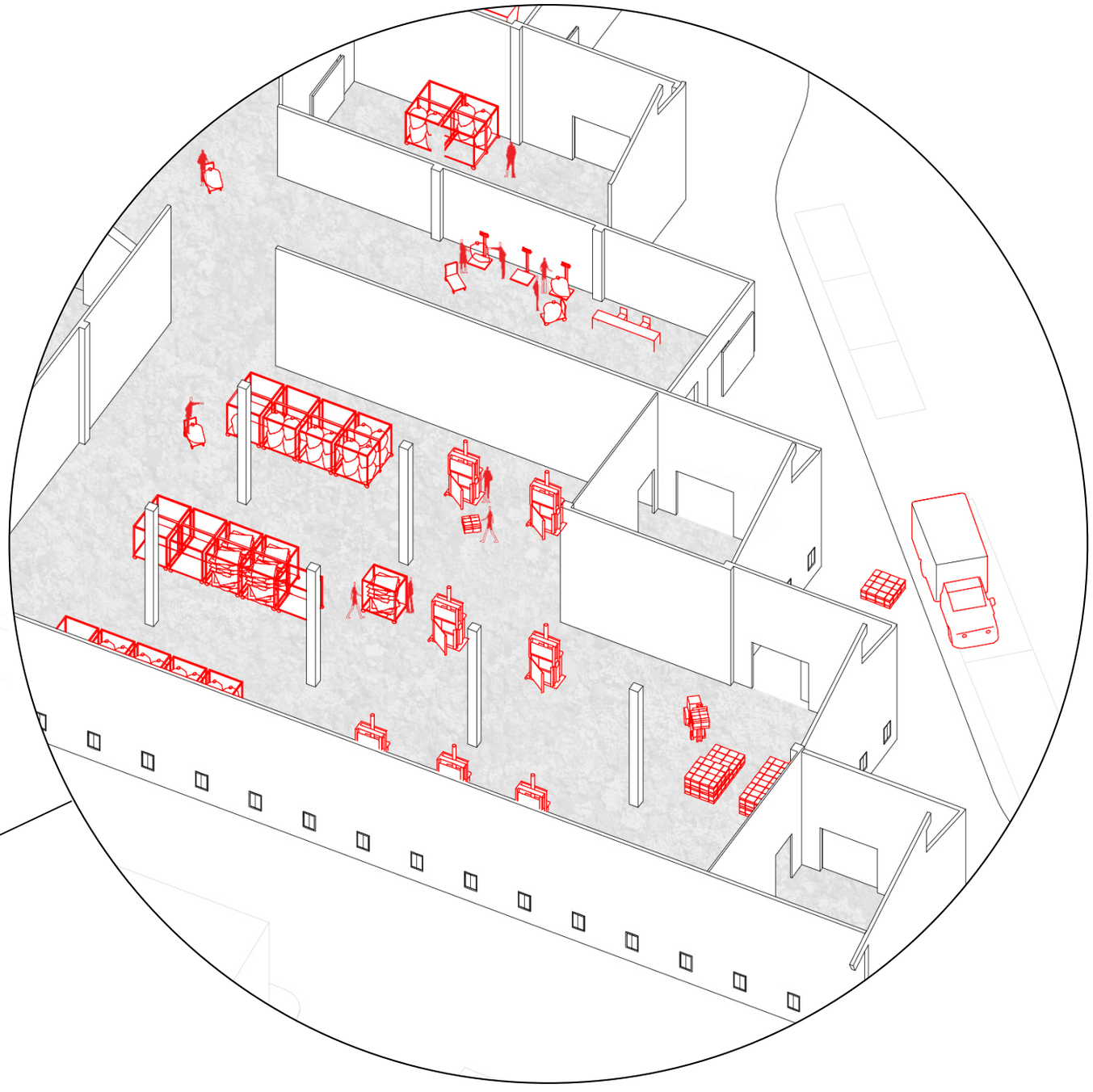
Industrial - Baling Area

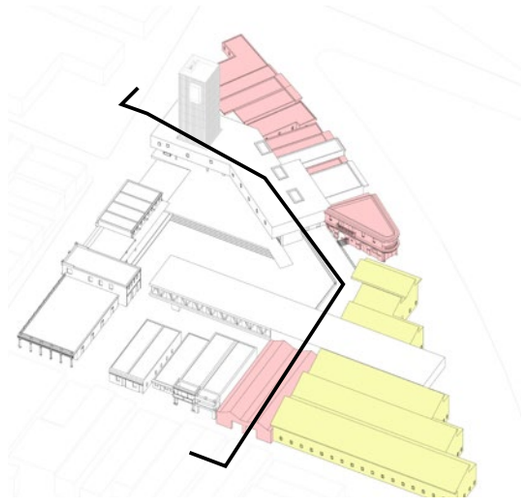


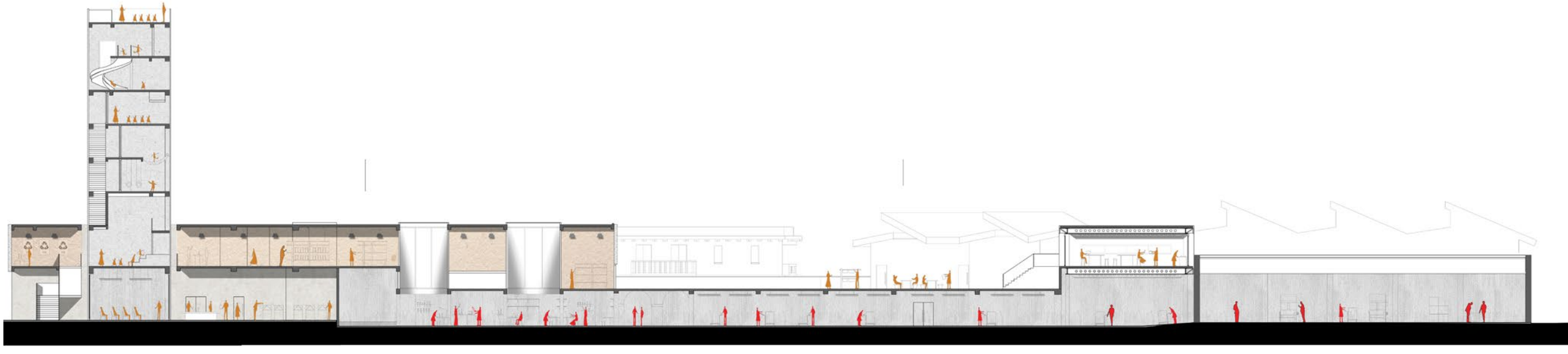


Industrial - Baling Area

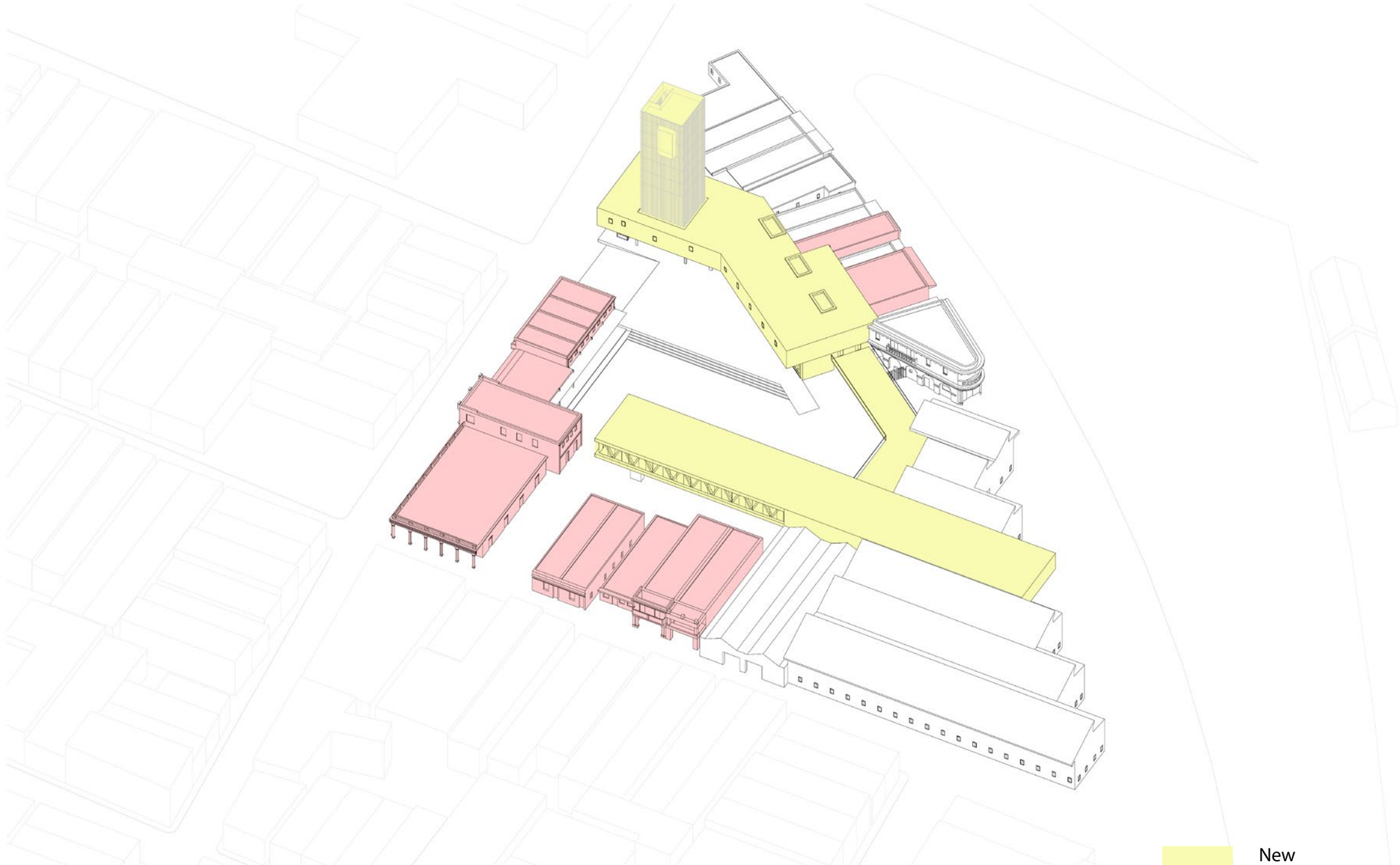








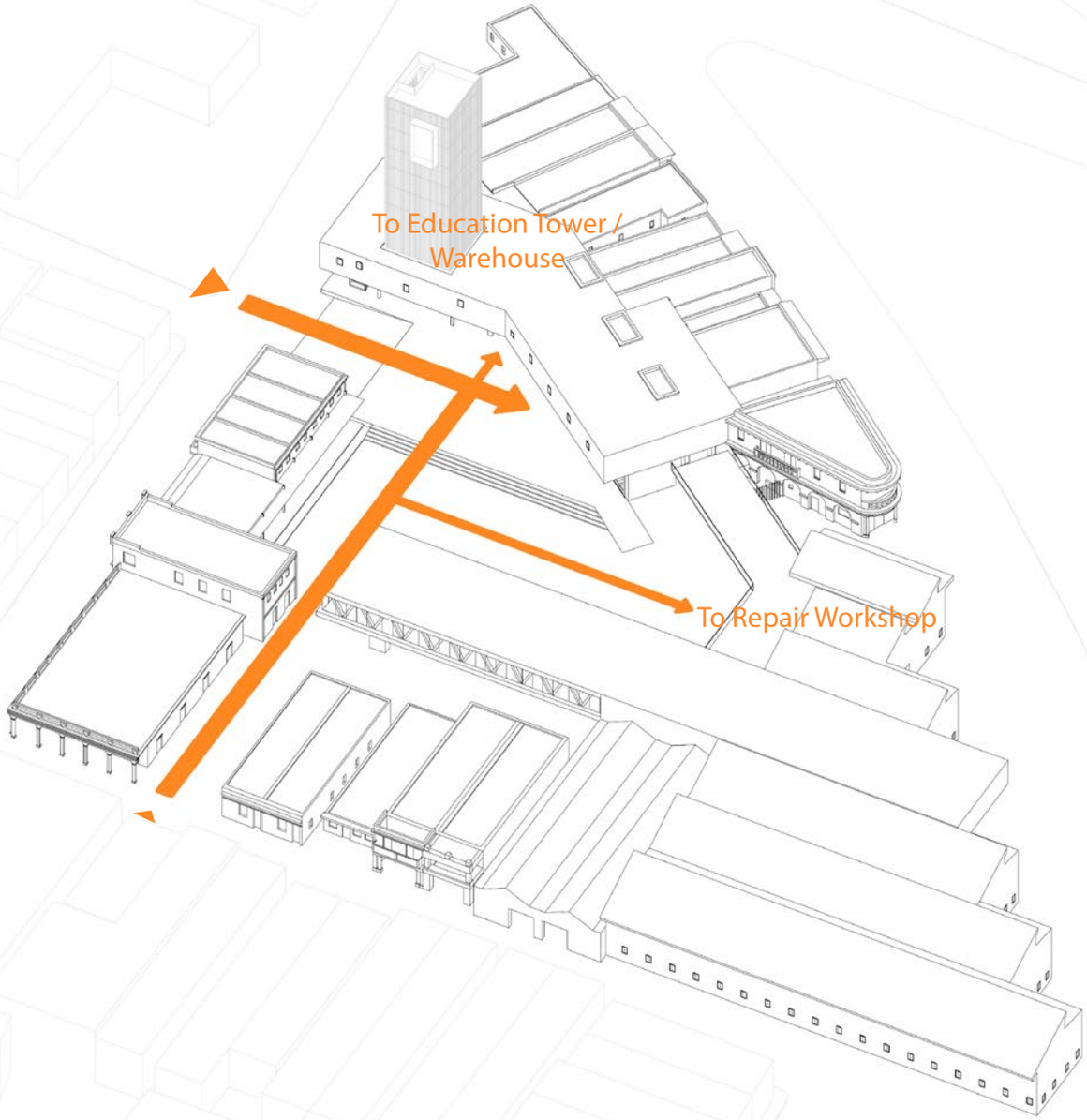
New & Old - Communal



New

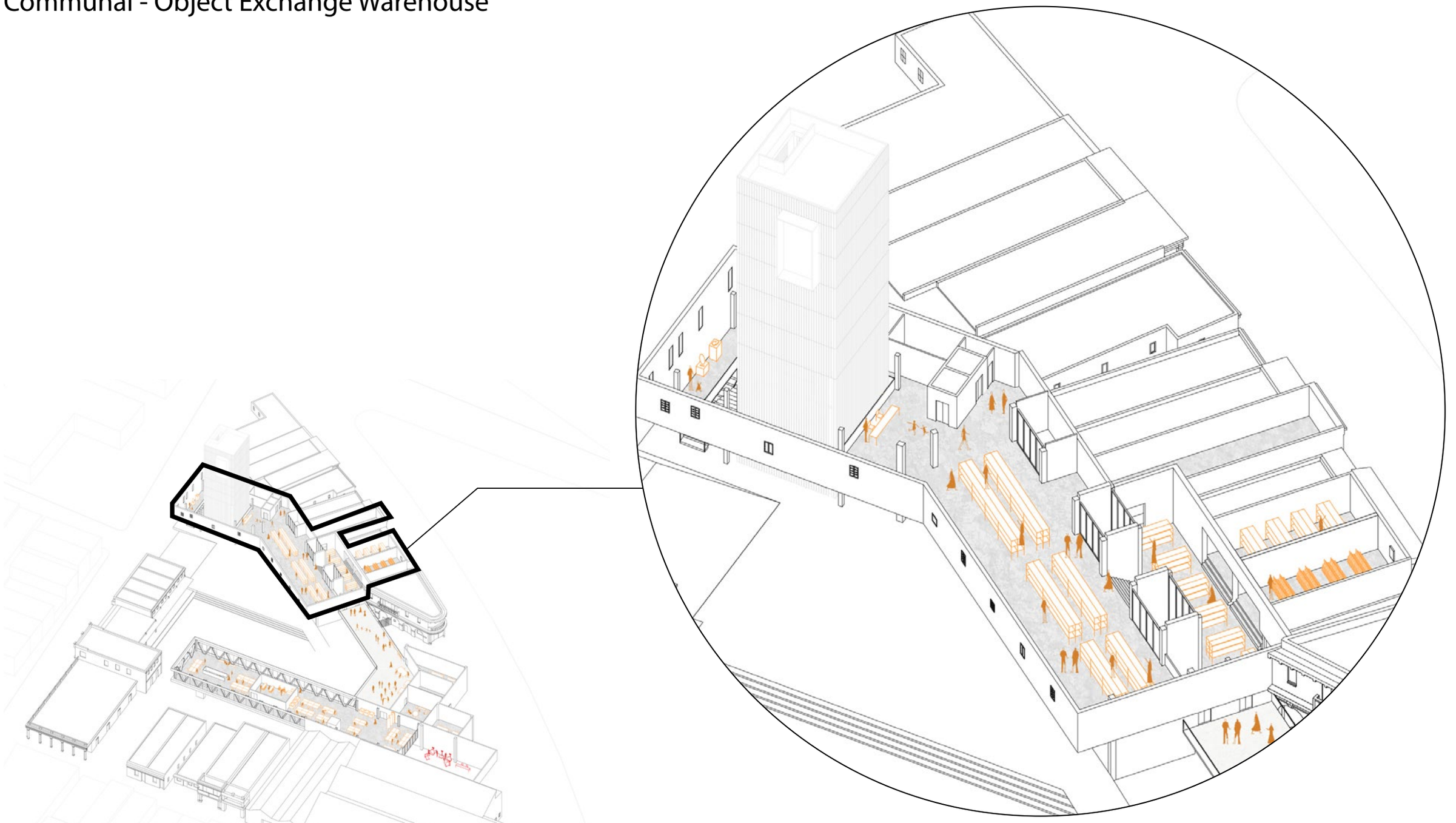
Existing

Circulation Axis

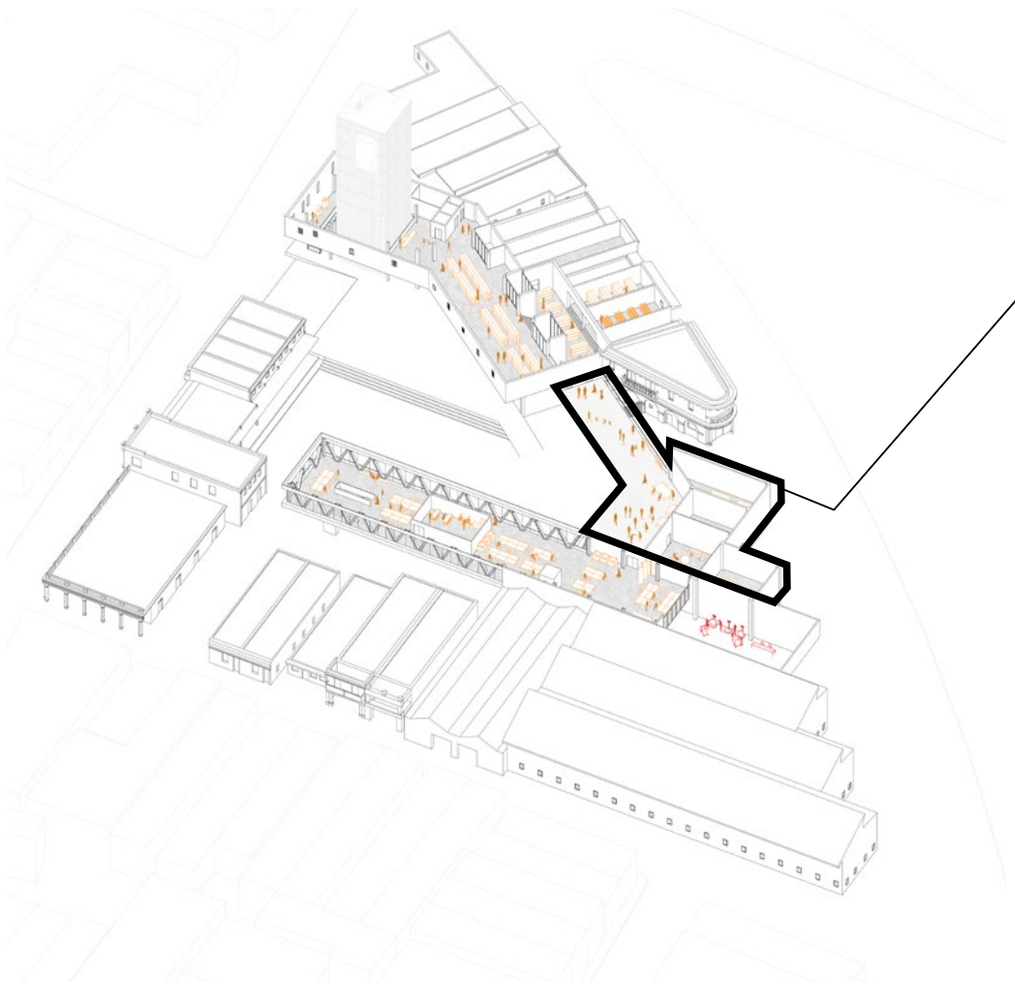


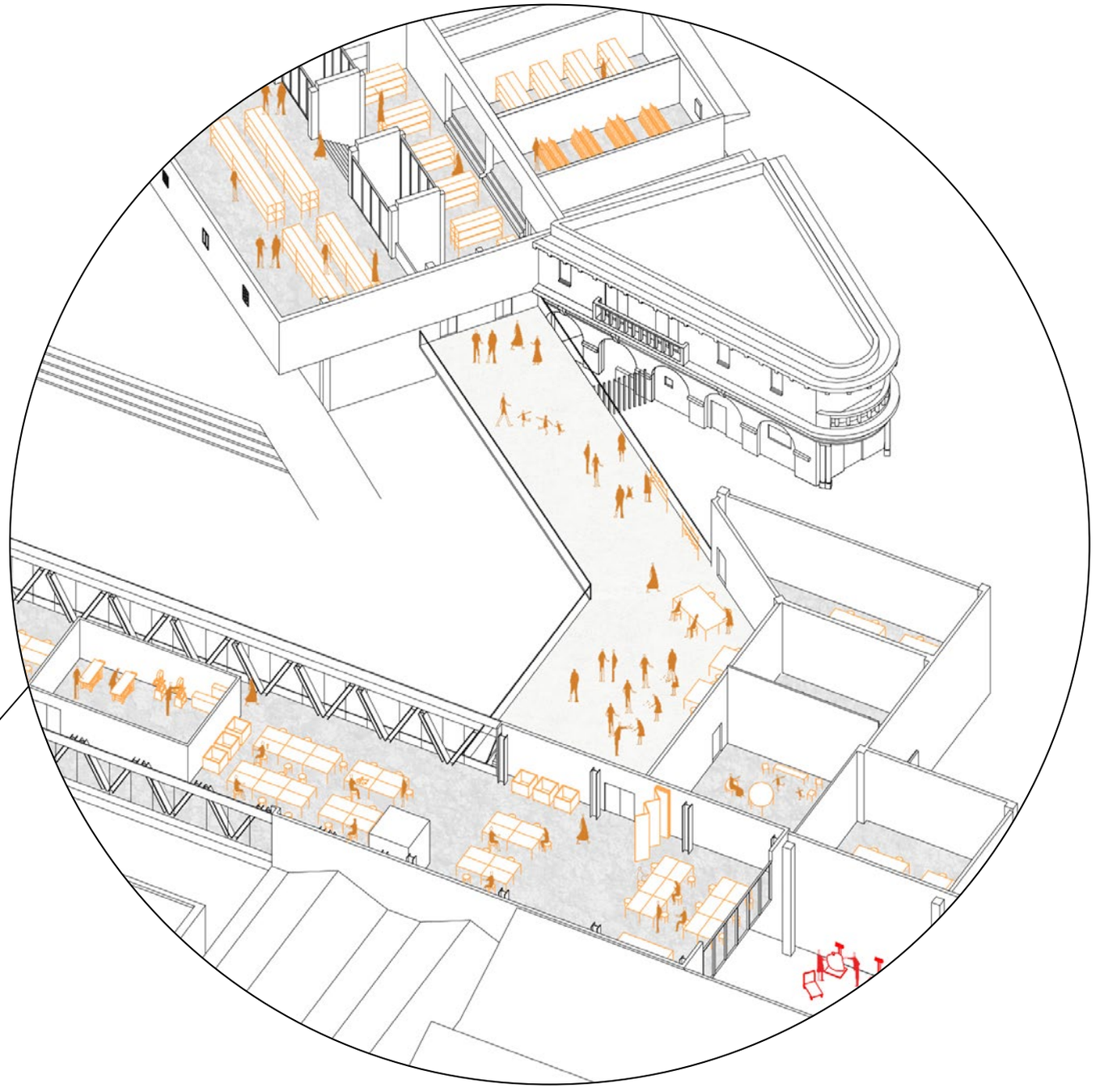
Impression - Drop-off Point

Communal - Object Exchange Warehouse

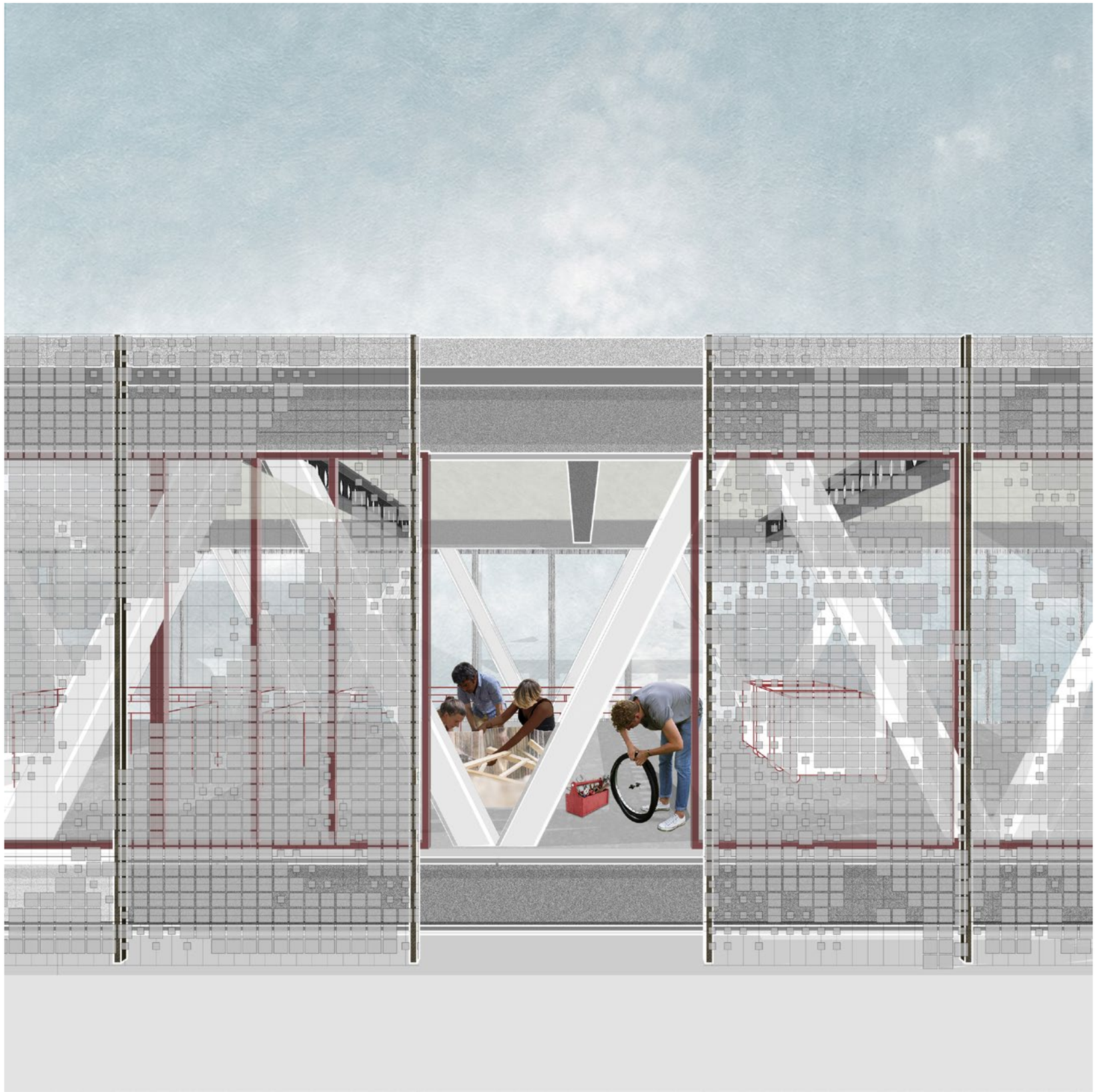


Communal - Upcycle Workshop

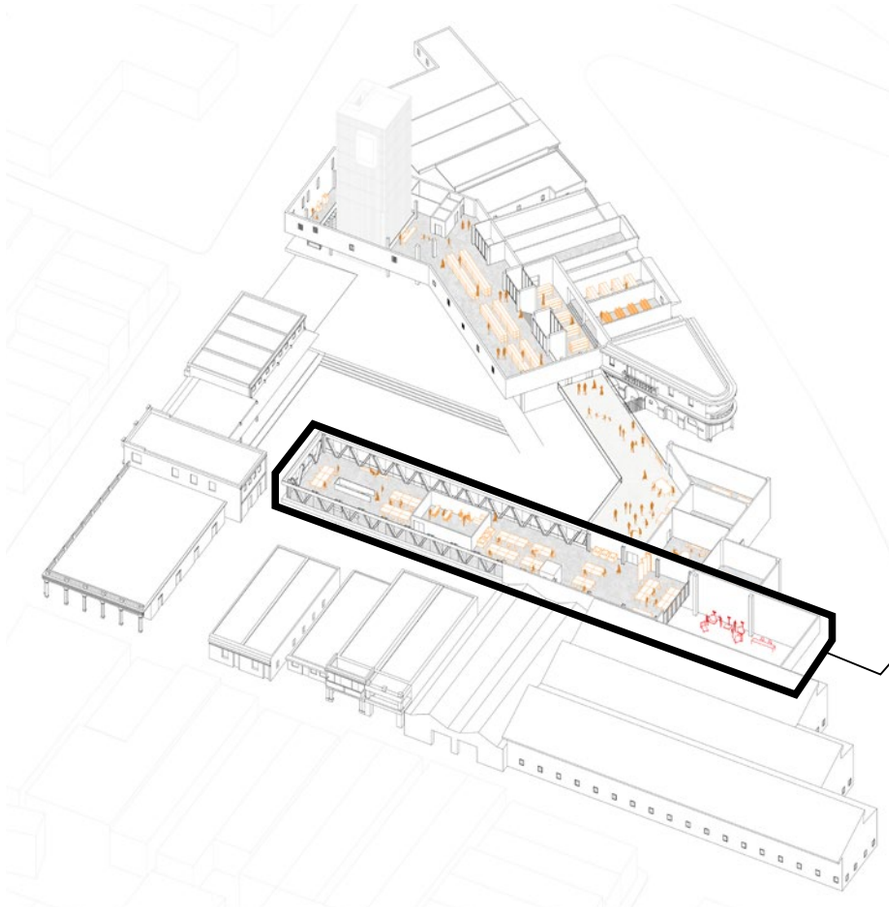


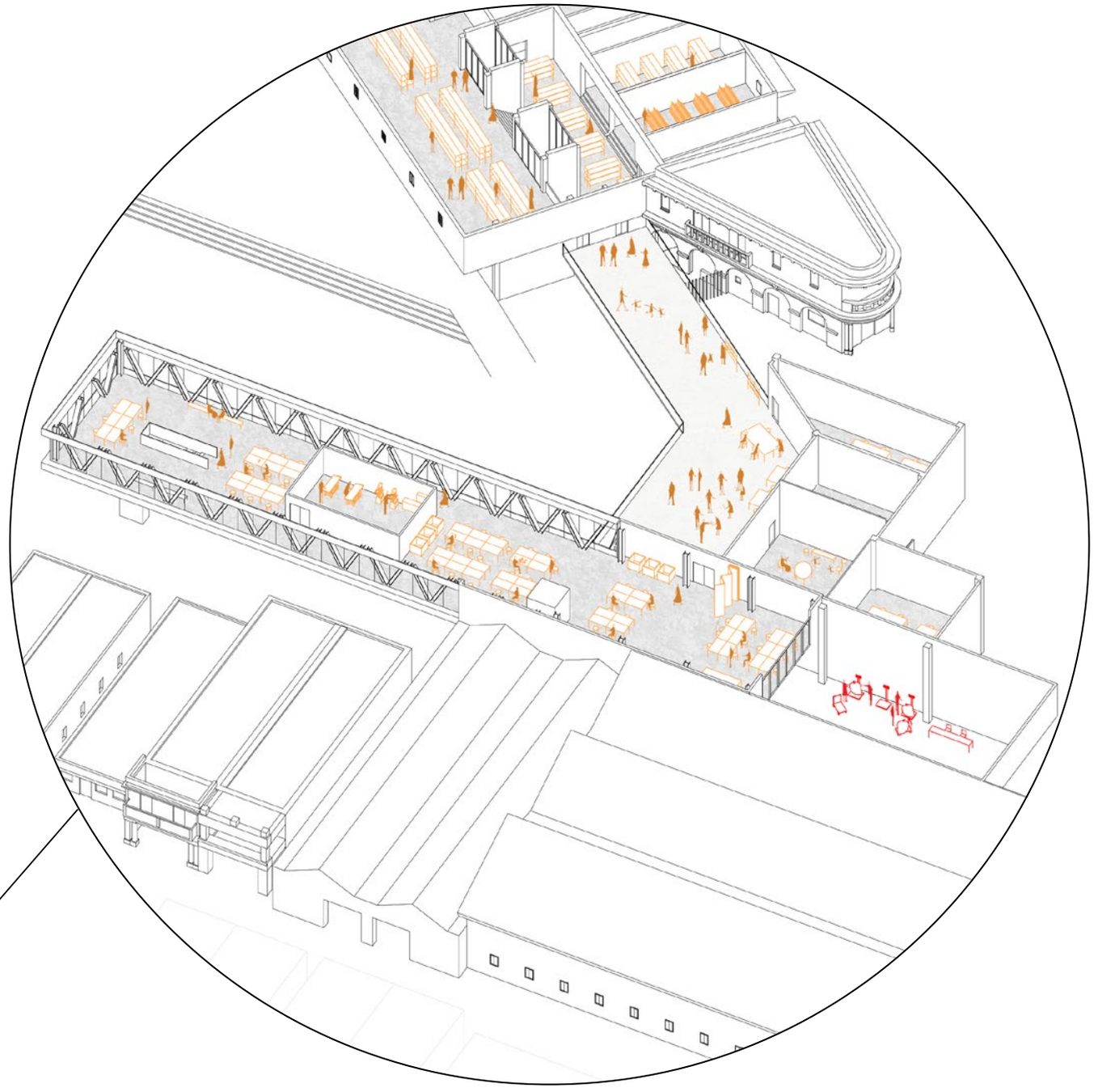


Impression - Repair Workshop

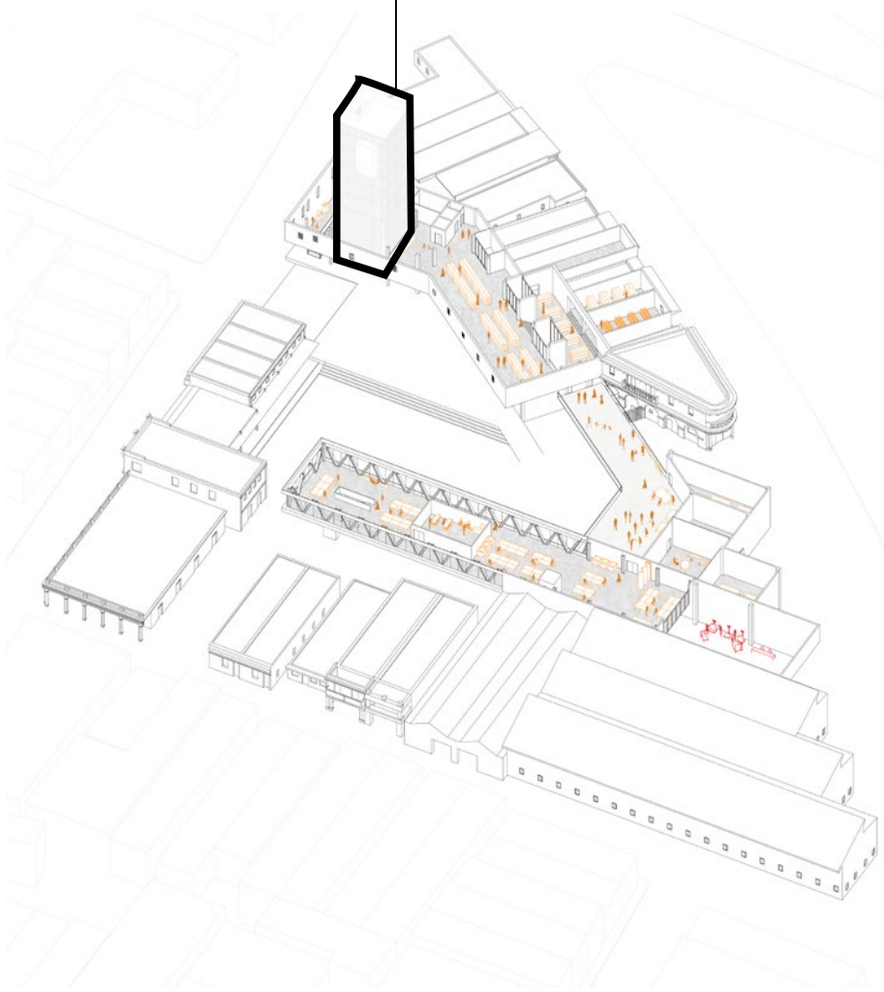


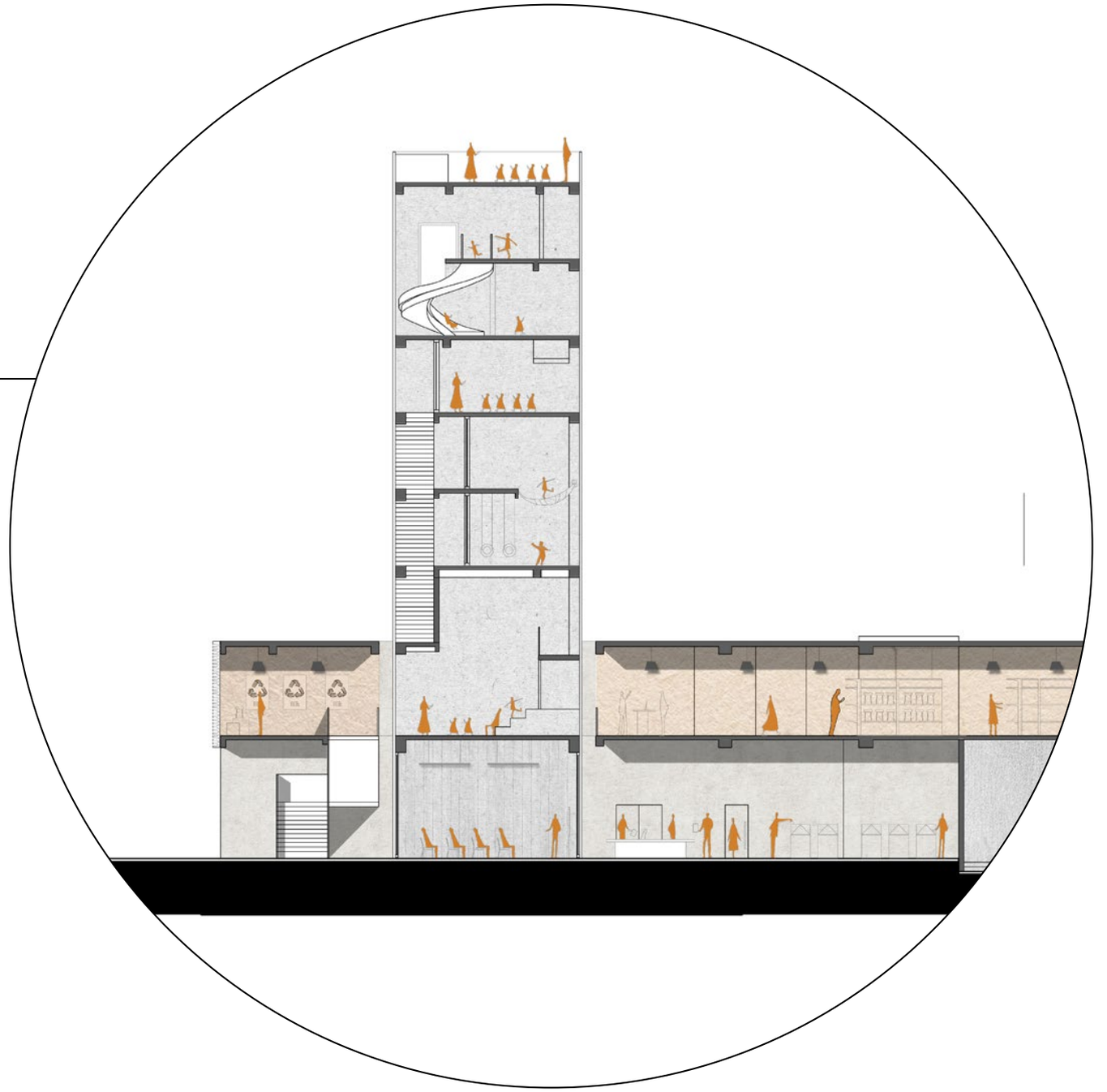
Communal - Repair Workshop





Communal - Education Tower

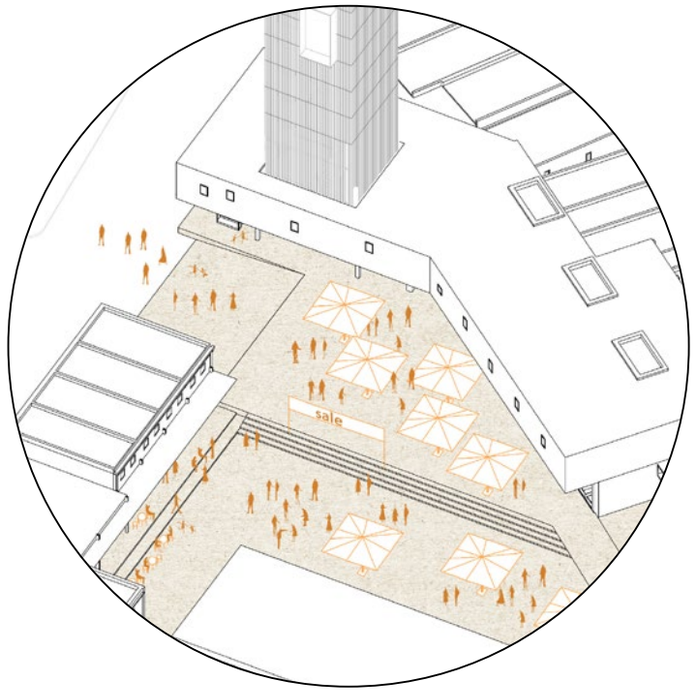




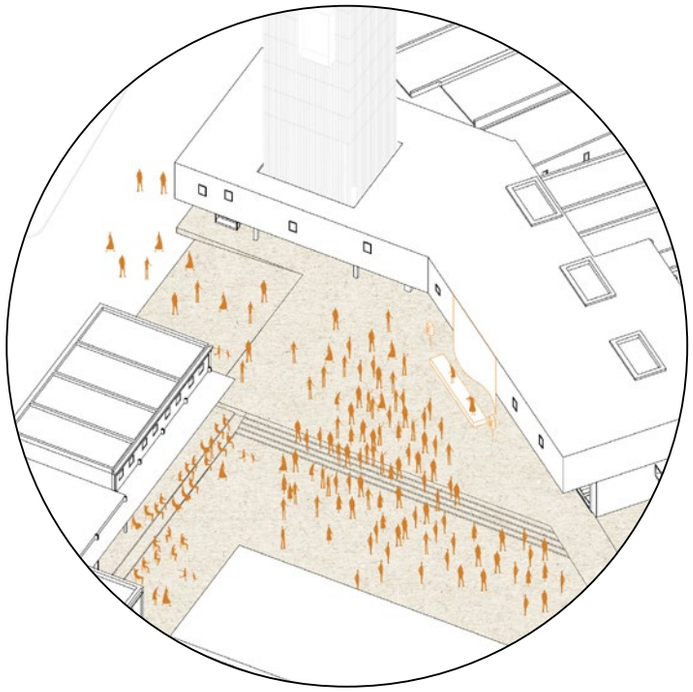
Impression - Cafe

Impression - Cafe

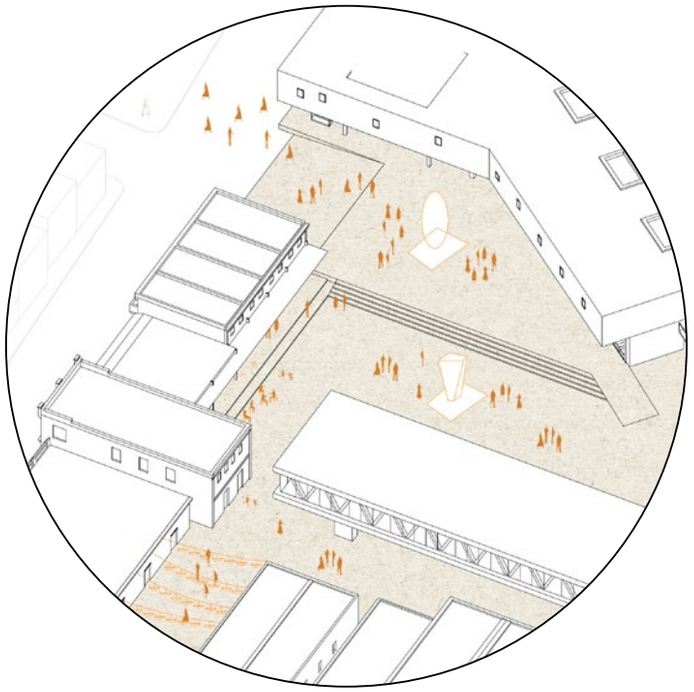
Communal - Event Plaza & Art Passage



Sunday Market /
Seasonal Clearance

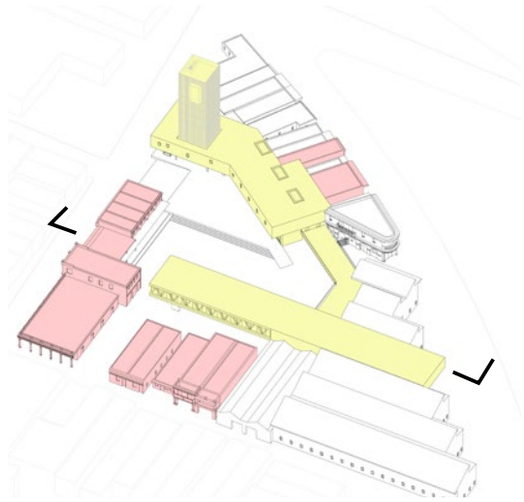


Music Event at Night



Recycled Art Exhibition

Impression - Exhibition Plaza

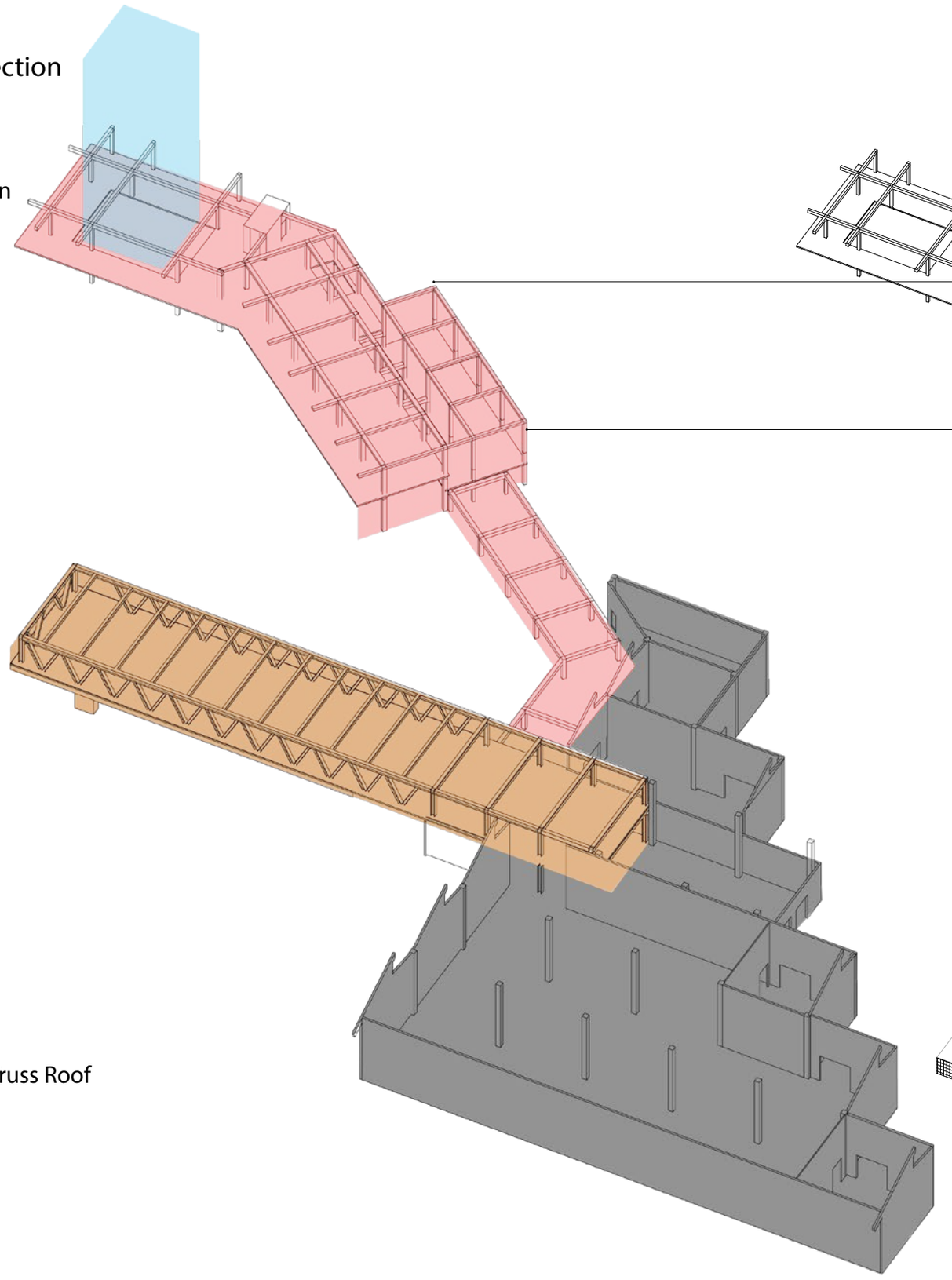



WORKER,
BUILD YOUR
OWN
MACHINERY!

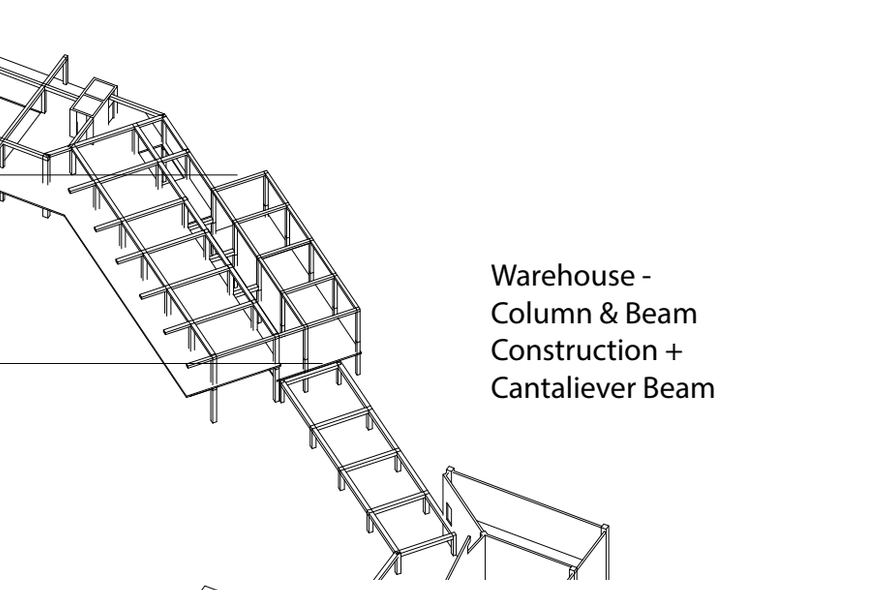
Structural Scheme

4 Individual Structural Section

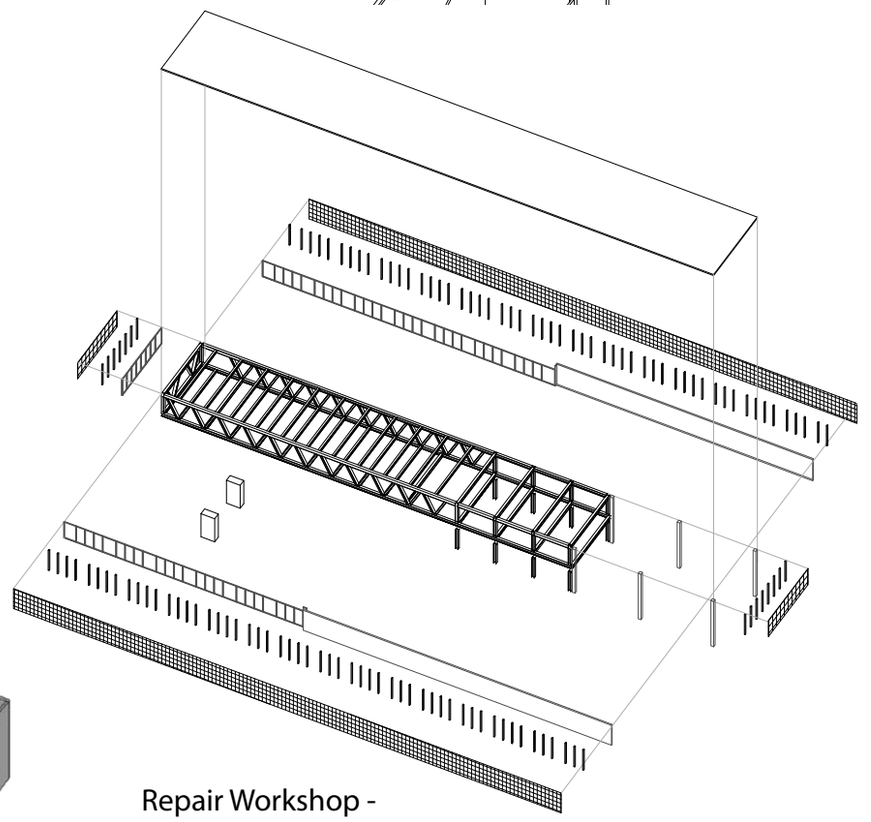
Education Tower -
Column & Beam Construction



Warehouse -
Column & Beam
Construction +
Cantaliever Beam

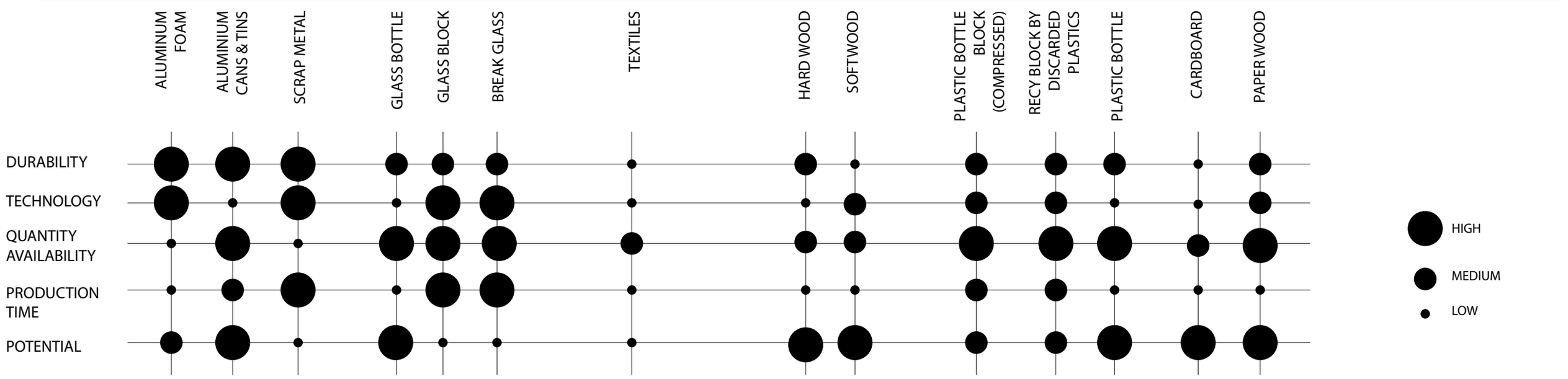


Factory -
Concrete Column and Steel Truss Roof



Repair Workshop -
Vievierndeel Truss + Warren Steel truss +
Giant Concrete Column

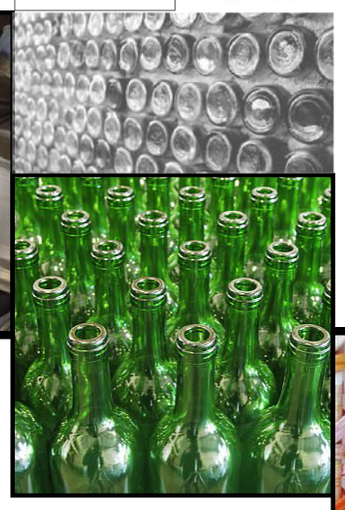
Materialization



Materialization

Exterior

METAL



GLASS

FABRIC

WOOD

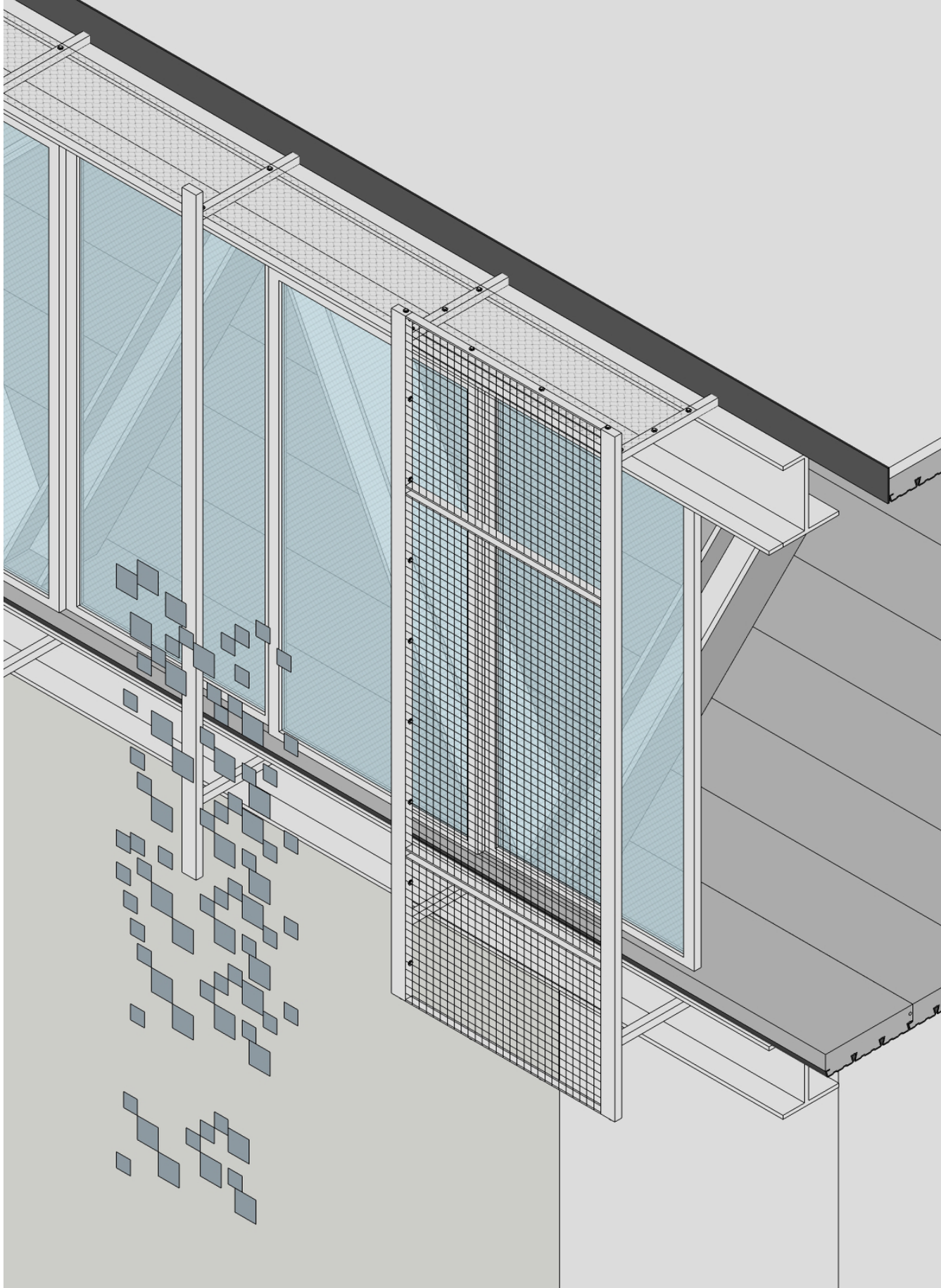
PLASTIC

PAPER

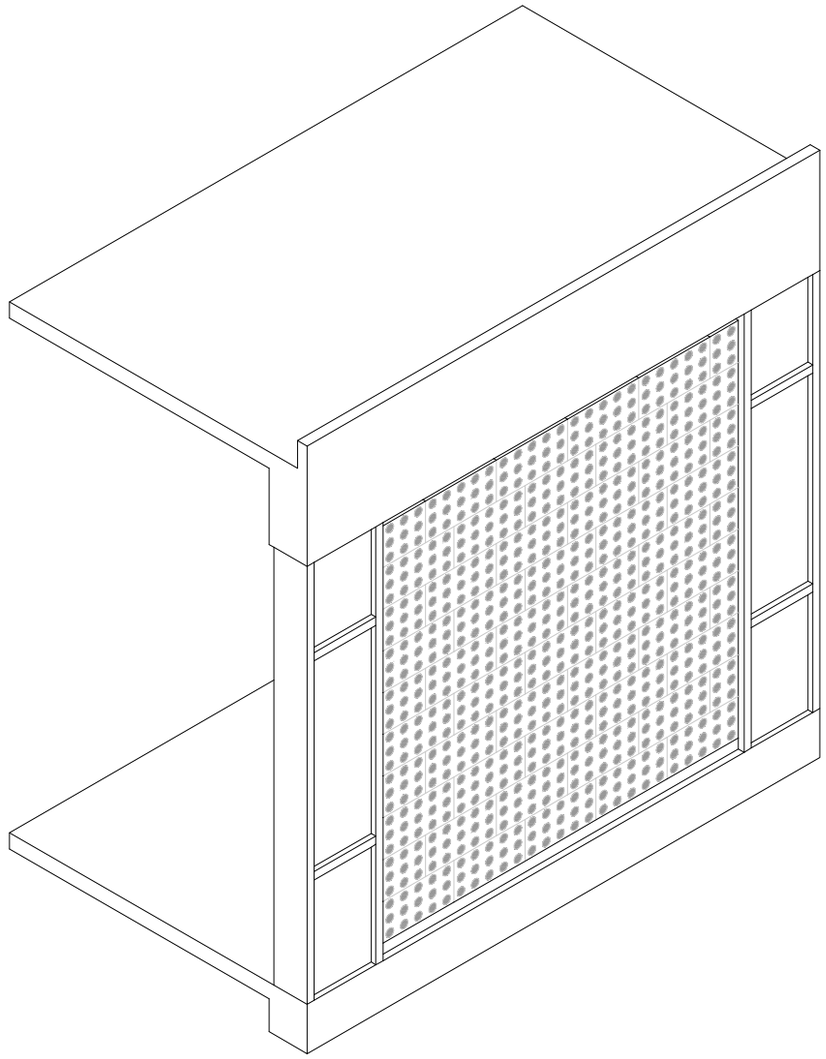
DEMOLITION WASTE

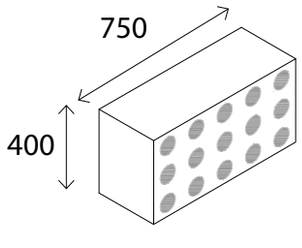
Interior

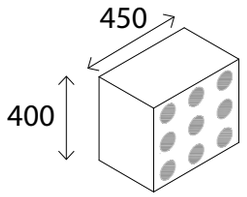
Facade - Recycled Aluminum Screen at Repair Workshop

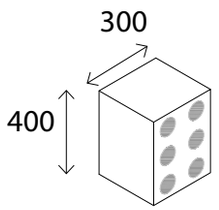


Facade - Glass Bottle Wall at Object Exchange Warehouse

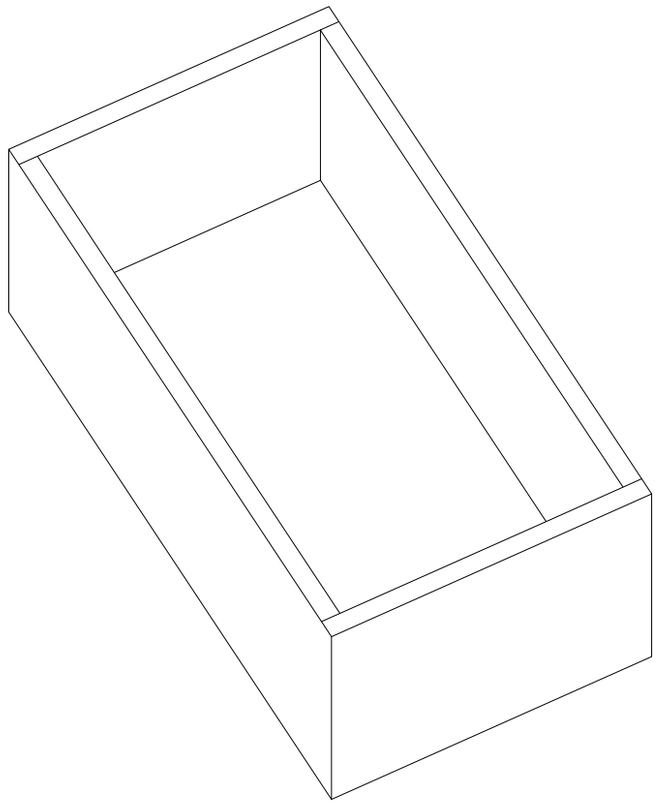




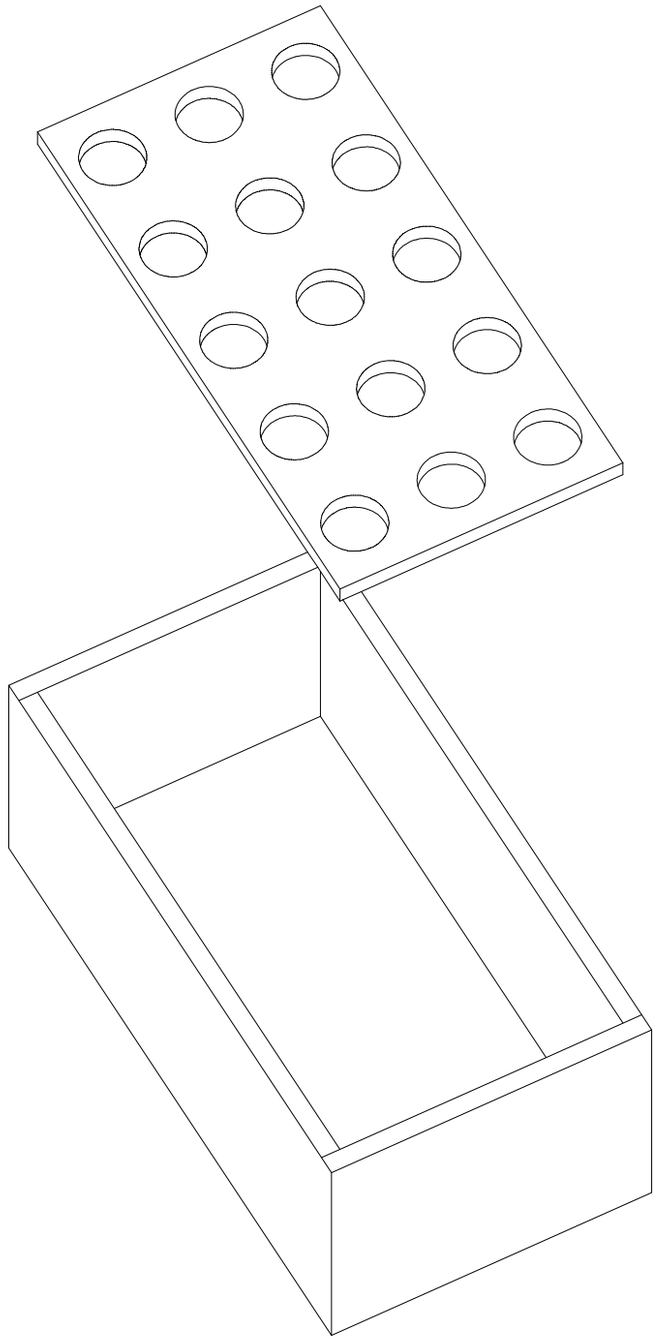




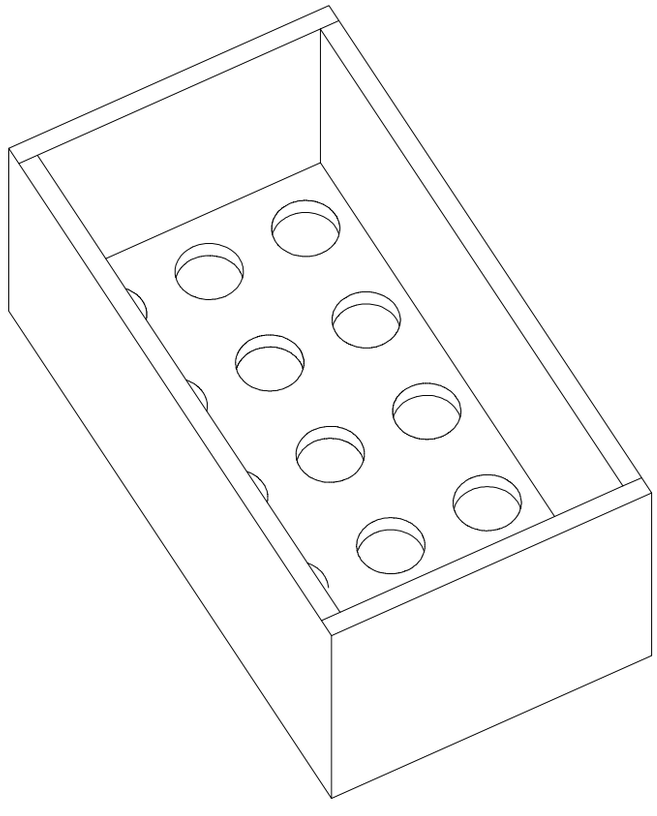
Glass Bottle Facade Module - Formation



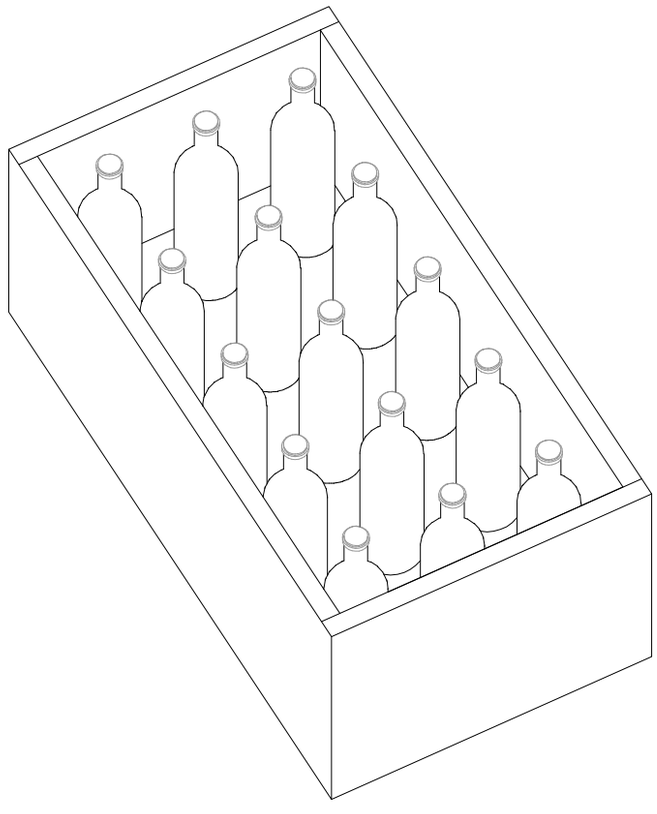
setup formwork



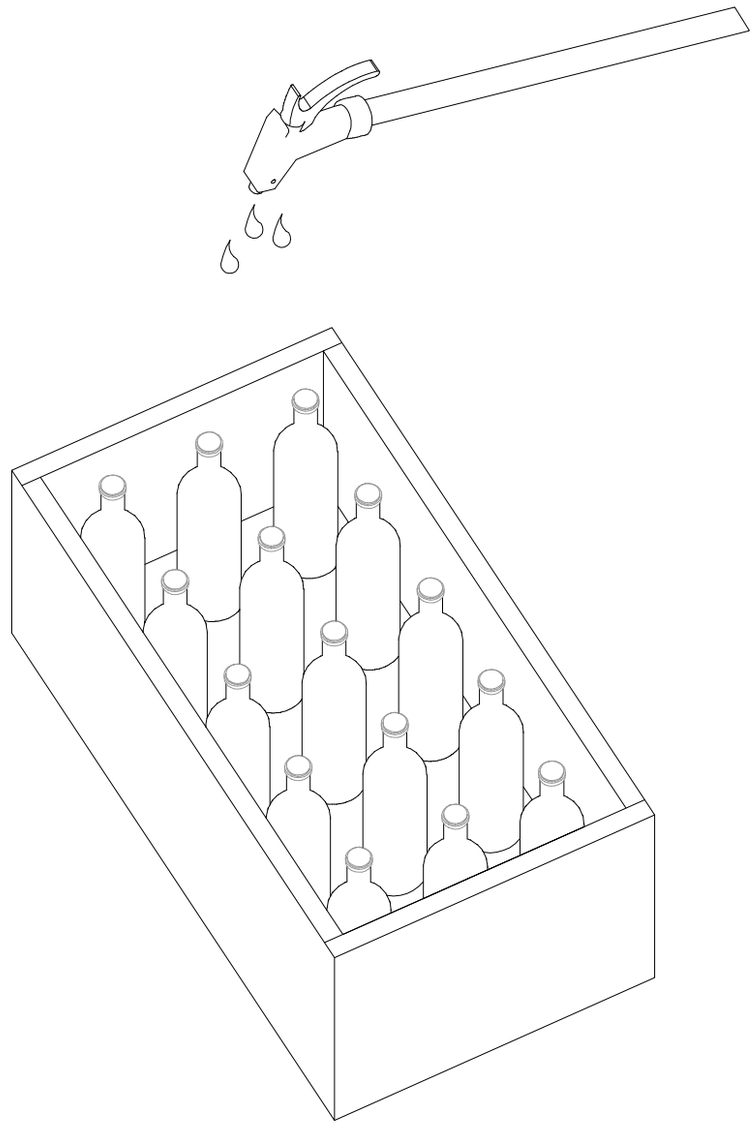
glass bottle base setting



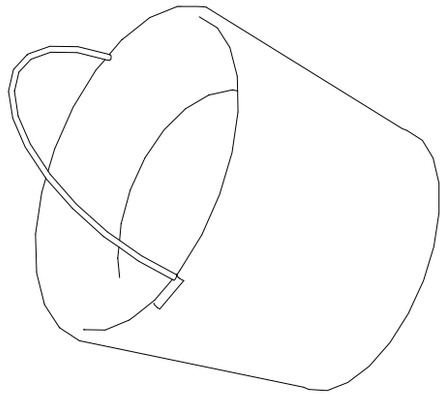
glass bottle base setting



insert glass bottles

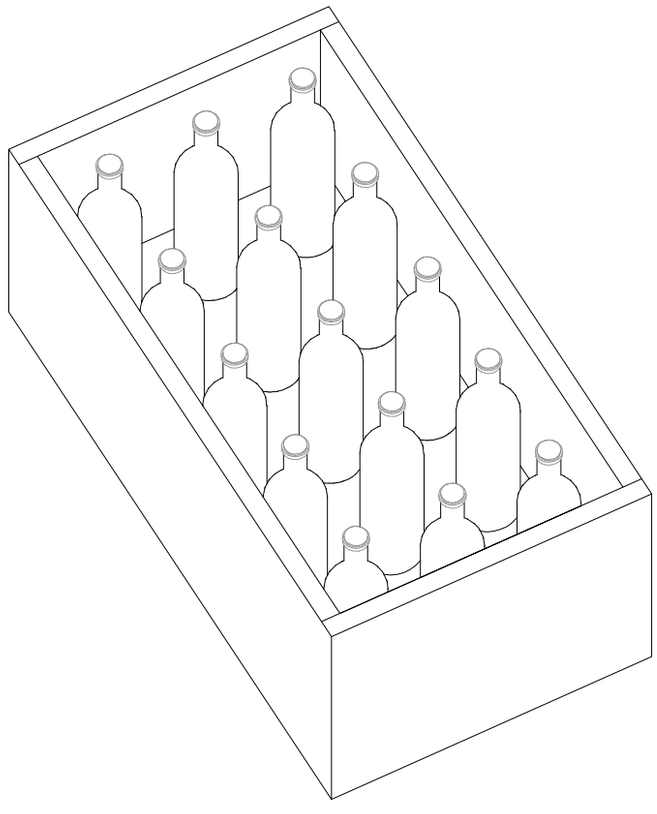


filled bottles with water for stability and capped

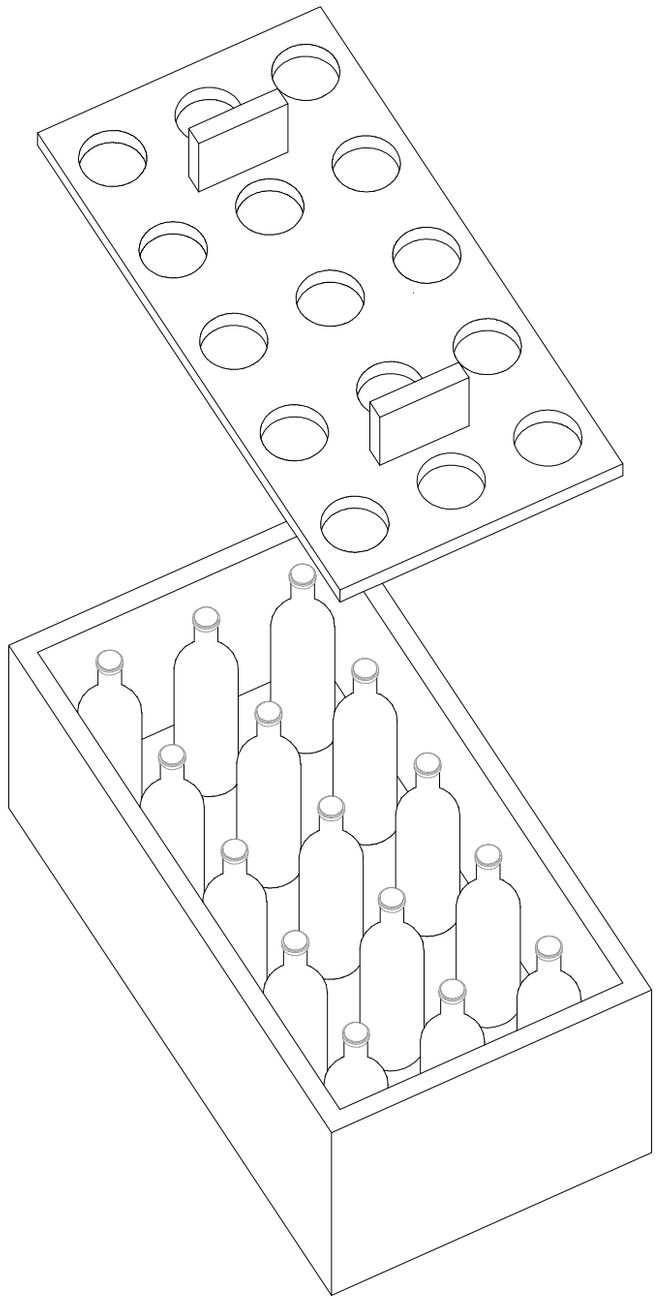


Ratio of Concrete Mixture

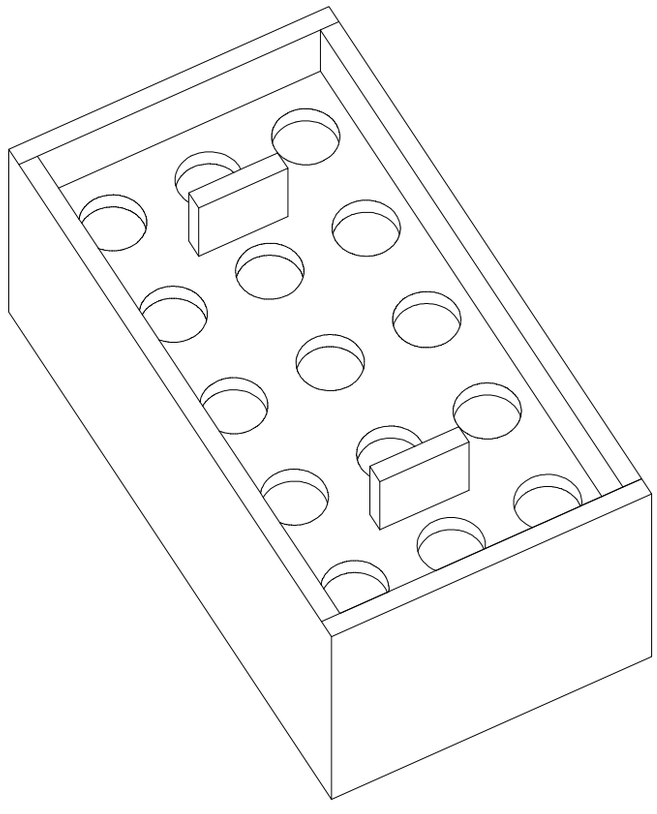
White cement
Sand
Water
Glass Fiber



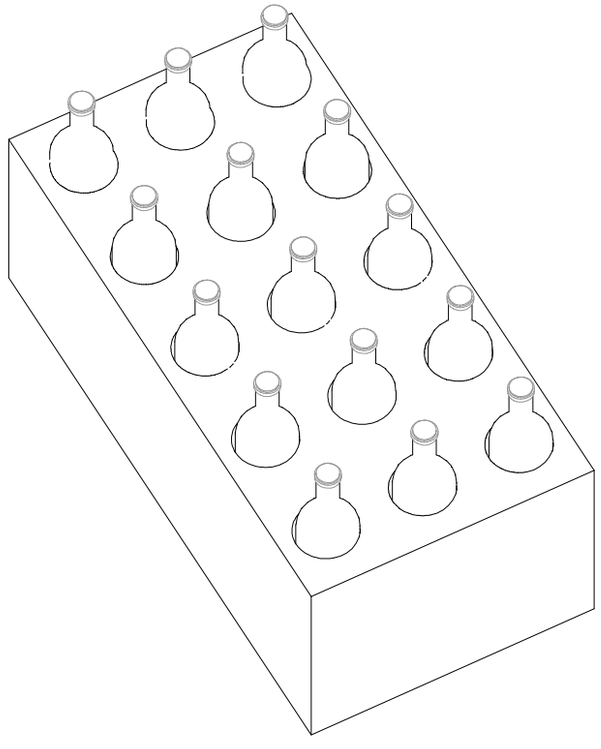
concrete pouring



cover up formwork

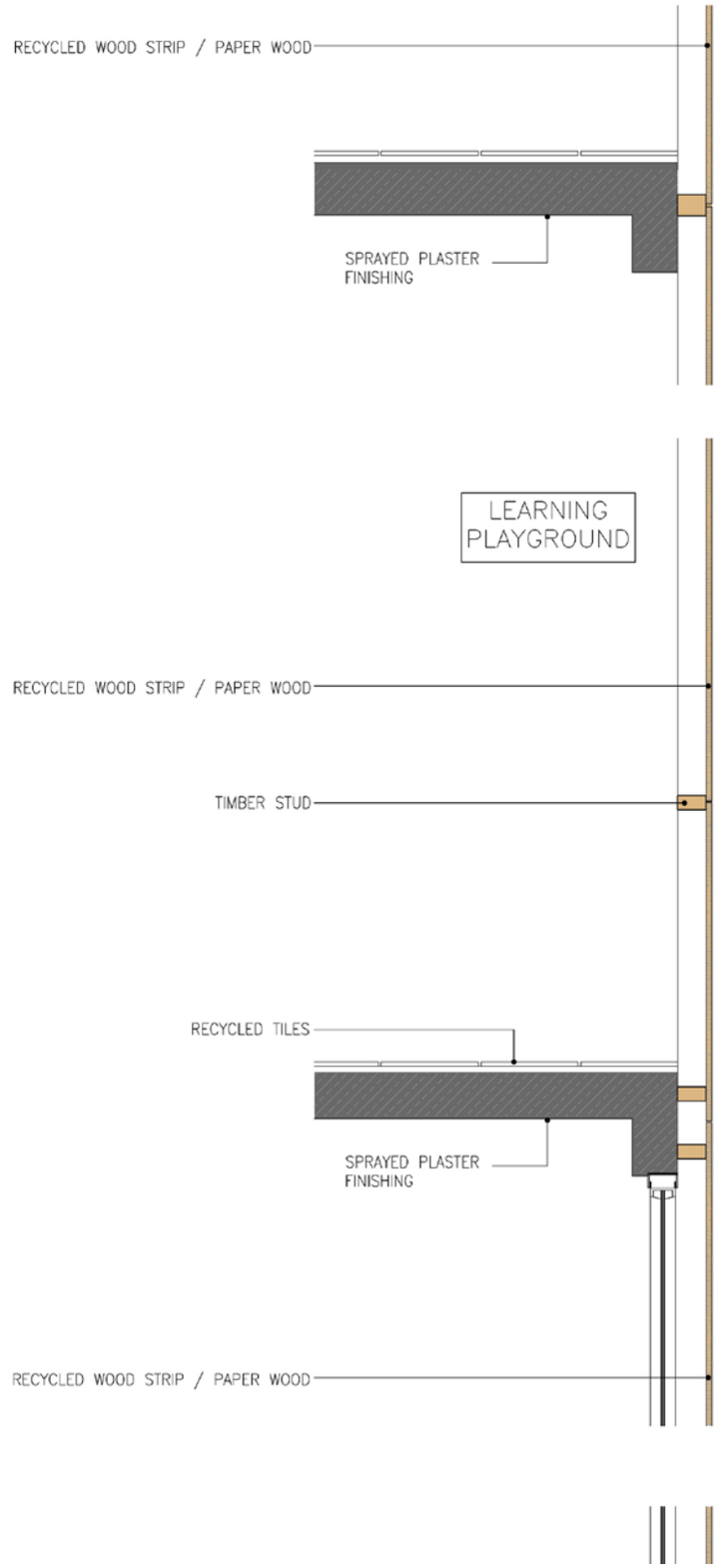


cover up formwork



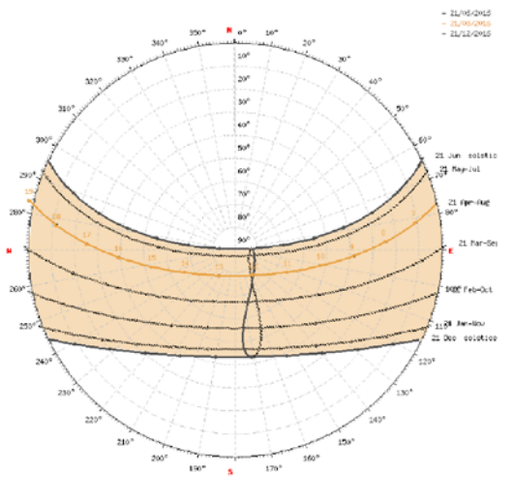
dismantle formwork

Facade - Recycled Wood Cladding at Education Tower



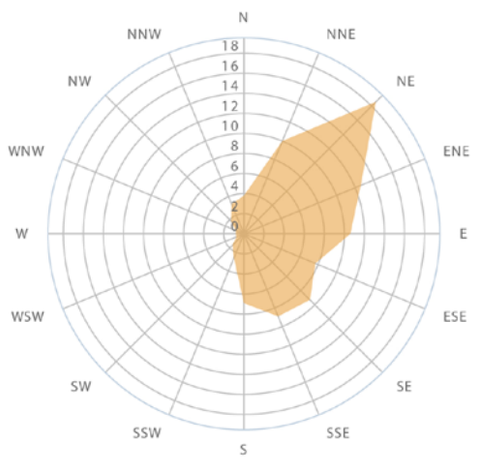
Sustainability

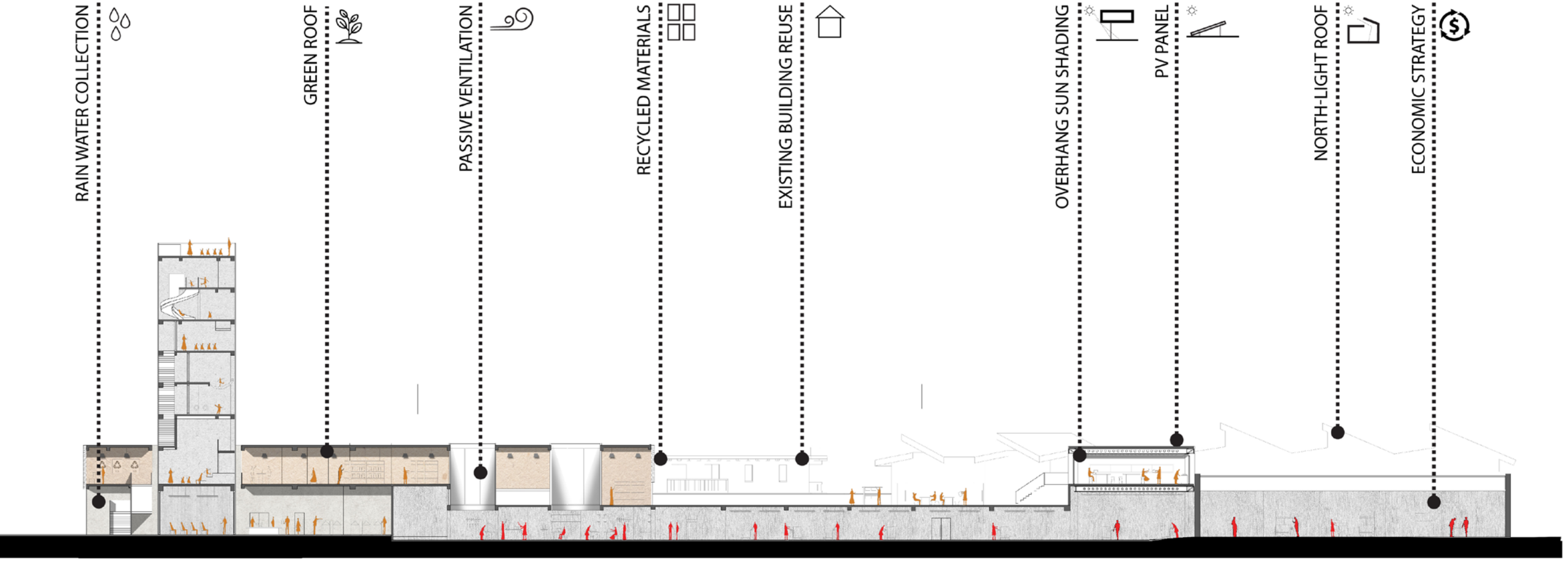
SUN PATH



Variable	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Insolation, kWh/m²/day	4.10	5.08	5.98	7.02	7.16	6.92	7.08	6.88	5.91	5.01	4.19	3.74
Clearness, 0 - 1	0.59	0.63	0.64	0.67	0.65	0.62	0.64	0.65	0.61	0.59	0.58	0.57
Temperature, °C	21.42	22.21	23.31	24.53	25.76	26.57	26.79	26.87	26.63	25.65	24.09	22.22
Wind speed, m/s	6.26	6.26	6.33	5.45	5.27	4.58	4.74	4.46	4.94	5.97	6.88	6.73
Precipitation, mm	68	54	50	63	130	194	149	157	174	164	75	55
Wet days, d	5.9	6.8	5.0	5.1	8.5	12.5	9.5	11.4	12.6	12.9	8.7	6.7

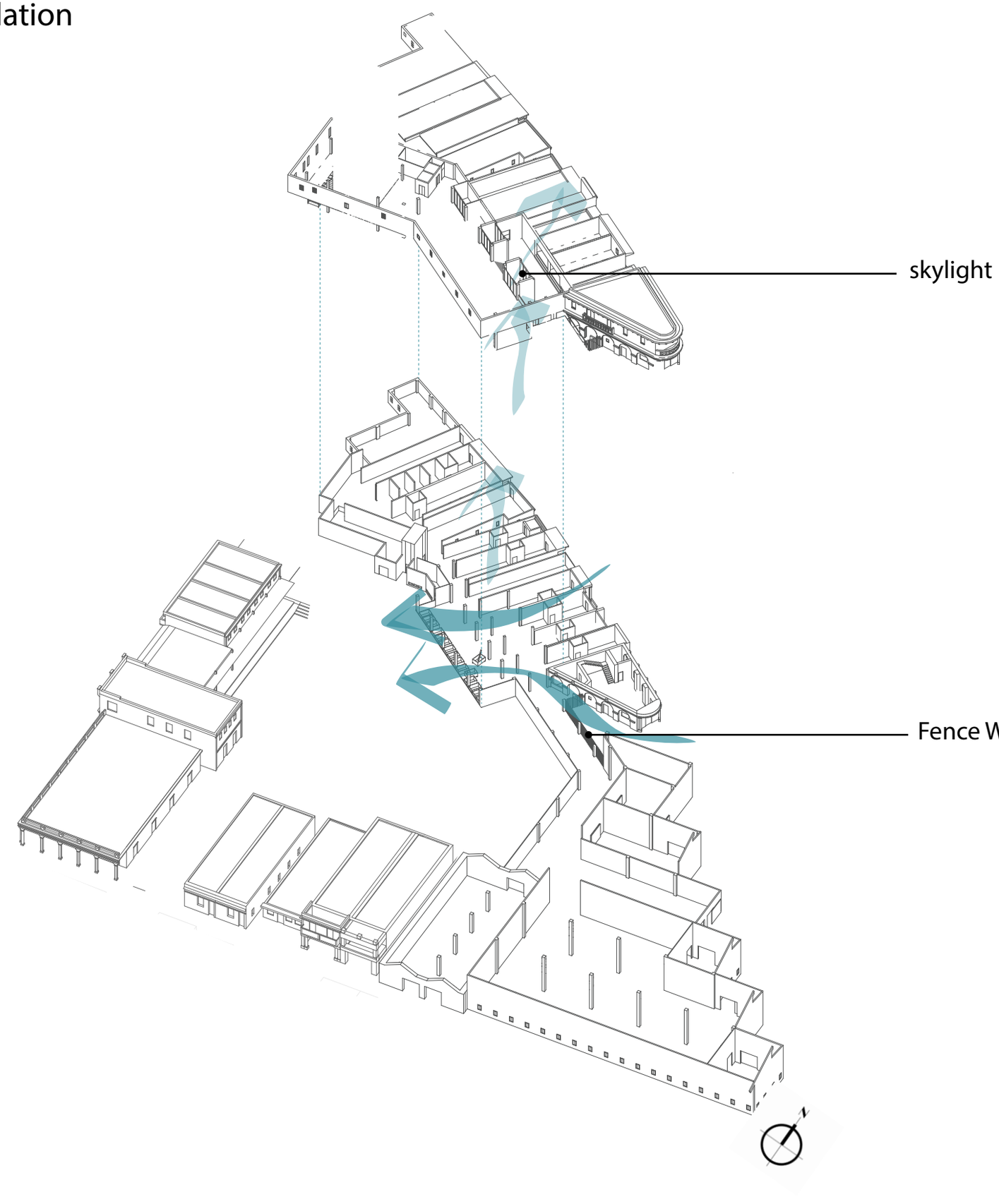
WIND DIRECTION DISTRIBUTION in %





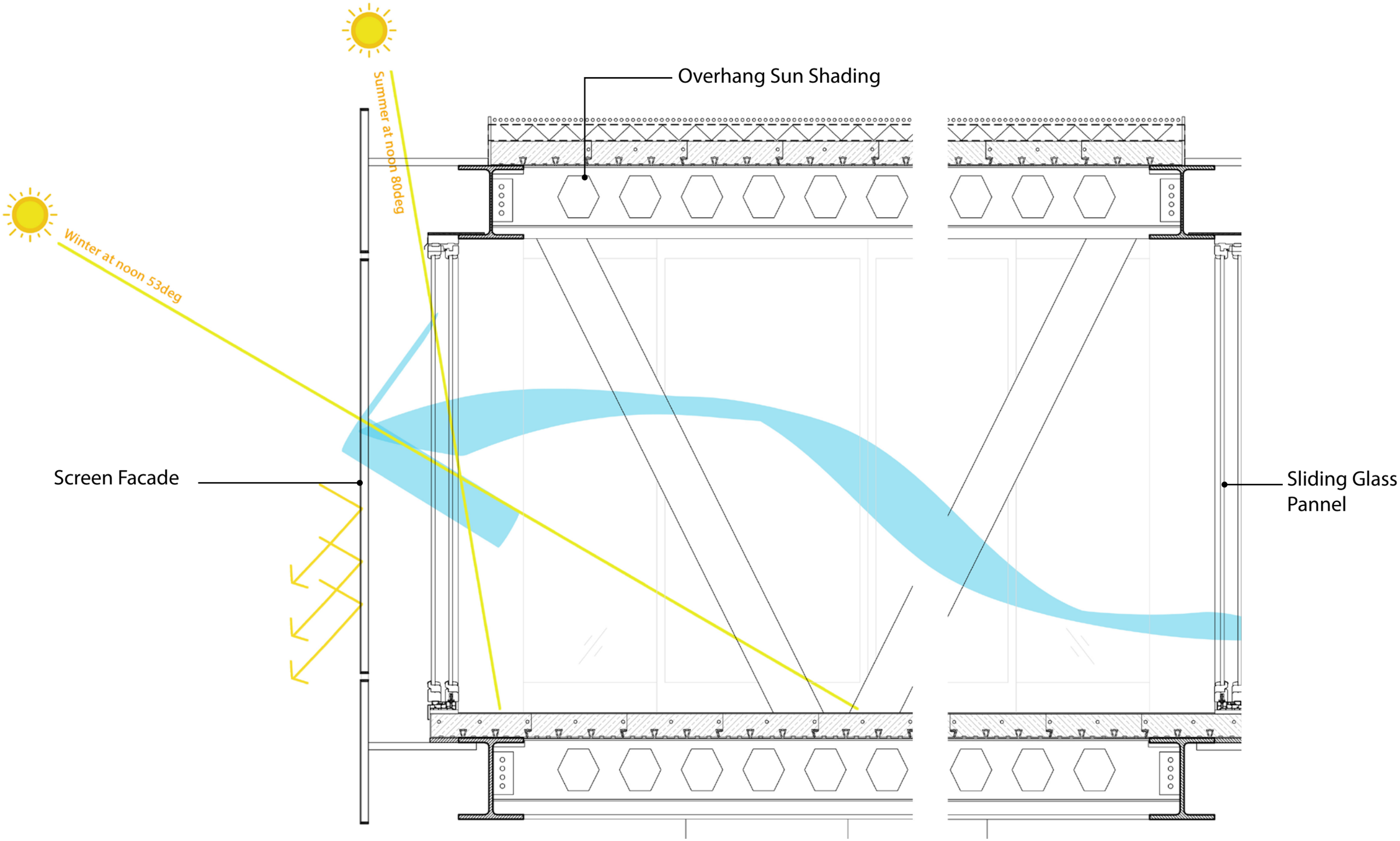
Comfort - Thermal - Natural Ventilation

Apply at: Site



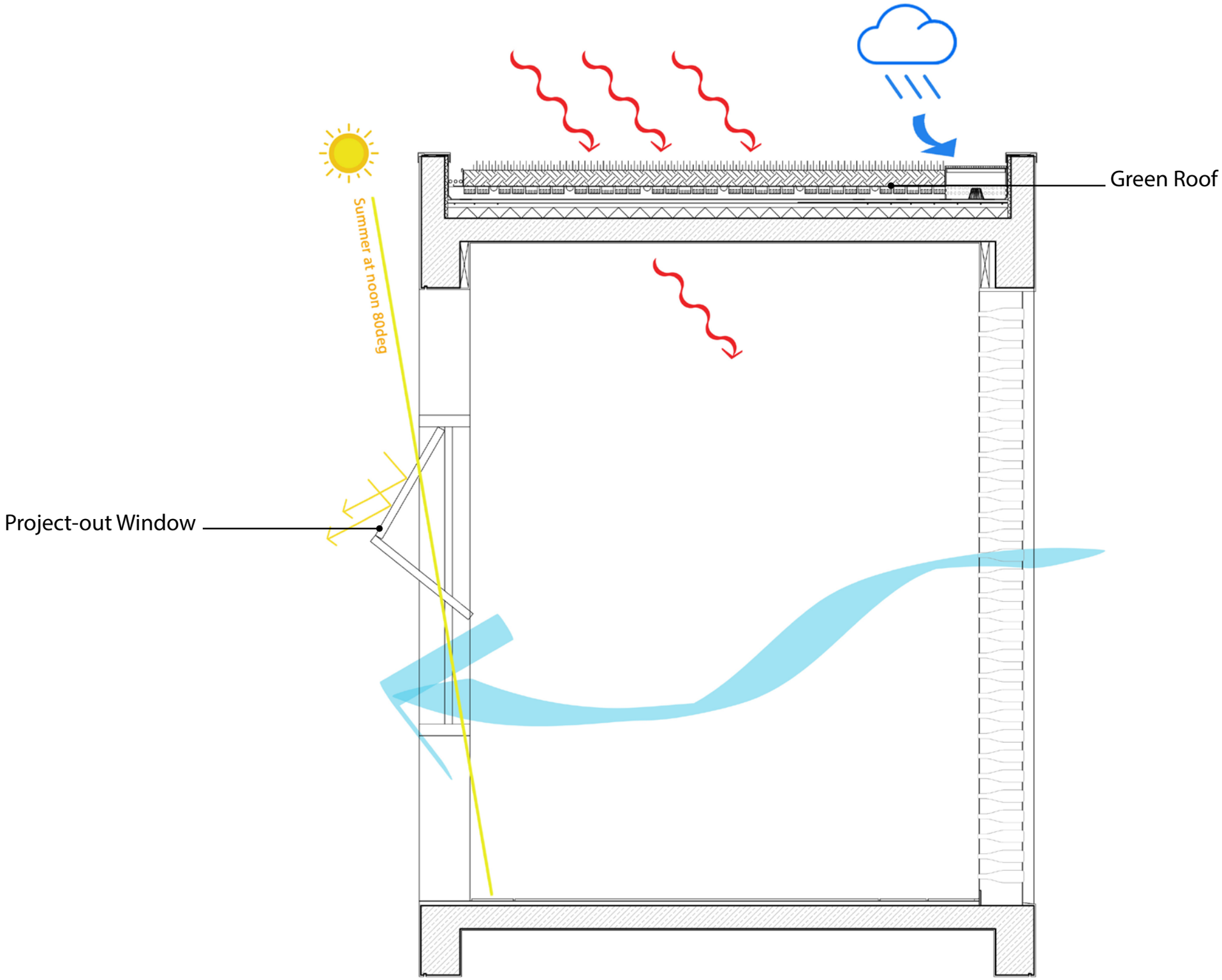
Comfort - Thermal - Cross Ventilation + Overhang Sun Shading

Apply at: Repair Workshop



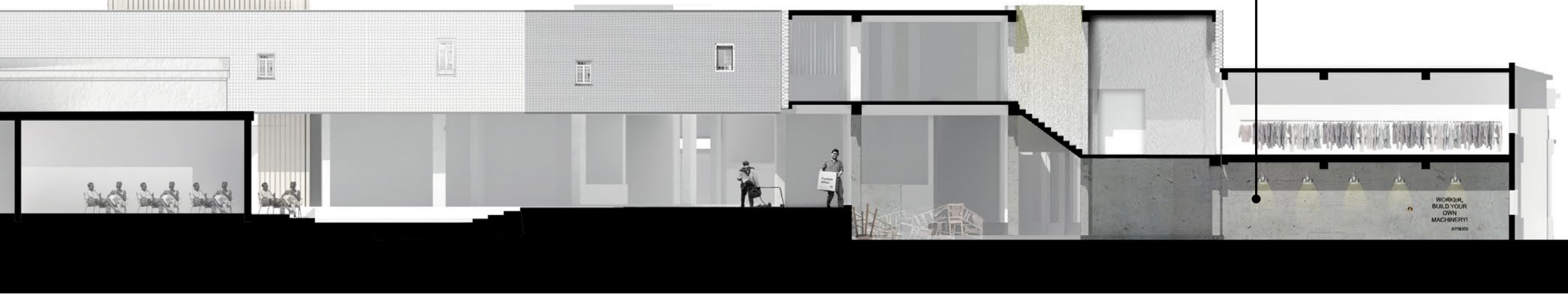
Comfort - Thermal - Green Roof

Apply at: Warehouse

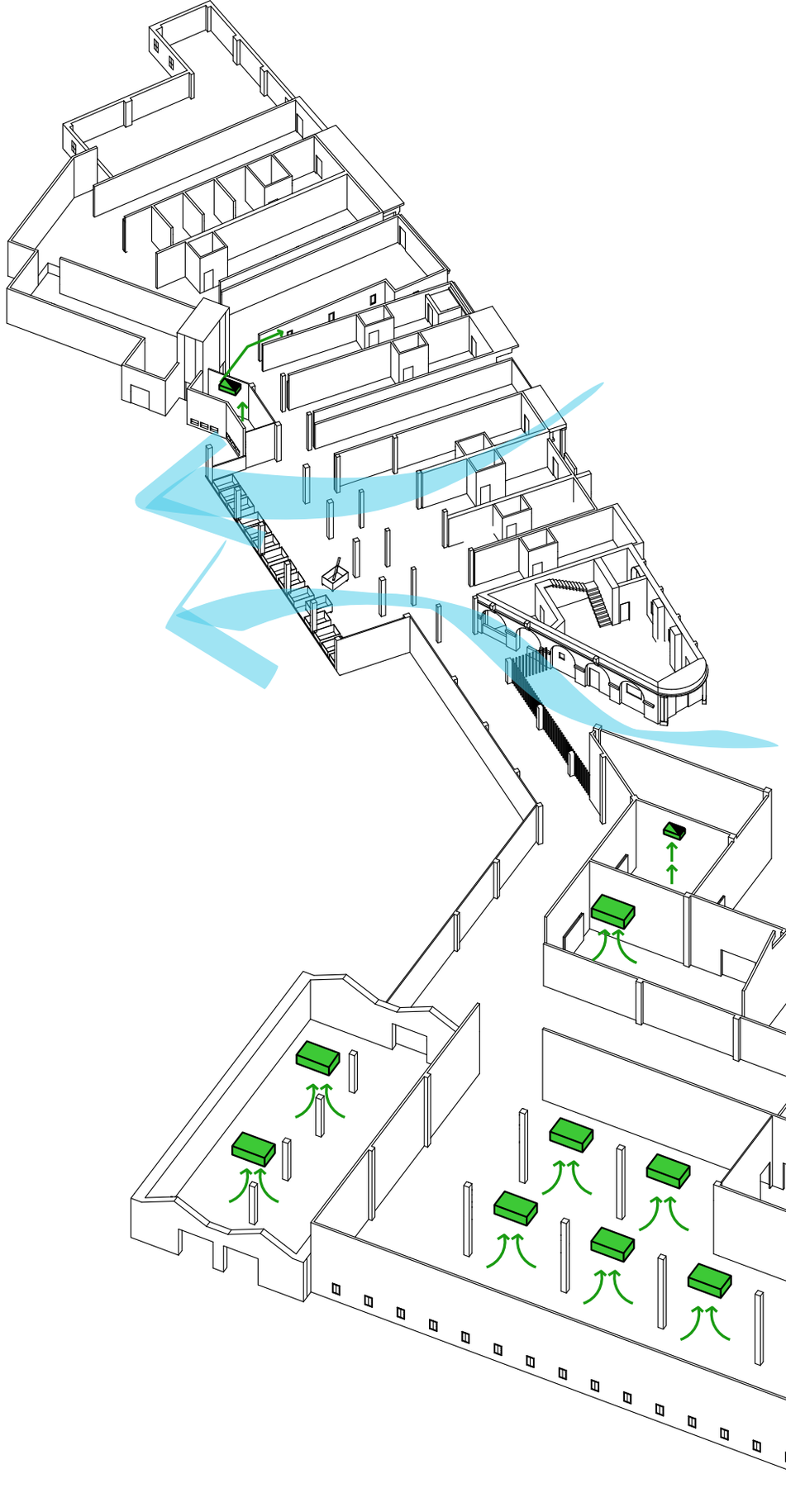


Comfort - Noise

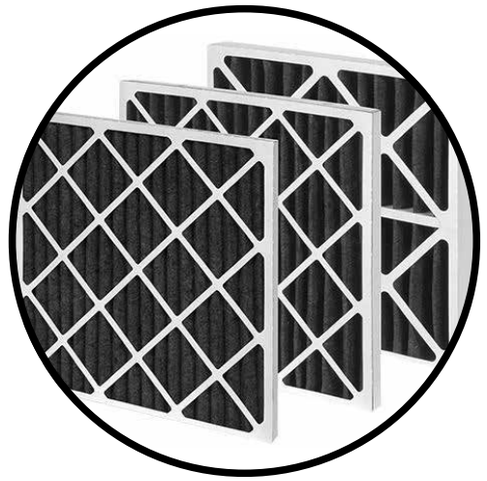
Softwood Fabric Panel



Comfort - Smell



Activated Carbon Filter

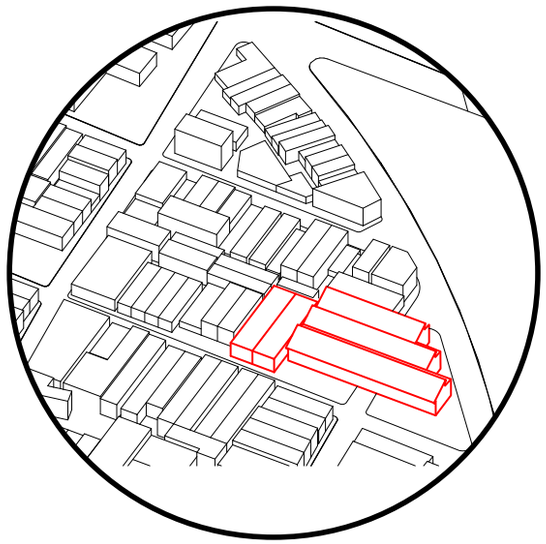


Mechanical Ventilation Activated Carbon Filter

Mechanical Ventilation

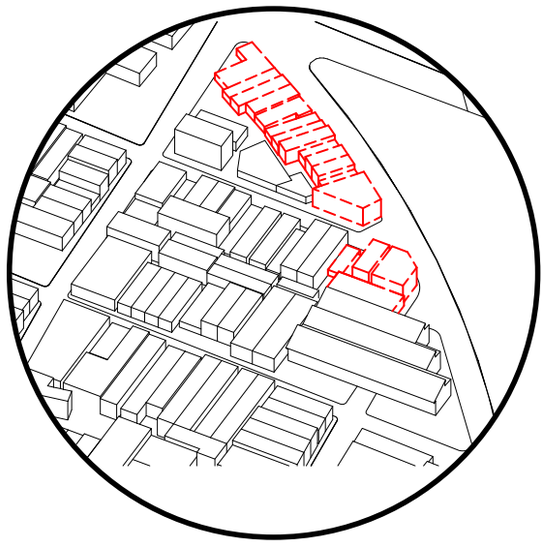
Phasing

Phase 1



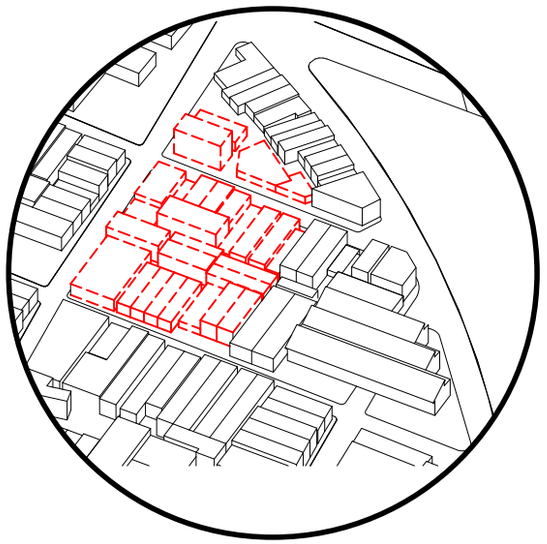
Constructe Facctory

Phase 2



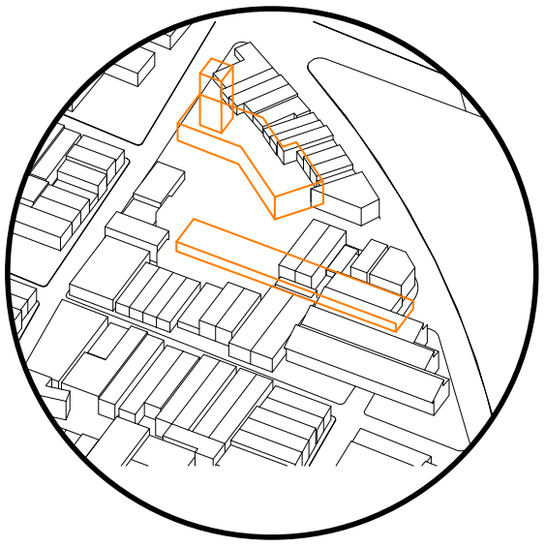
Renovate Disassembly Area

Phase 3



Demolish/ Renovate for Communal

Phase 4



Plug-in New Communal Function