



Constructing independence SINT MAARTEN

Rebuilding a resilient community with a circular neighborhood intervention

Final presentation - Martijn Dalinghaus

“Everyone, rich or poor, deserves a shelter for the soul.”

Samuel Mockbee, Rural Studio

CAUSE



Man walking on the main road of philipsburg after hurricane Irma 7 september 2017

Introduction

Problem statement

Objective

Research

Design

Impact

Introduction

REGIONAL CONTEXT



THE ISLAND



ISLAND SNAPSHOT



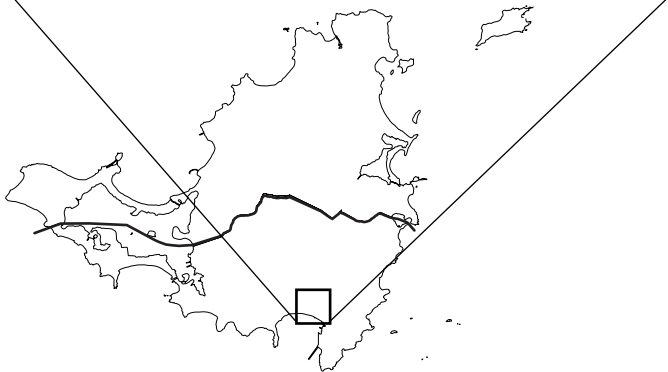
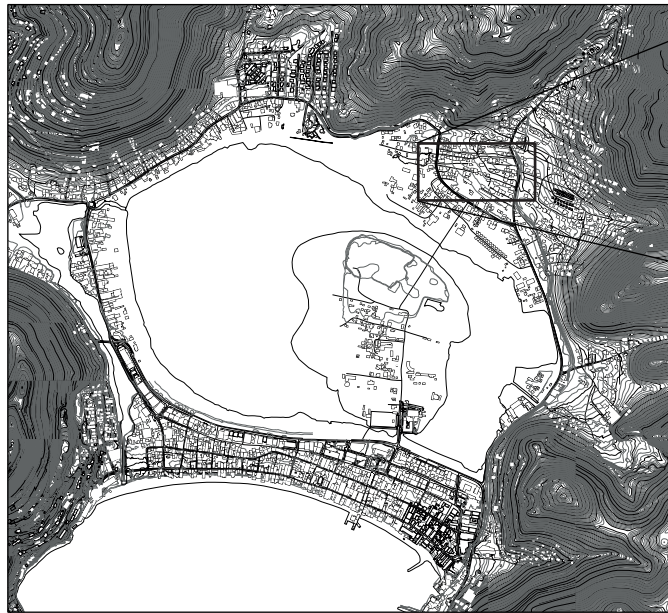
Image: New York Times

Problem statement

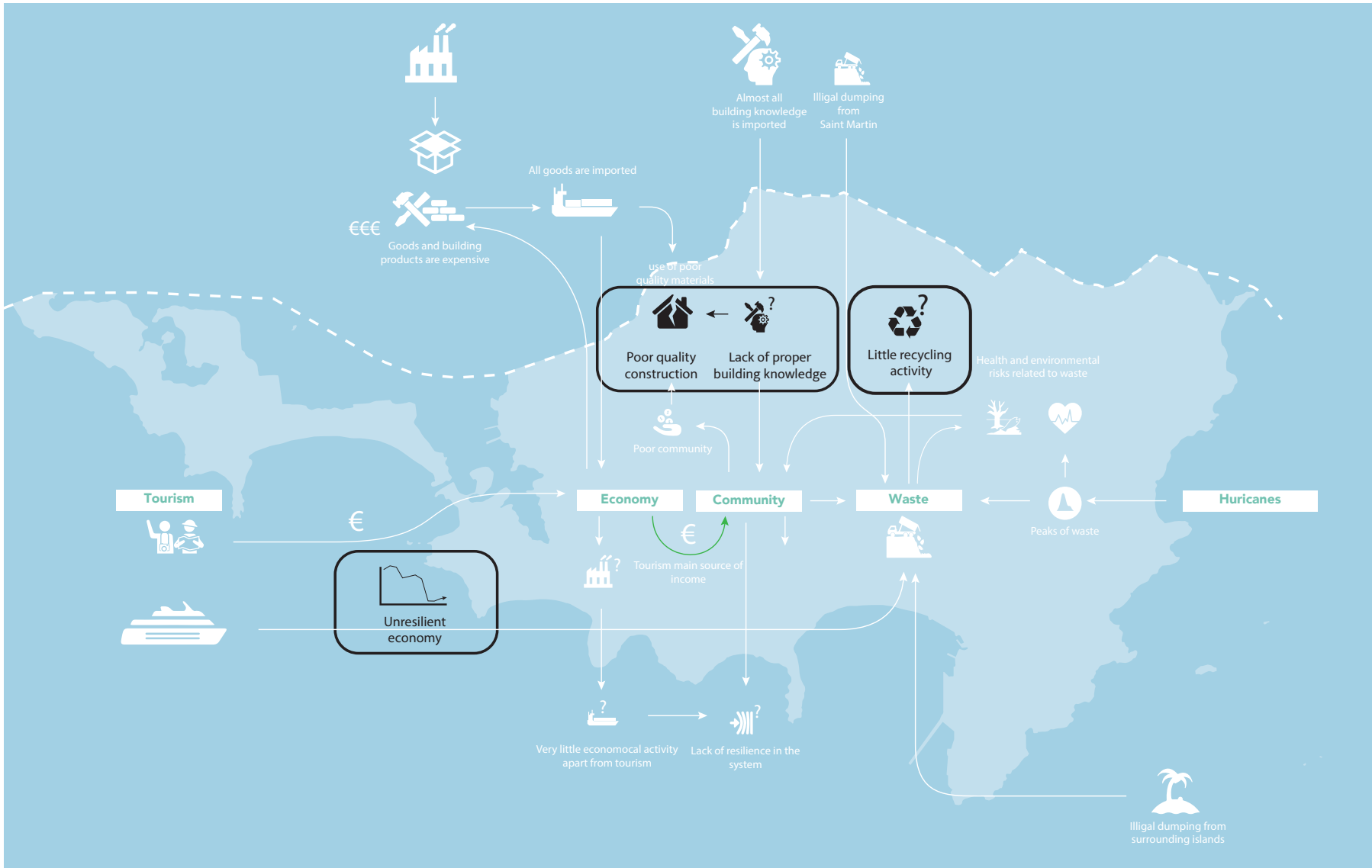
SELF BUILD CULTURE



SITE



MAP OF PAINS: LACK OF SOCIO ECONOMIC RESILIENCE



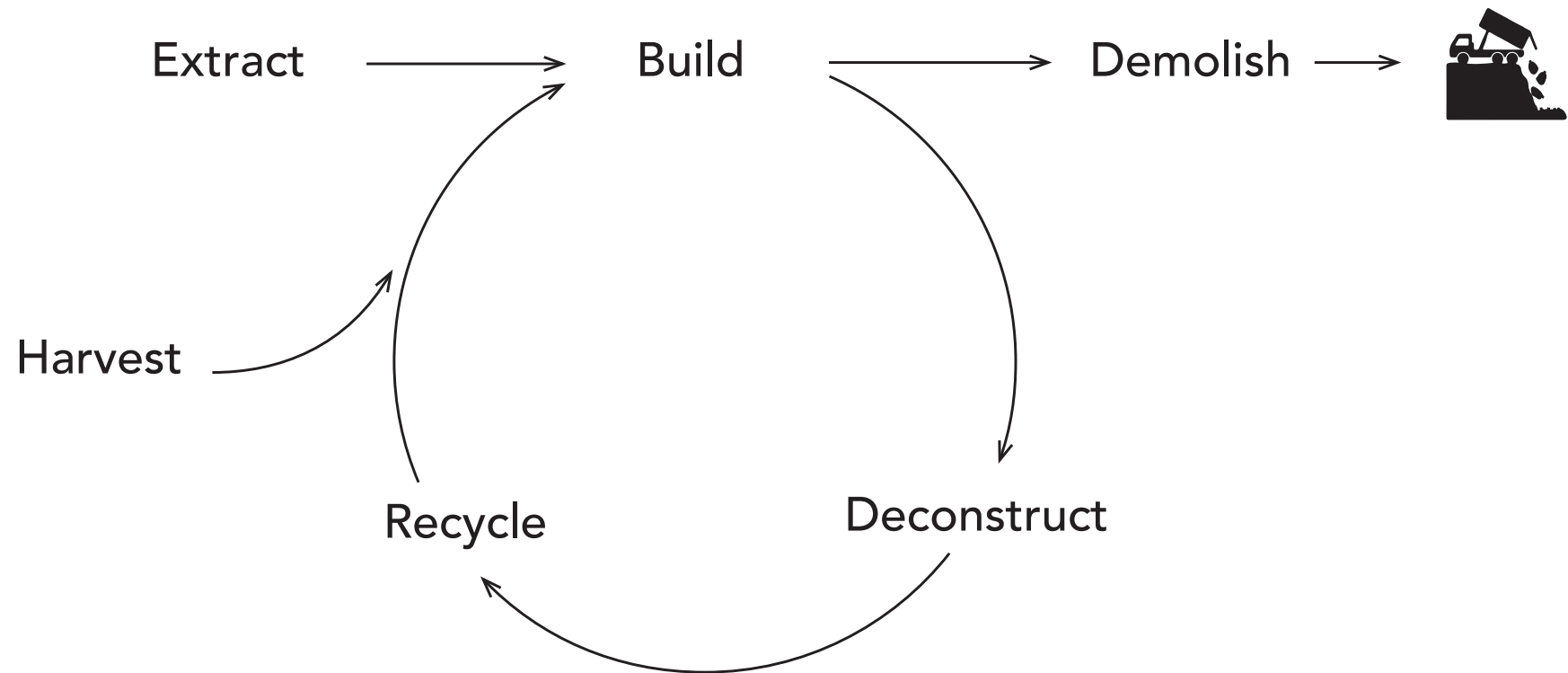
DUMP



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Objective

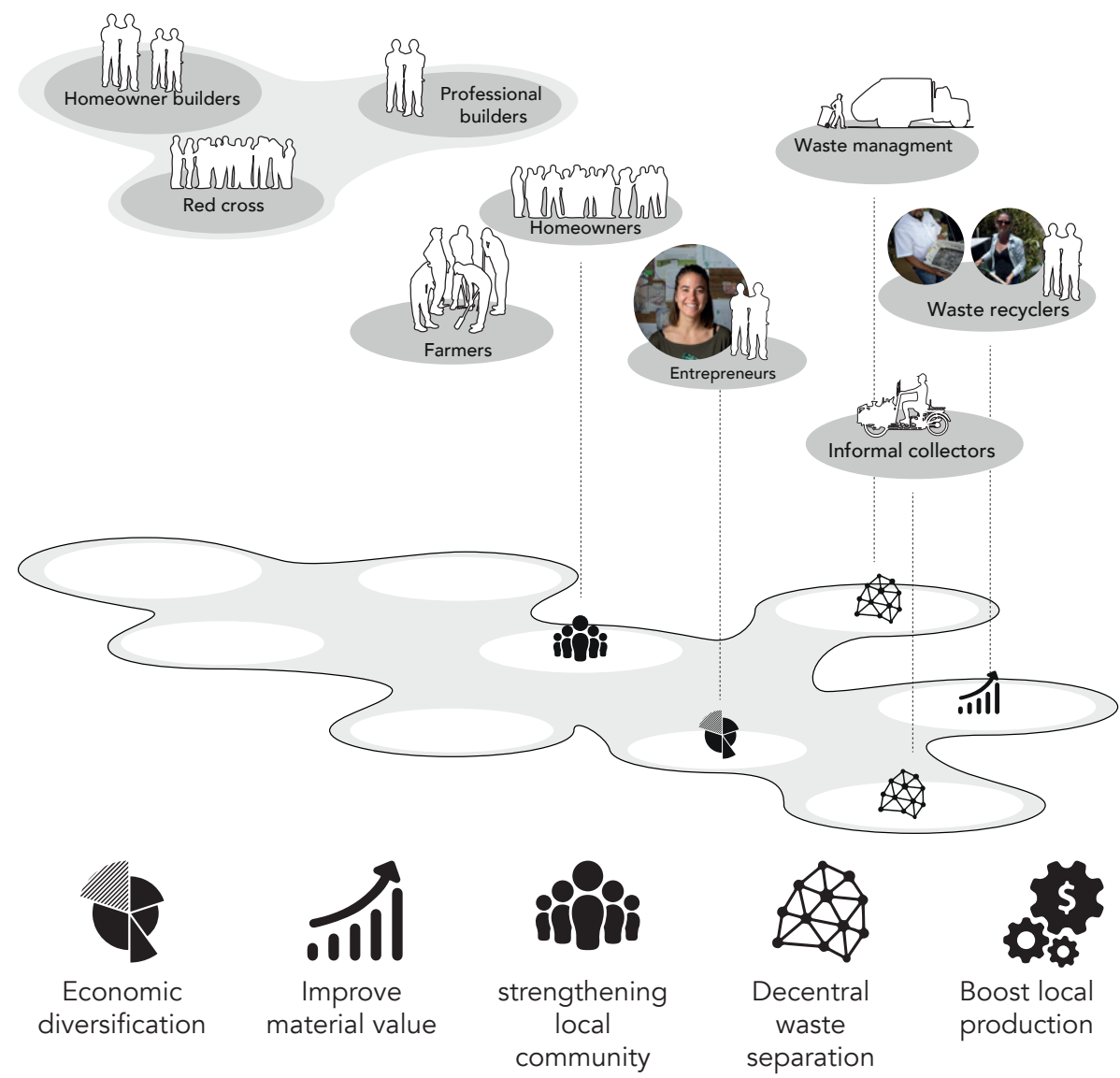
IMPROVE THE URBAN METABOLISM: USING LOCAL MATERIALS



THE PEOPLE OF THE NEIGHBORHOOD



BUILDING A RESILIENT NETWORK



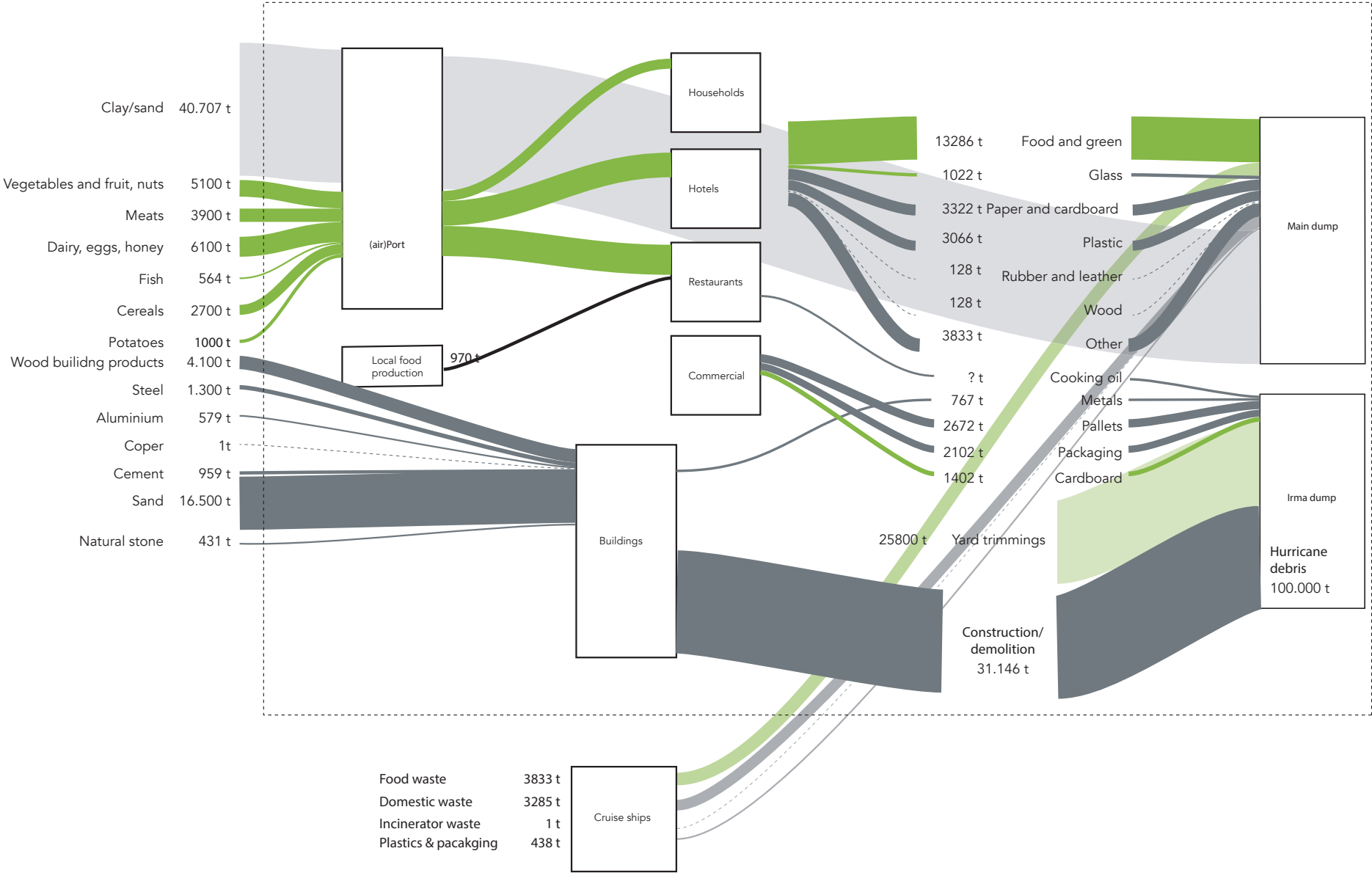
Overall design question

OVERAL DESIGN QUESTION

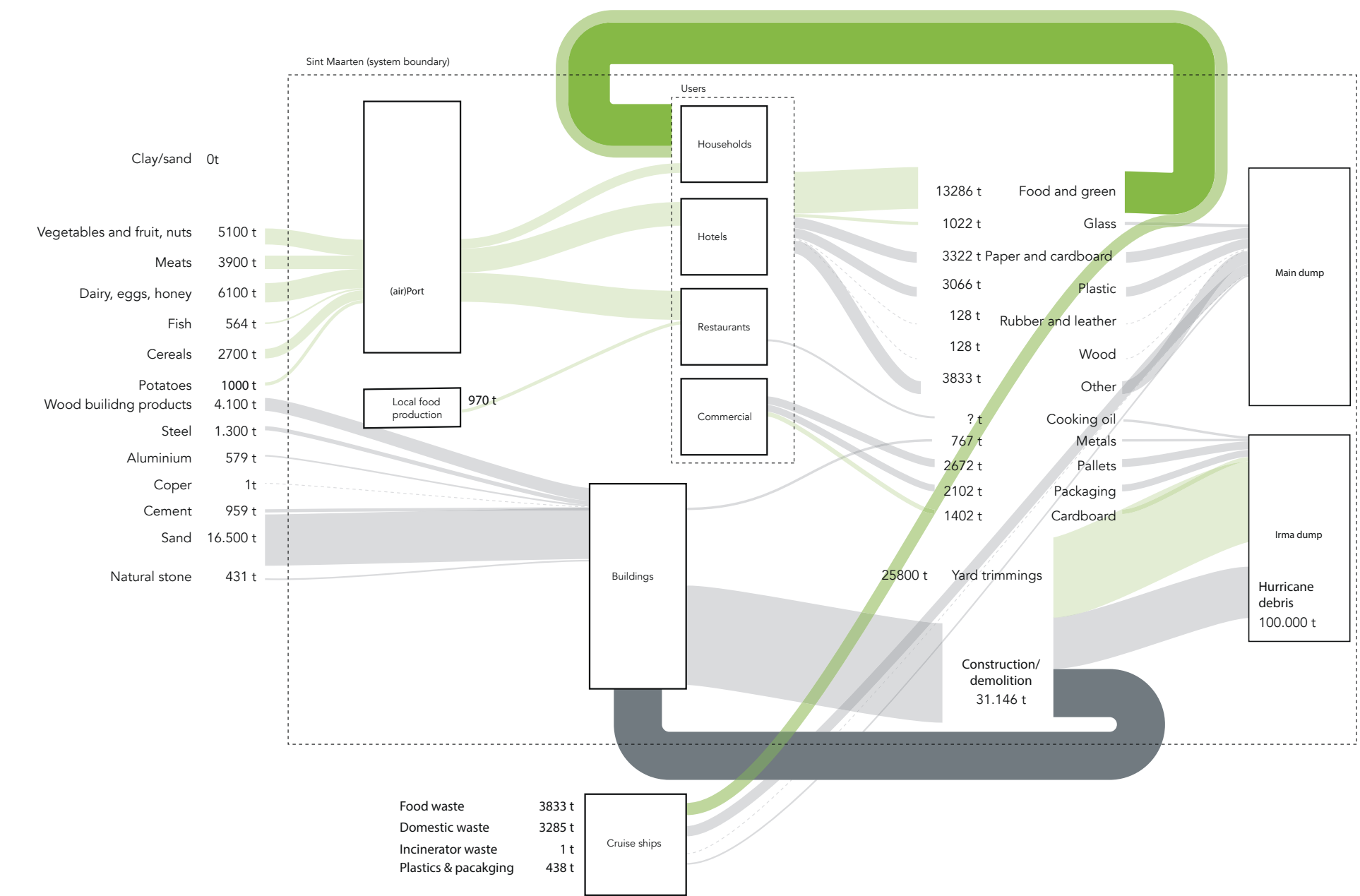
What architectural intervention can improve the urban metabolism of Sint Maarten while enhancing the economic and communal resilience of it's inhabitants?

Research

MFA FOR SINT MAARTEN



MFA: LOOP POTENTIAL MOST PROMISSING STREAMS



HARVEST MAP



WASTE TRADE CALCULATIONS



Shipping costs

20 ft (1TEU)

40 ft (2TEU)

1TUE = $6,1 \times 2,44 \times 2,59 = 38,5 \text{ m}^3$

USA	930,00	1.200,00						
Netherlands	1.800,00	2.340,00						
Puerto rico	100,00	130,00	Paper mill,					
Domunican republic	225,00	295,00						
Cuba	510,00	660,00						

Scrap values (EU)

Glass

Paper

Plastics

Metal scrap

Alu Cans Alu scrap

Average €/t (2004-2015)	46,27	121,13	329,63					
Average \$/t	50,90	133,25	362,60	362,87	1.360,78	3.447,30		

Type of Material

Loose

Av (lbs/cy)

1TUE (ton)

Revenu 1TUE

Baled

Av (lbs/cy)

1TUE (ton)

Revenu 1TUE

Cardboard	50 – 100 lbs/cy	75,00	2	\$ 225,30	600 – 1100 lbs	800	18	\$ 2.403,16
PET (Soda bottles, food packaging etc)	30 – 40 lbs / cy	35,00	1	\$ 9.064,89	200–500 lbs /	350	8	\$ 2.861,09
HDPE (Milk Jugs, Detergent Containers etc)	22 – 25 lbs / cy	23,00	1	\$ 9.064,89	200 – 500 lbs,	350	8	\$ 2.861,09
Aluminum Cans	50 – 75 lbs / cy	60,00	1	\$ 34.019,40	150–500 lbs /	300	7	\$ 9.203,41
Steel Cans	150 – 175 lbs / cy	160,00	4	\$ -	500 – 1,000 lb	750	17	\$ 6.135,60
Paper	500– 600 lbs / cy	550,00	12	\$ 9.064,89	1,000 – 1,200	1100	25	\$ 3.304,35
Newspaper	350 – 500 lbs / cy	400,00	9	\$ 9.064,89	750 – 1,000 lb	900	20	\$ 2.703,56
Glass	500 – 600 lbs / cy	550,00	12	\$ 1.272,53	1,800 – 2,500	2100	47	\$ 2.409,83

Revenues including shipping

Aluminum
\$7400-9100/TUE

Steel cans
\$4300-6000/TUE

Plastics
\$1000-2700/TUE

Cardboard
\$600-2300/TUE

Glass
\$600-2300/TUE

WASTES POTENTIAL AS BUILDING MATERIAL

		Market price (\$/TUE)	Weight (kg/m3)		Fit for shipping	Fit for # stories	UV resistance	Moisture resistance	Ease of construction	Reuse after demolition	Availability
Rubble gabions		0	830	830	○○○	2+	●●●	●●●	●●●	●●●	●●●
Plastic bales		600-2300	240	360	●○○	1	●○○/ ●●●	●●●	●●●	●●●	●○○
Paper bales		1000-2700	600	700	●●○	1	●●○	●○○	●●●	●●●	●●○
Alu bales		7400-9100	150	300	●●●	1+	●●●	●●○	●●●	●●●	●○○
Metal bales		4300-6000	400	600	●●●	1+	●●●	●●○	●●●	●●●	●●●

●○○ Poor

●●○ Reasonable

●●● Good

WASTES POTENTIAL AS BUILDING MATERIAL

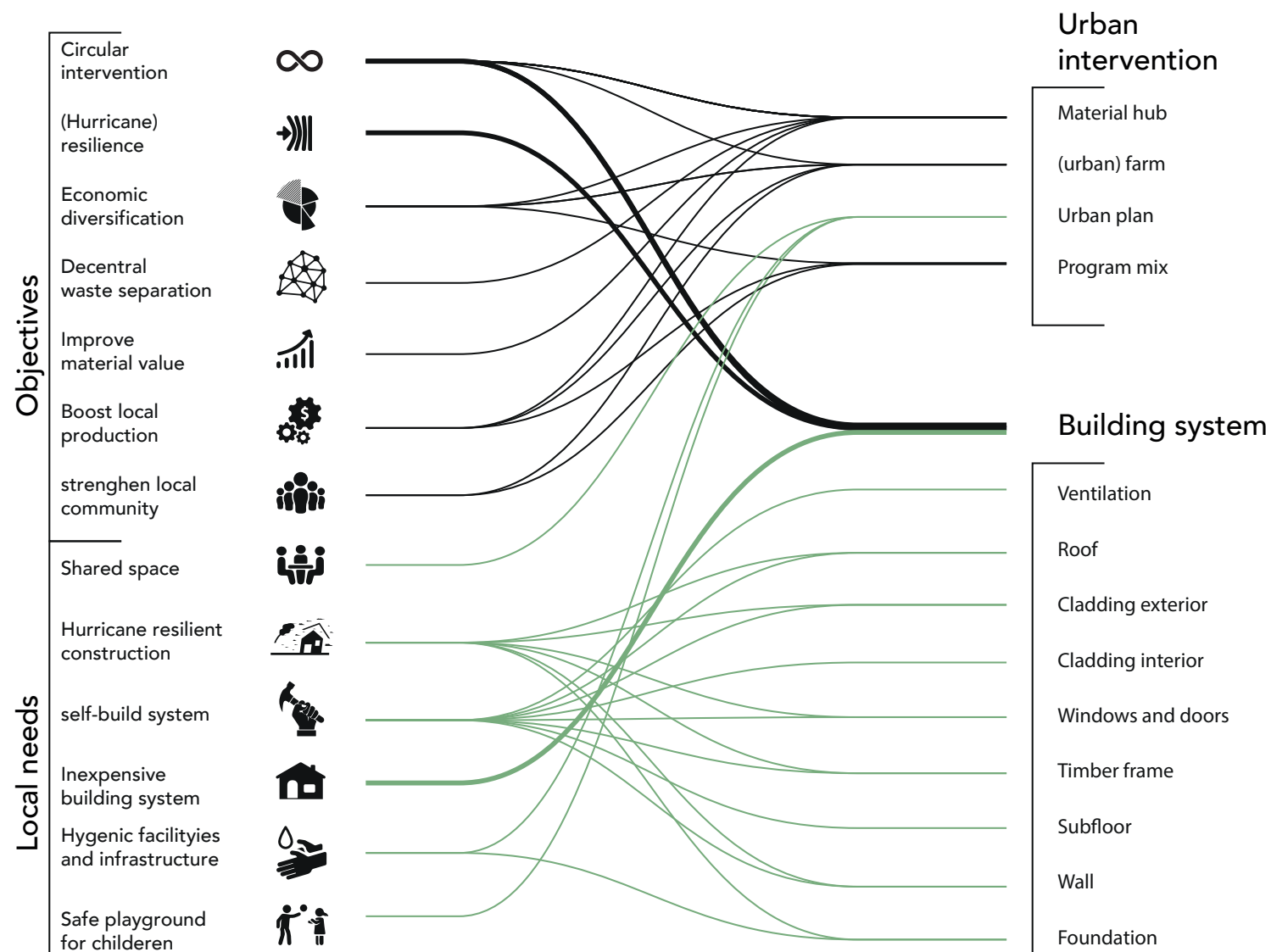
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●○○ Poor

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●●● Good

INPUT FOR DESIGN



Design

INCREMENTAL DEVELOPMENT



2020

INCREMENTAL DEVELOPMENT



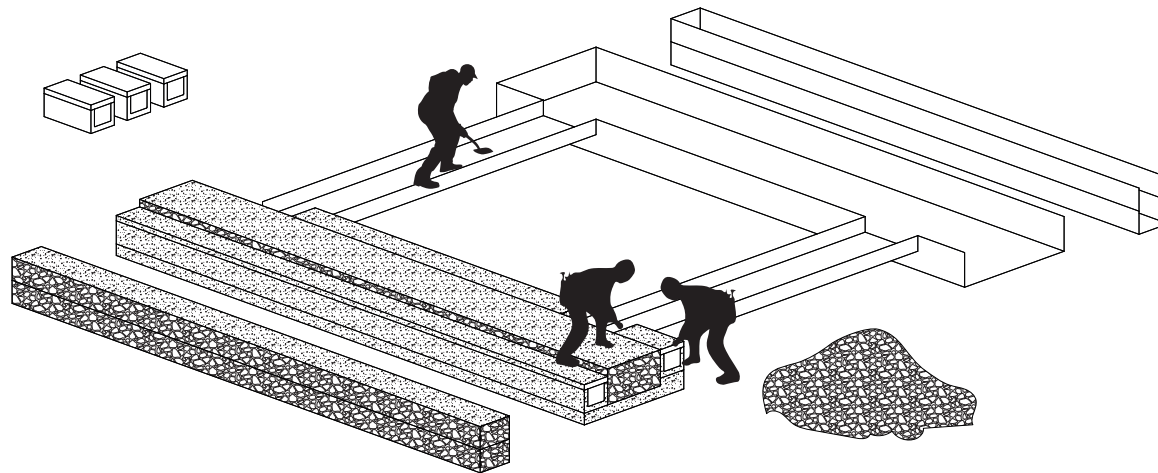
2022

INCREMENTAL DEVELOPMENT

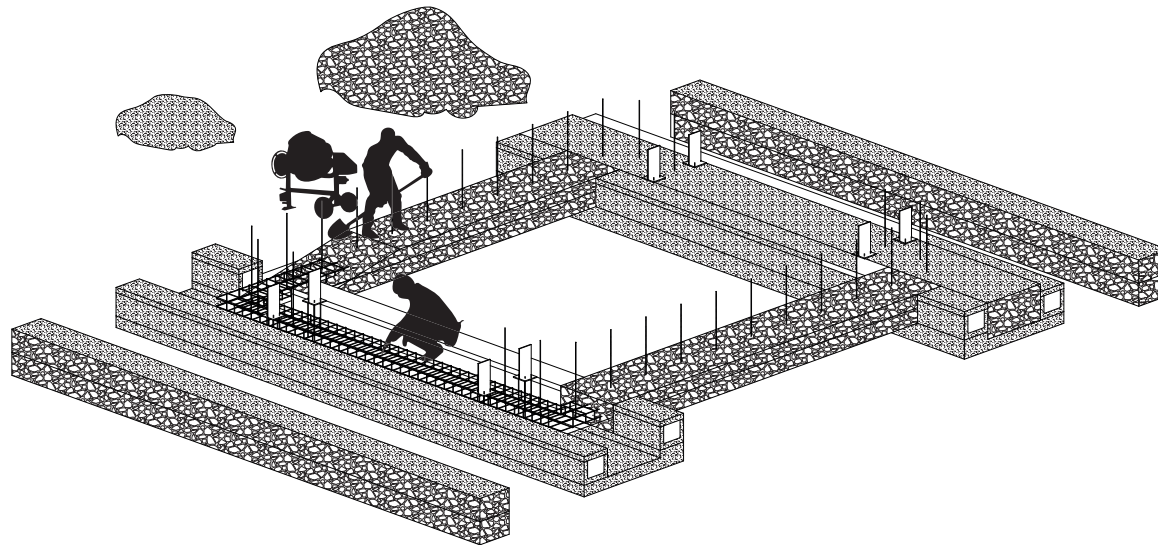


2025

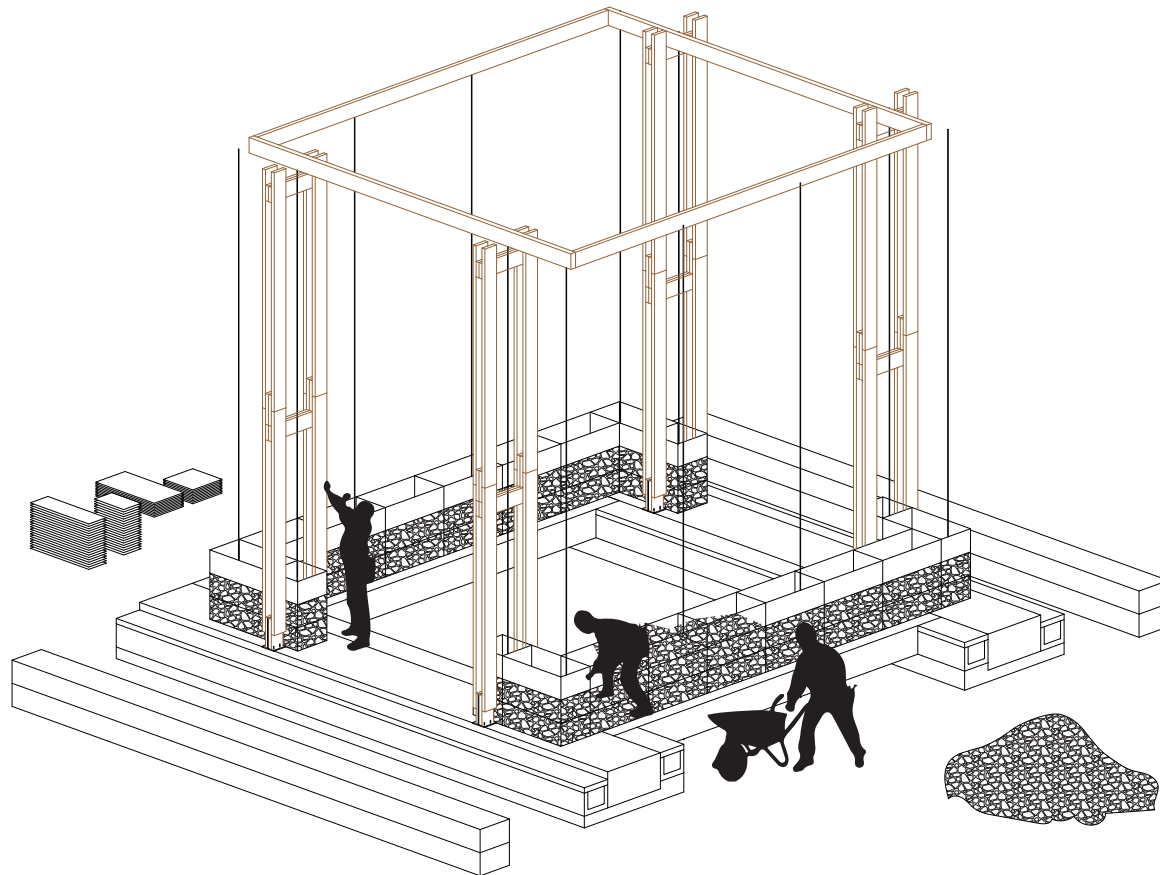
BUILDING SEQUENCE



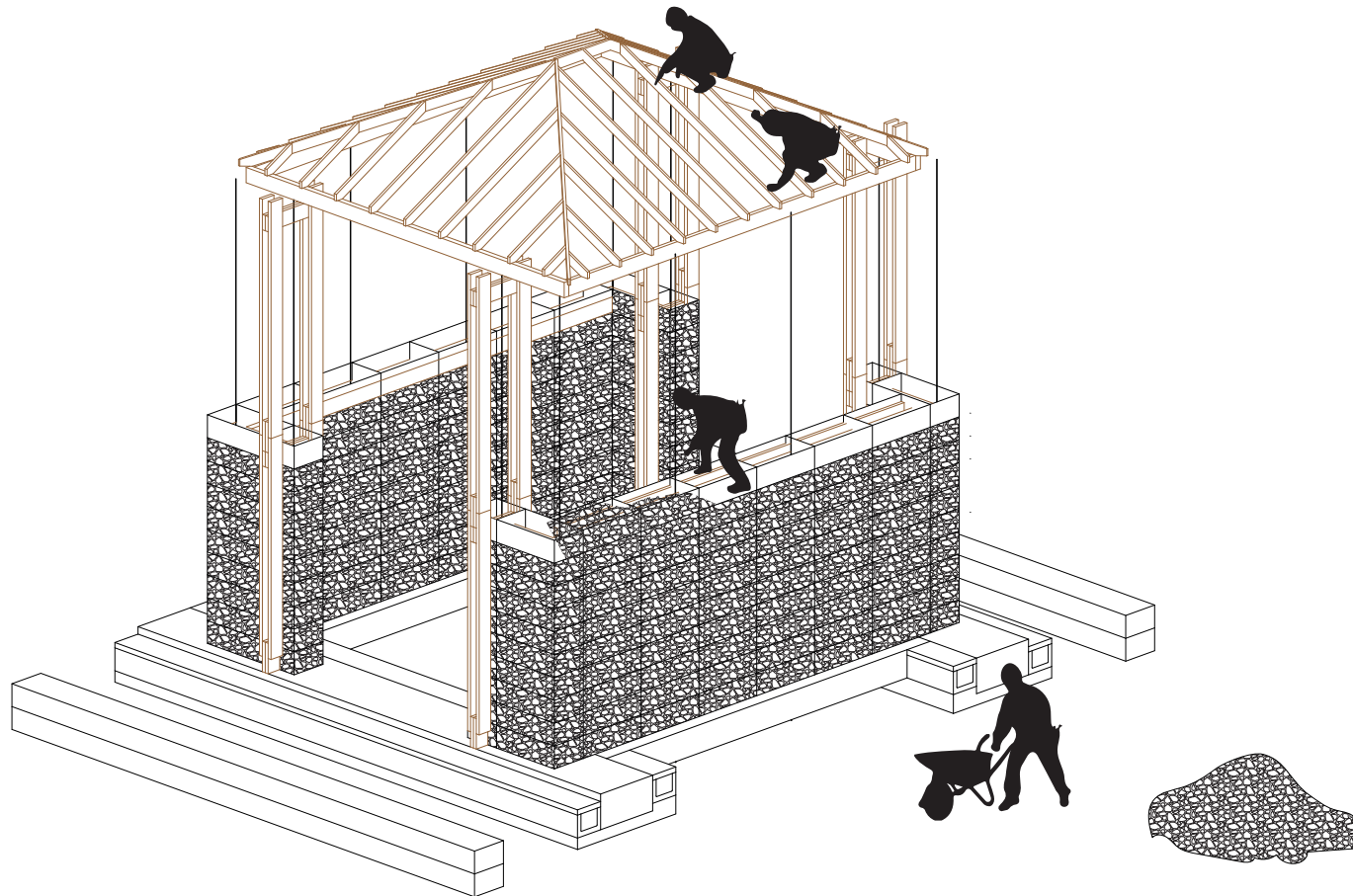
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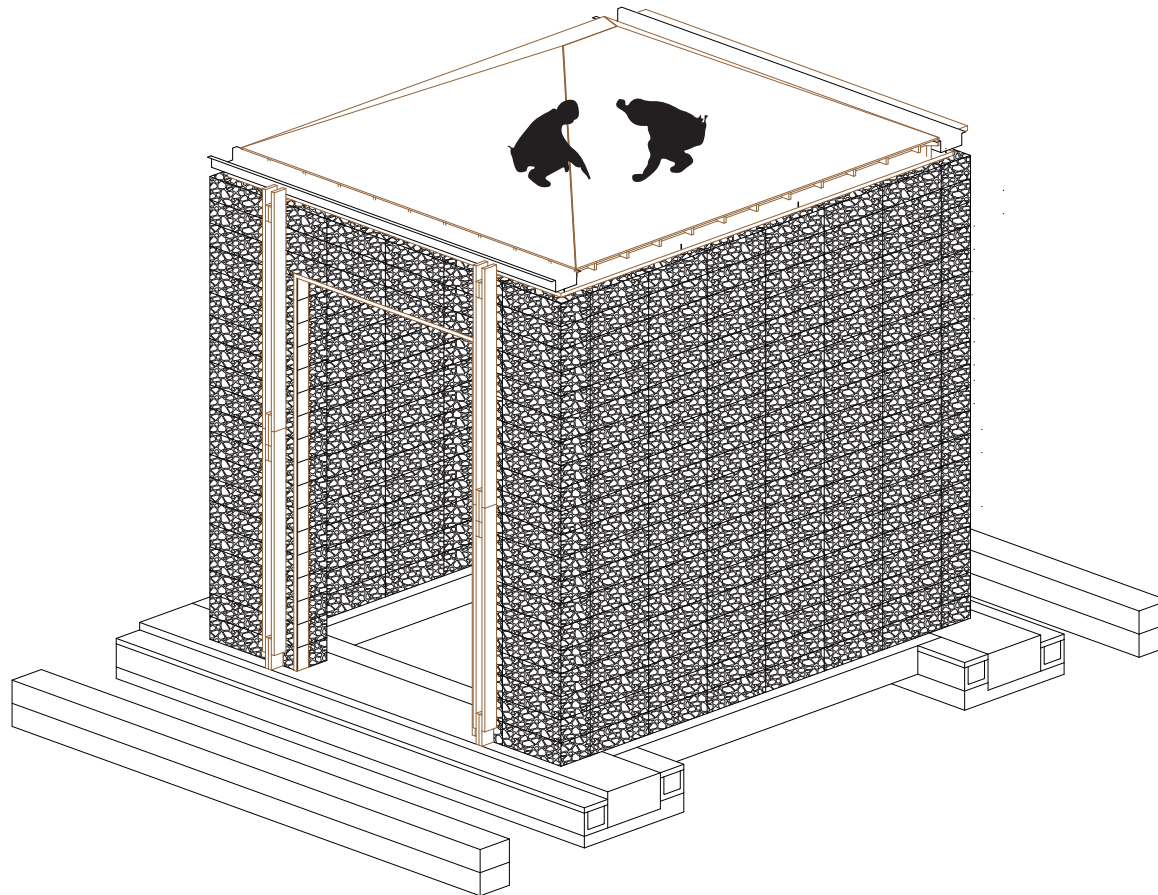
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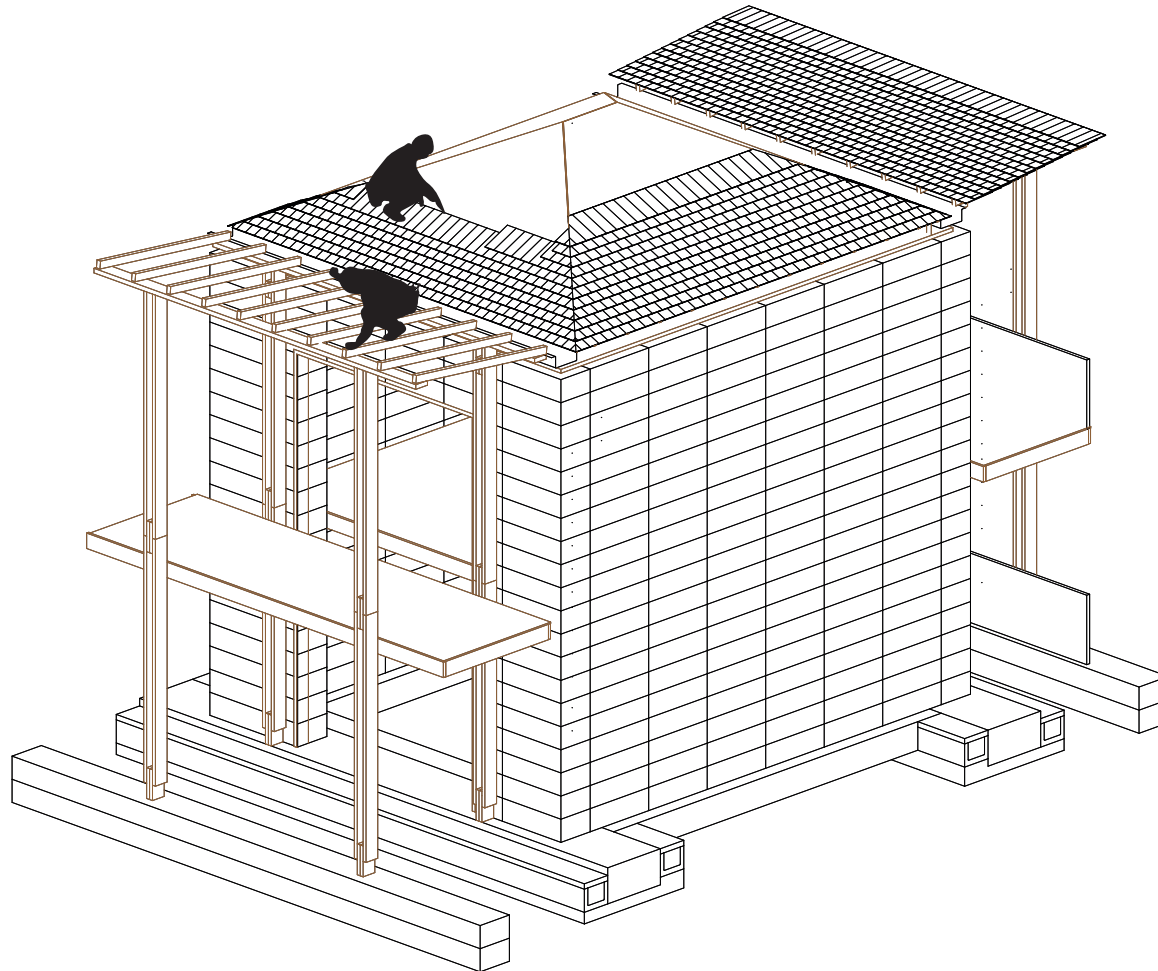
BUILDING SEQUENCE



BUILDING SEQUENCE

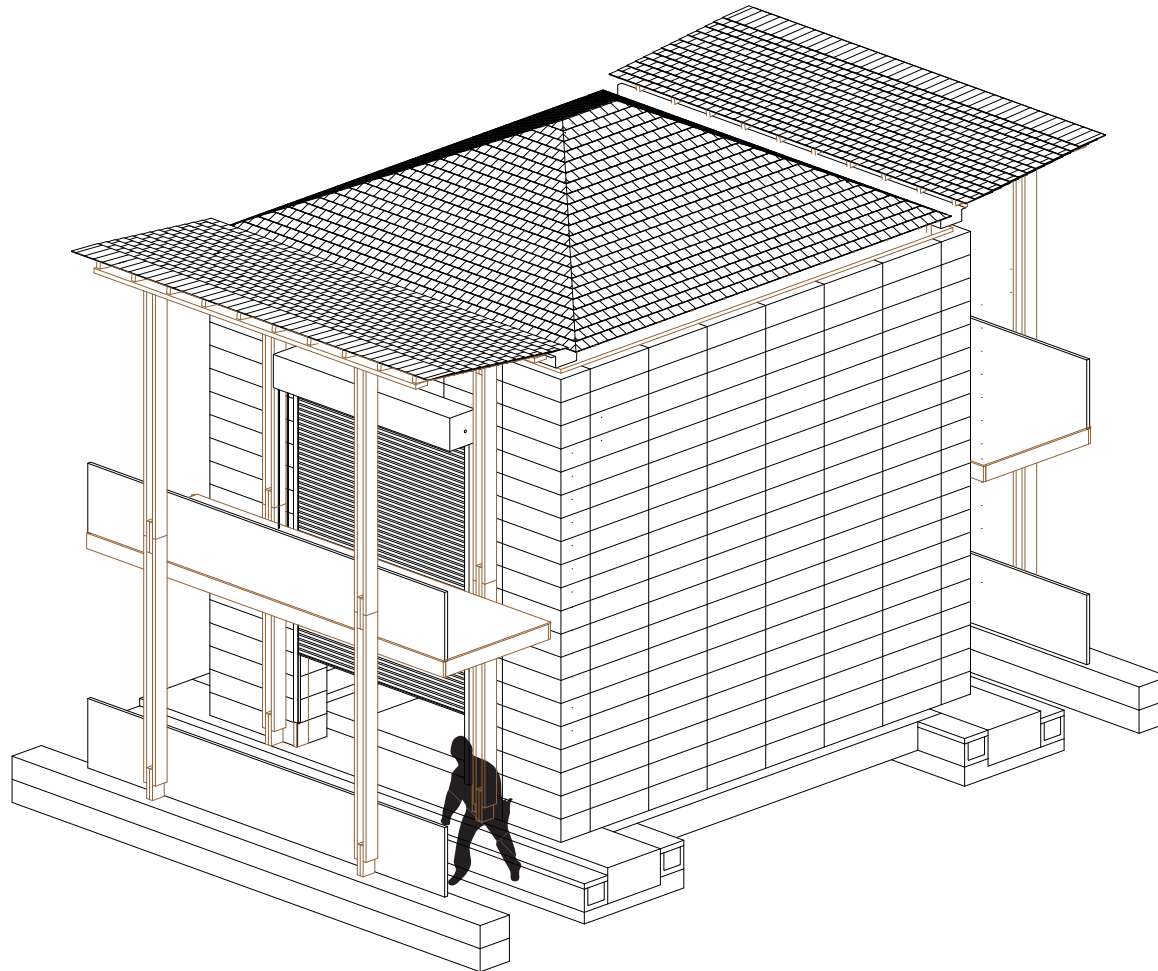


BUILDING SEQUENCE



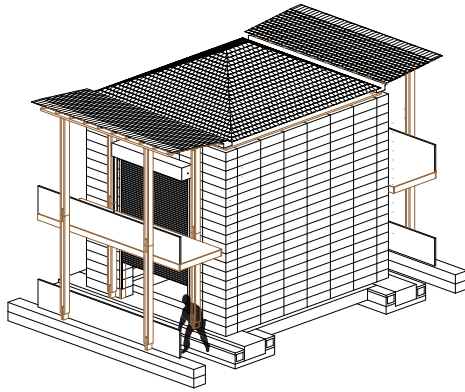
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BUILDING SEQUENCE

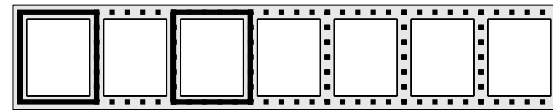


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INCREMENTALITY OF THE BUILDING SYSTEM



Incremental growth of the building blocks



Materialisation

MATERIALISATION



gabion boxes and harvested wood

MATERIALS: RECYCLED PLASTIC SHINGLES

1.



2.


PETE


HDPE


PVC


LDPE

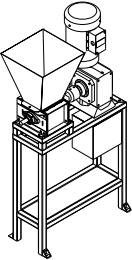

PP


PS

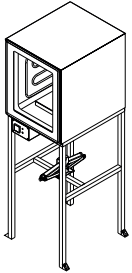

OTHER



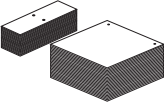
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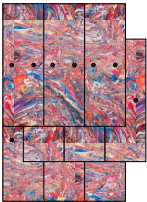
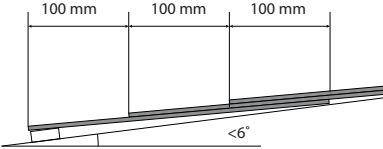


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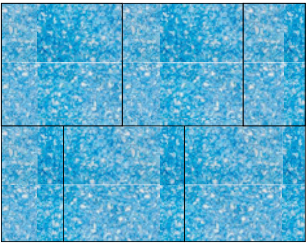
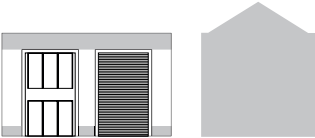


5.





100 mm 100 mm 100 mm
<6°

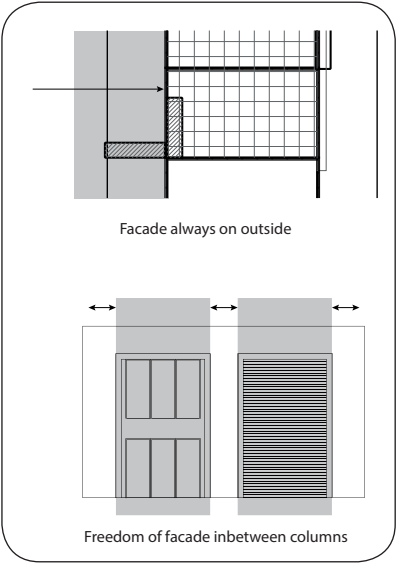


Use exterior cladding to protect against vermin, mechanical damag of gabions and on the unprotected wall parts

FACADE

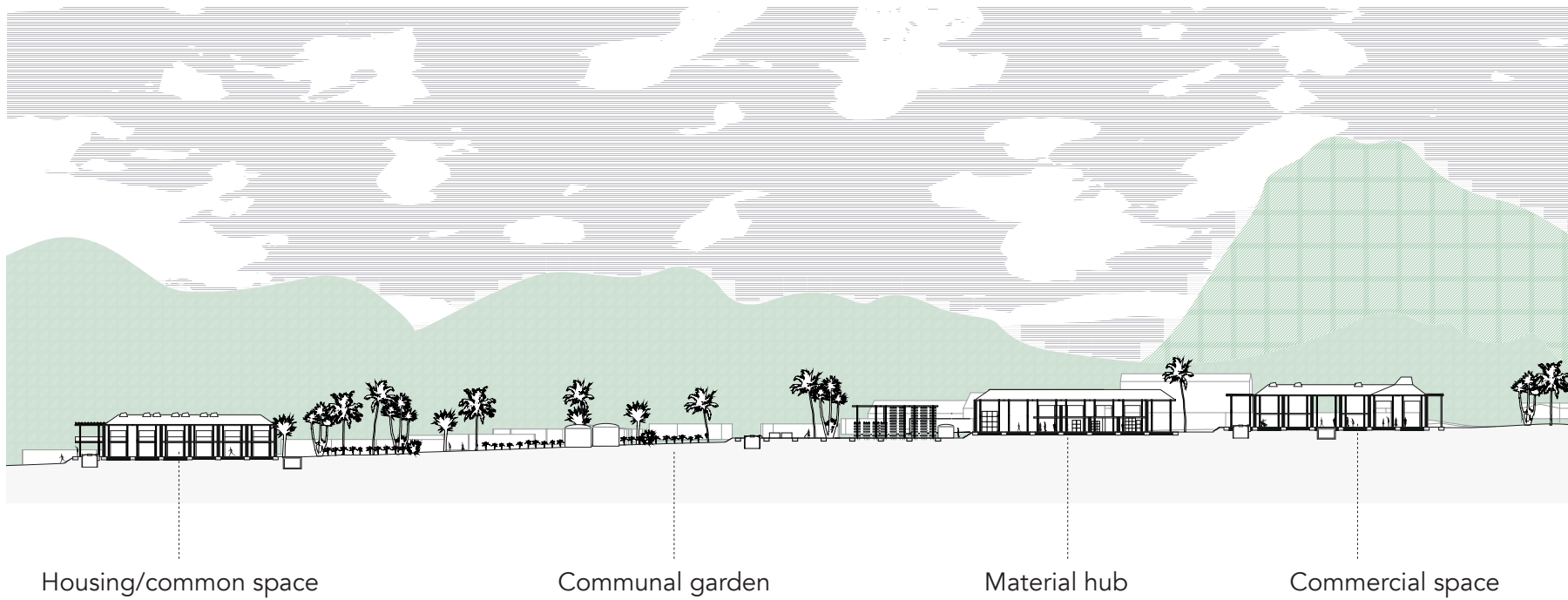


Materiality

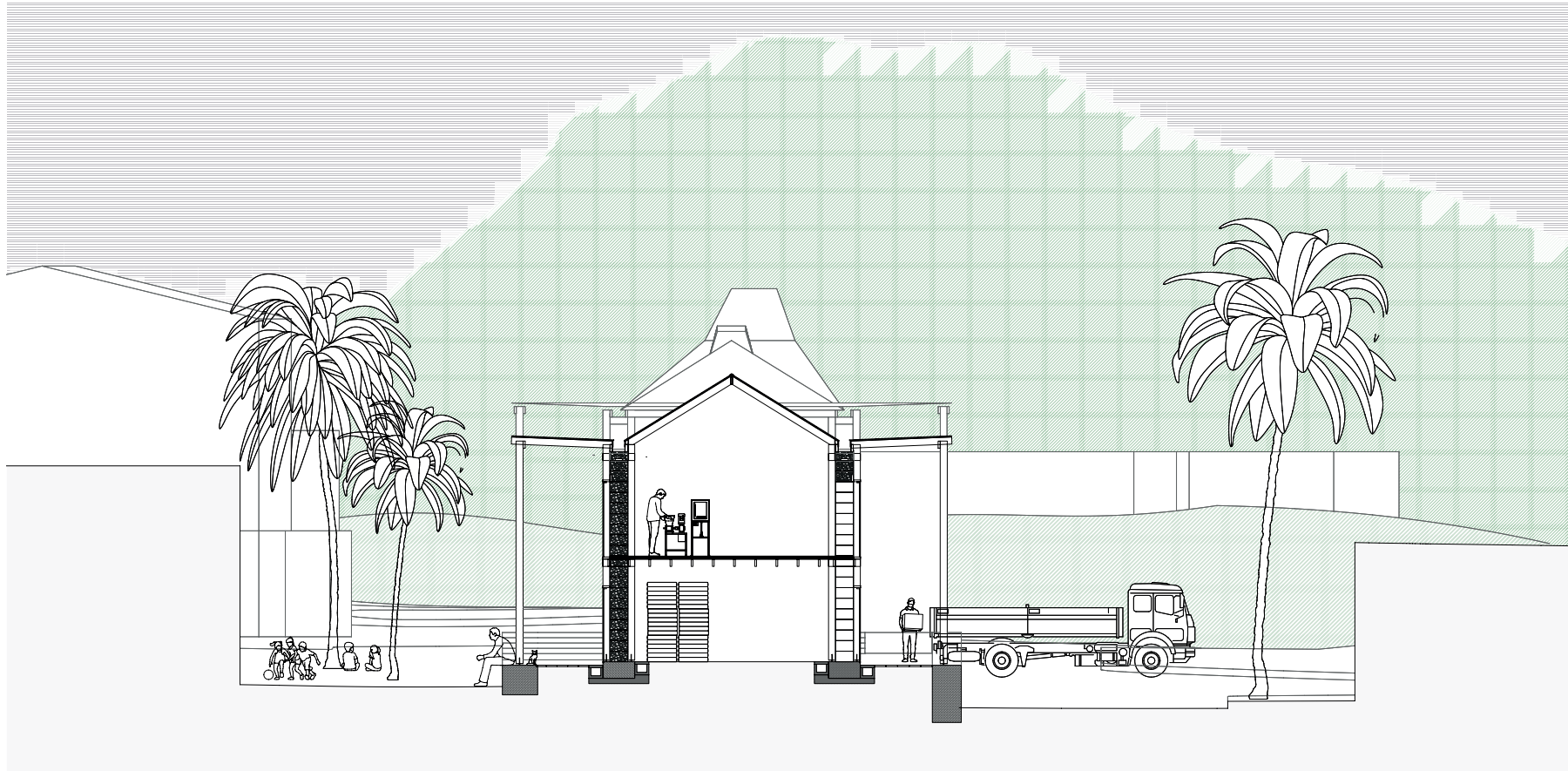


Architectural and urban performance

SECTION: OVERVIEW DESIGN



SHORT SECTION: URBAN PERFORMANCE

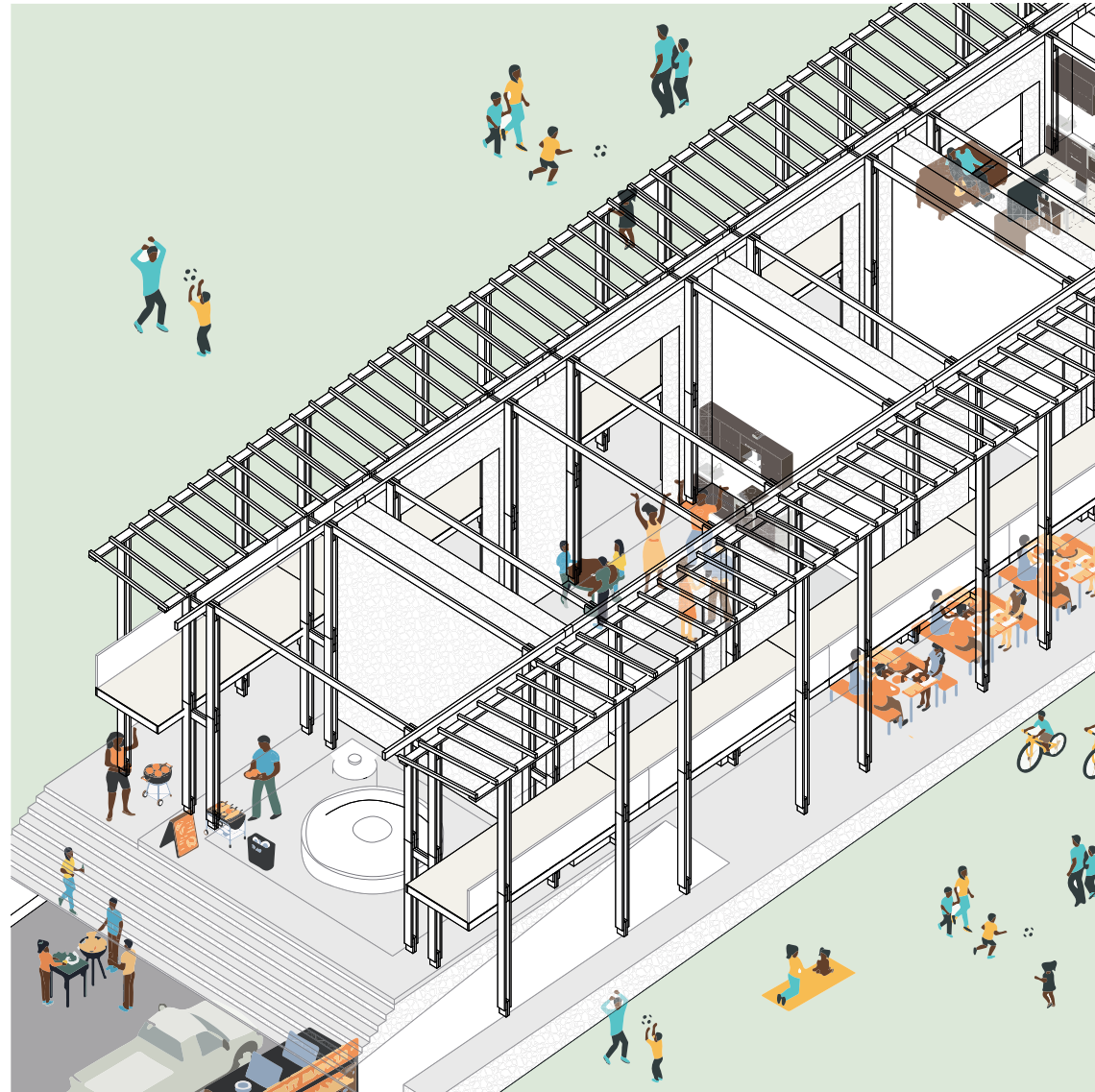


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USE OF COMMUNAL GARDEN

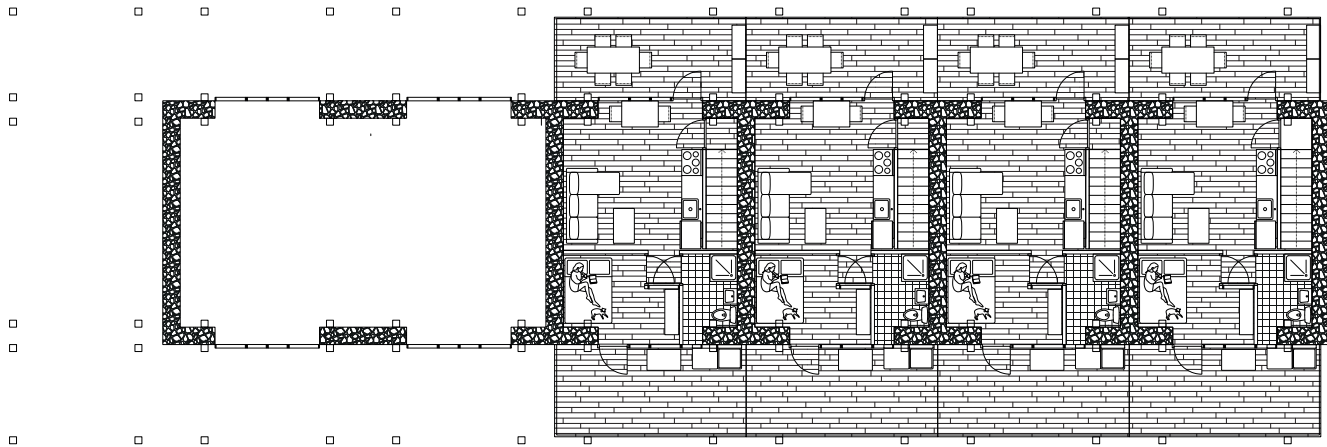


USE OF COMMON SPACE AND HOUSES

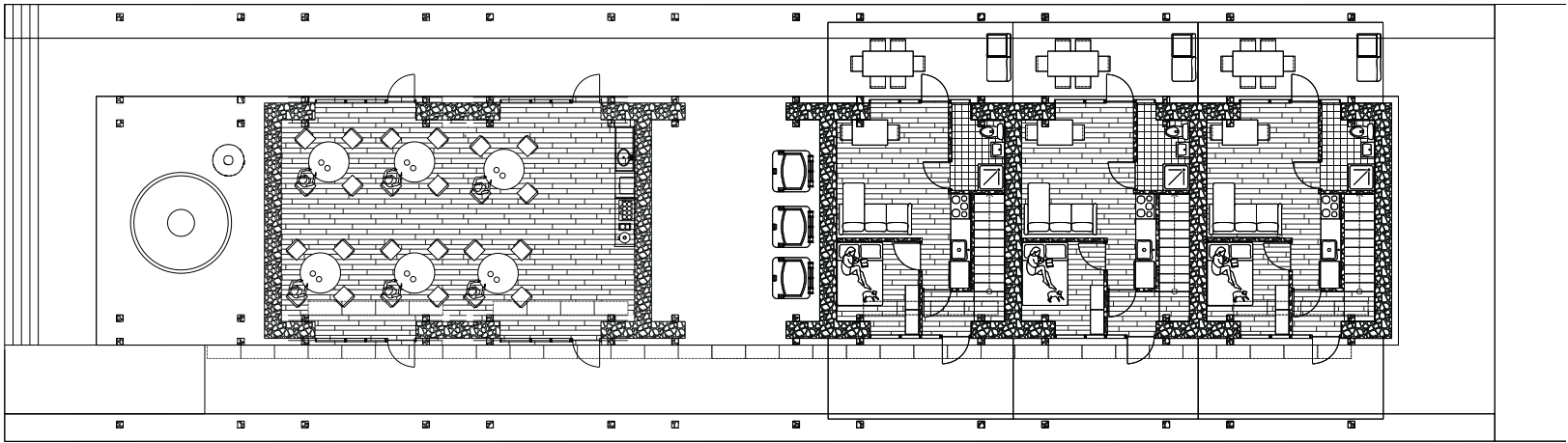


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FLOORPLAN COMMON SPACE AND HOUSES



First floor



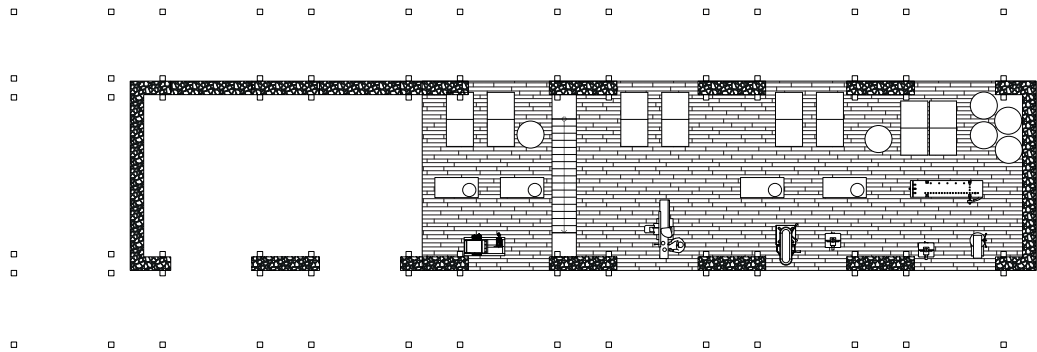
Groundfloor

PERFORMANCE OF HOUSING UNITS WITH COMMON SPACE

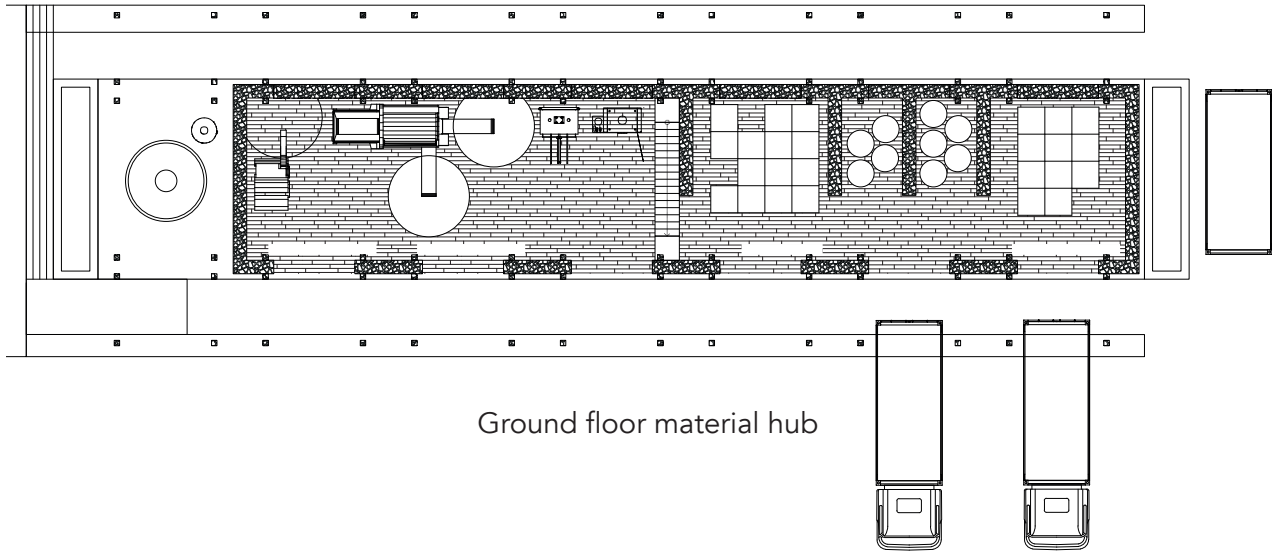


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FLOORPLANS OF MATERIAL HUB



First floor material hub



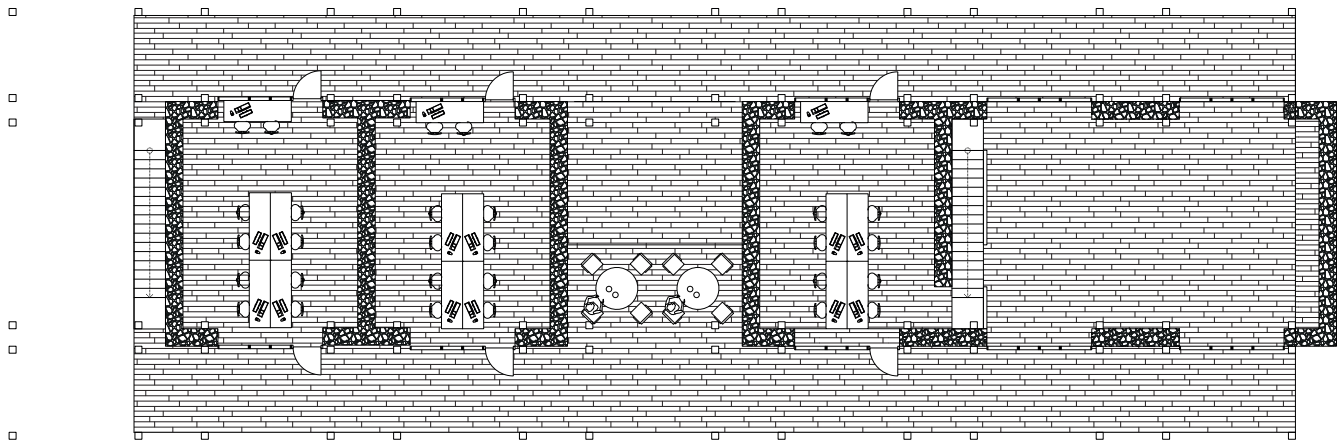
Ground floor material hub

PERFORMANCE OF MATERIAL HUB

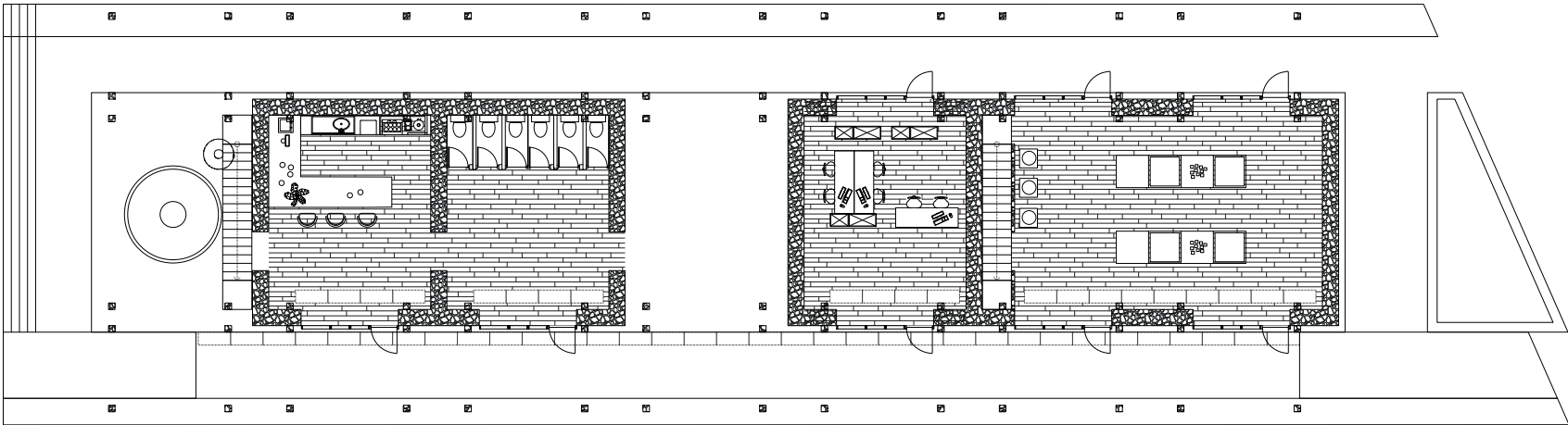


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FLOORPLAN OF COMMERCIAL ENVIRONMENT



First floor



Groundfloor

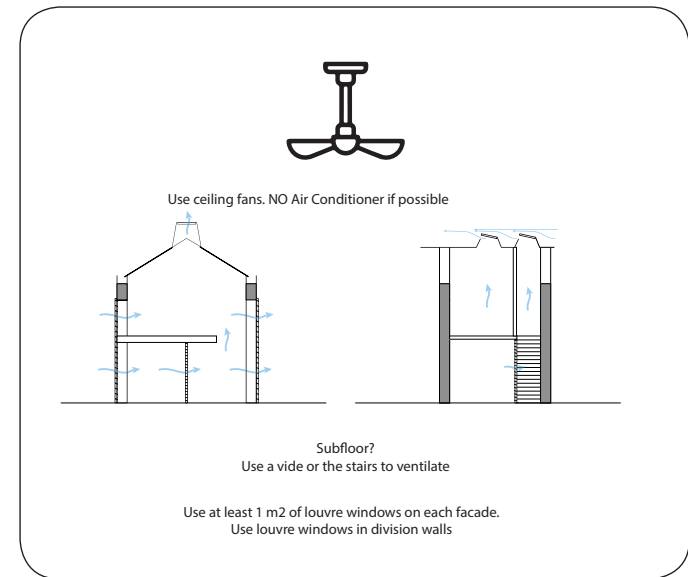
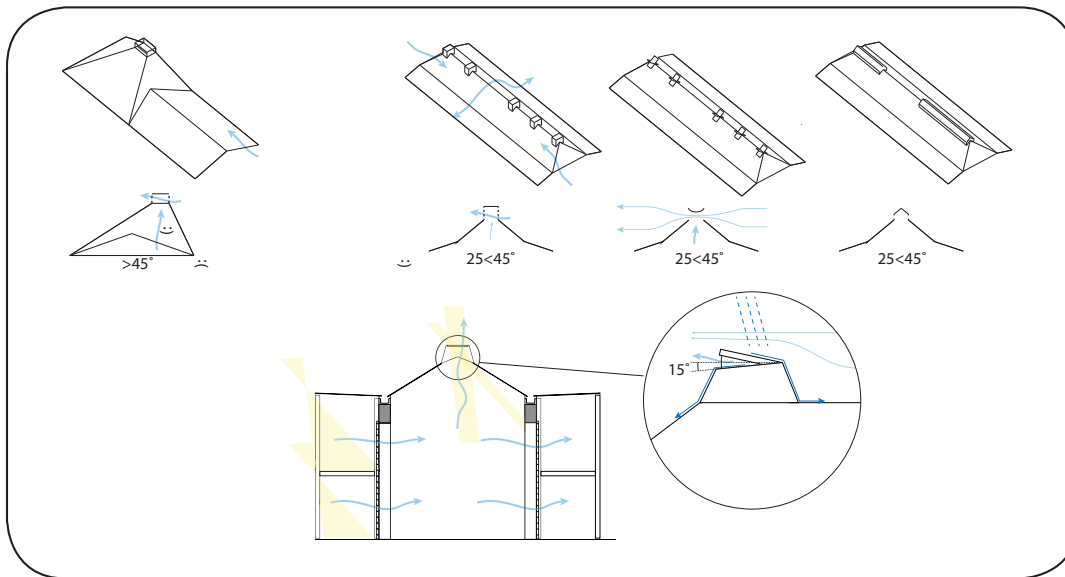
PERFORMANCE OF COMMERCIAL ENVIRONMENT



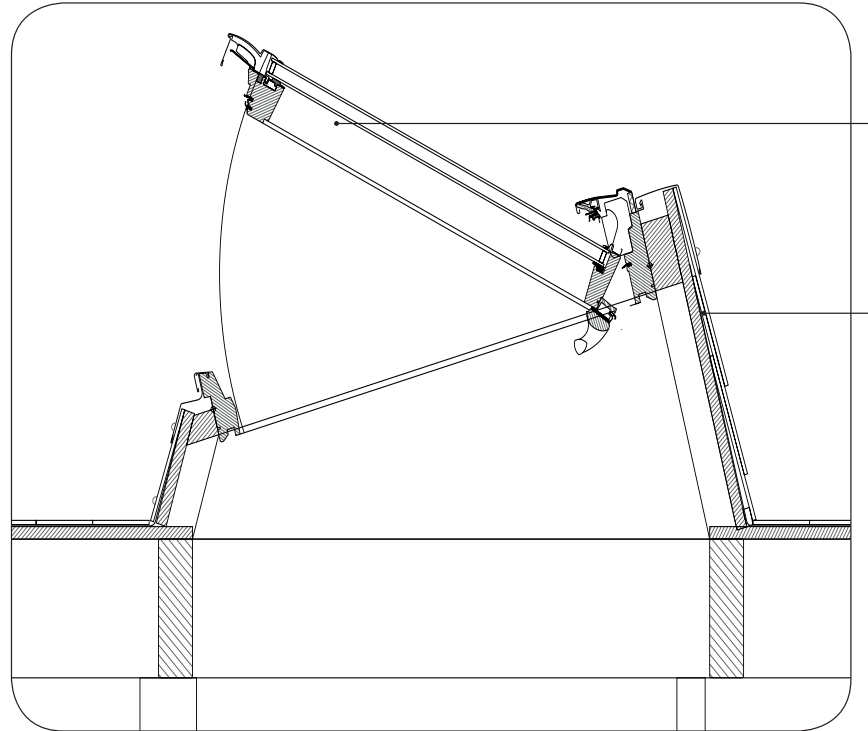
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Technique

PASSIVE CLIMATE SYSTEMS: VENTILATION AND SHADING



VENTILATION DETAIL



Openable skylight

Allows stack ventilation and increases ventilation through Venturi effect.

Supporting structure

Timer structure secured with hurricane straps

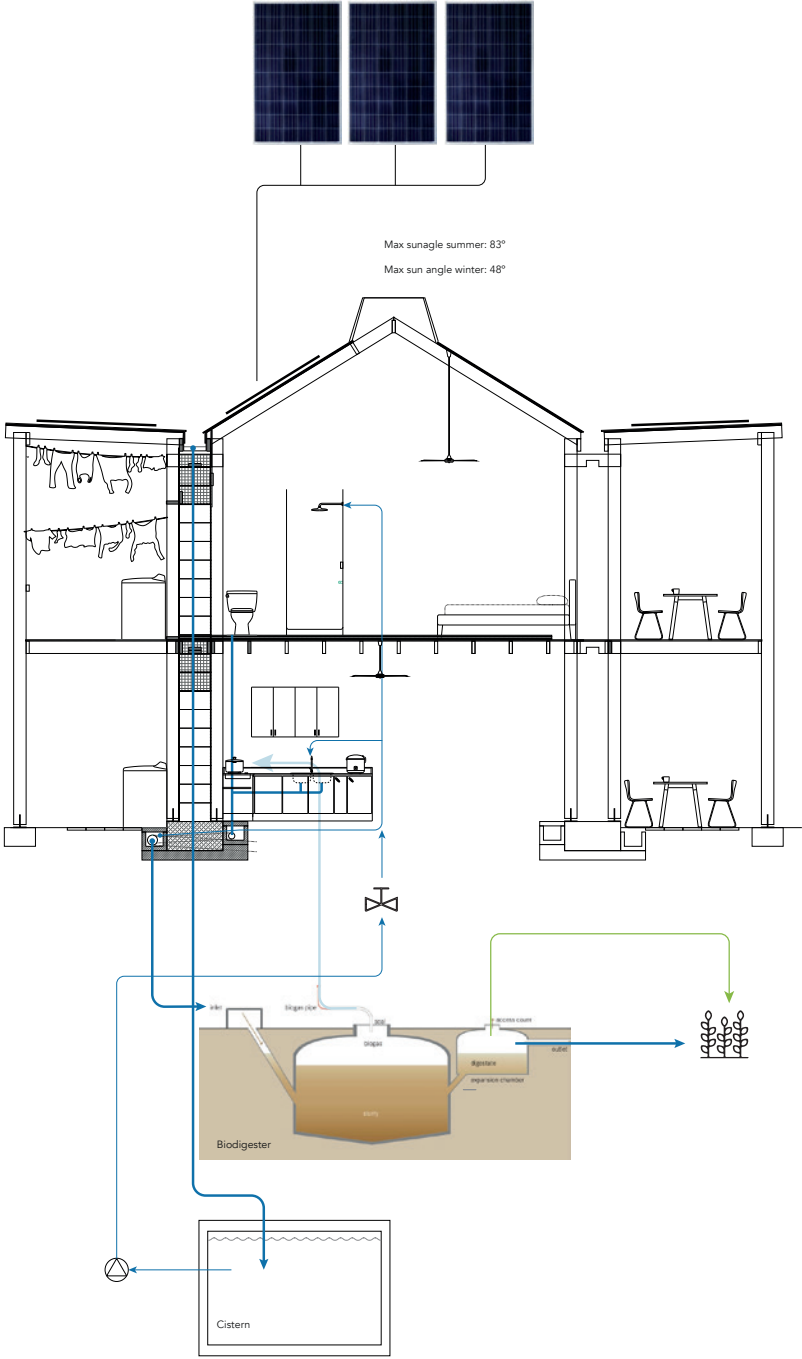
Water barrier

Shingles from recycled plastic

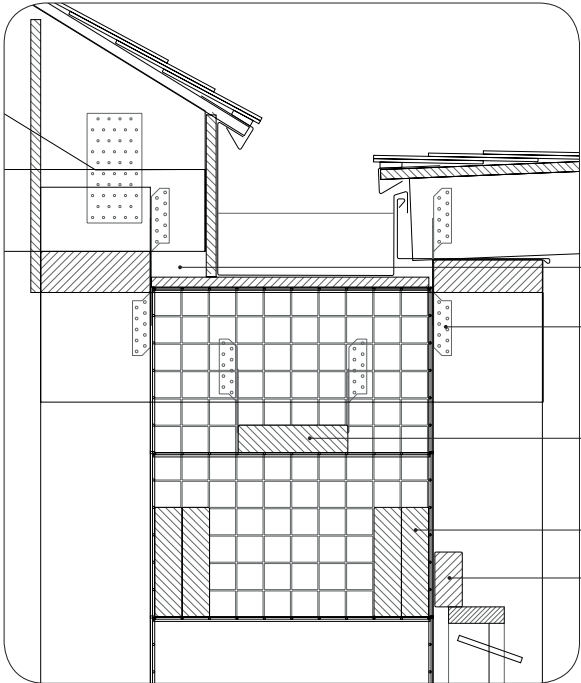
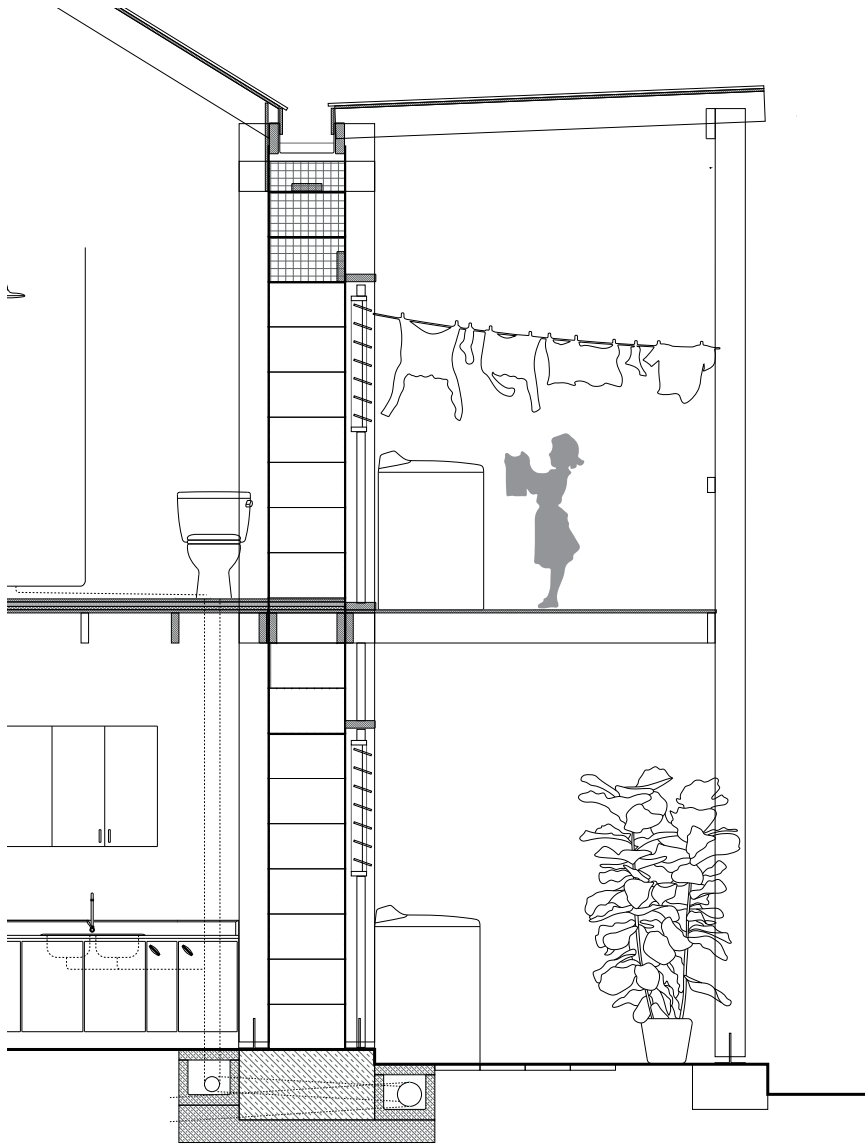
Metal hurricane strip secured with screw, washer and nut

Detail top hatch
Scale 1:5

TECHNICAL ADDITIONS



ROOF AND FOUNDATION



Detail roof
Scale 1:5

Impact

CURRENT SITUATION

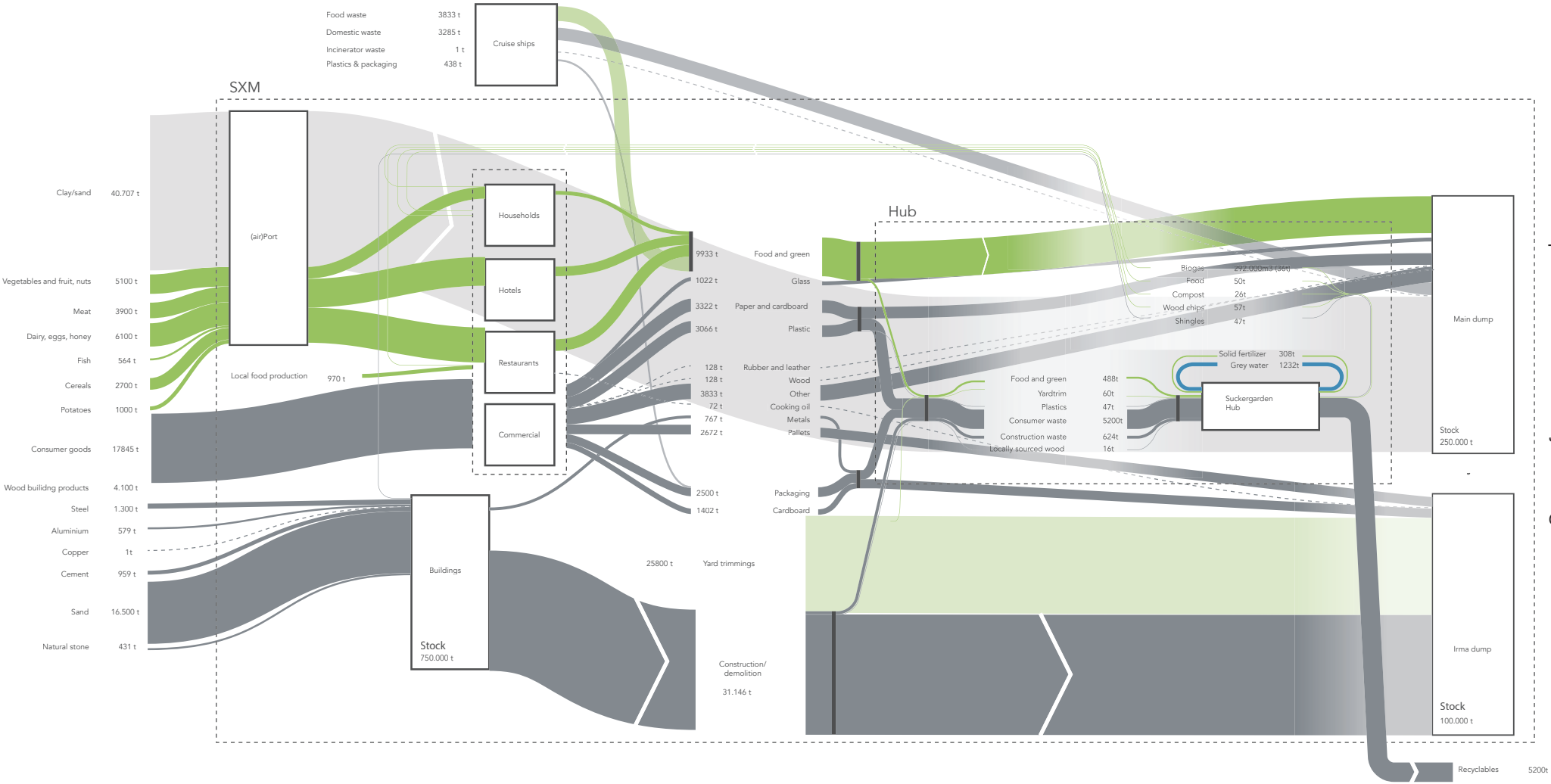


RIPPLING EFFECT TOWARDS NEIGHBORHOOD



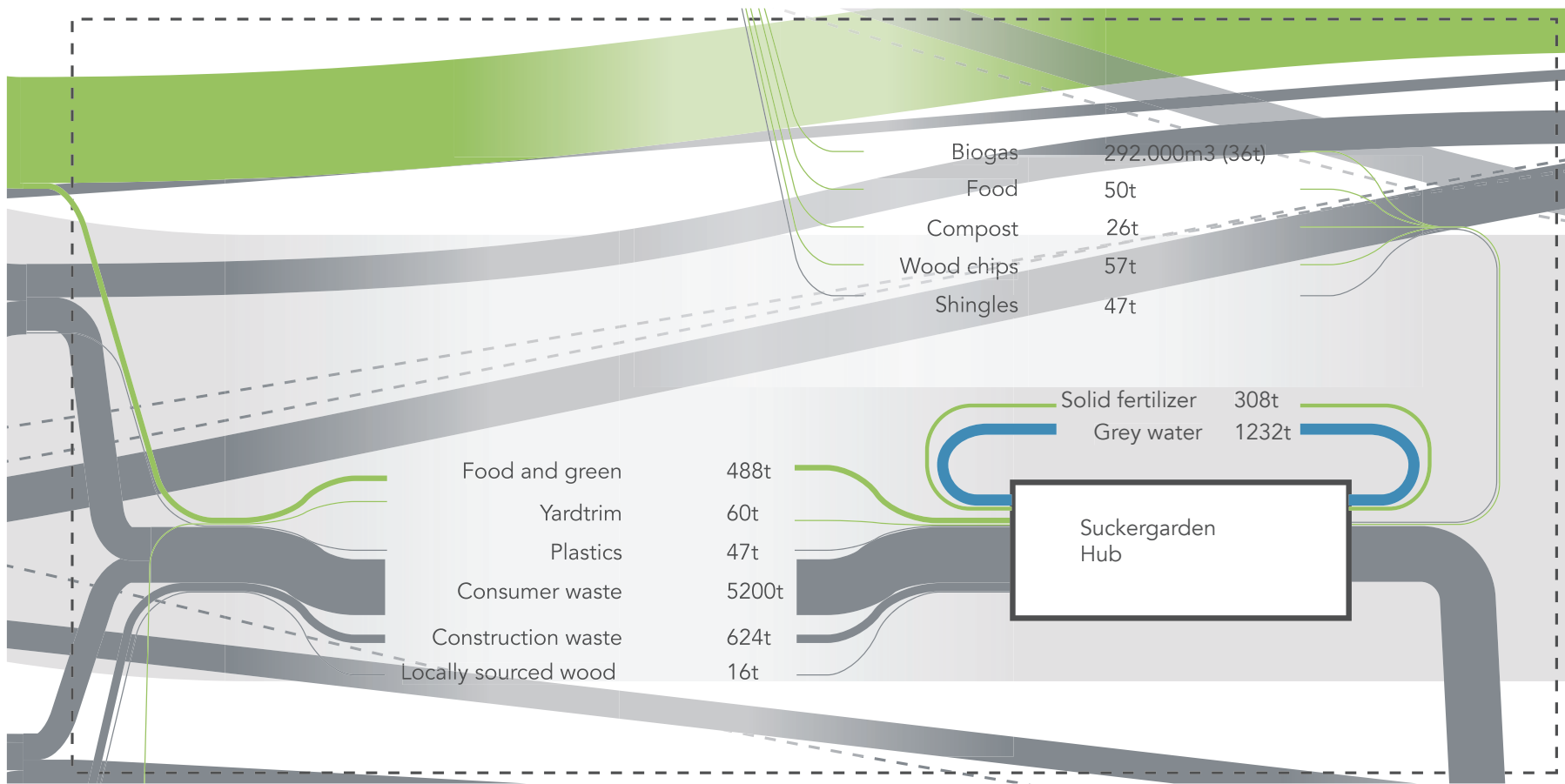
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HUB PROJECTED IN THE MFA

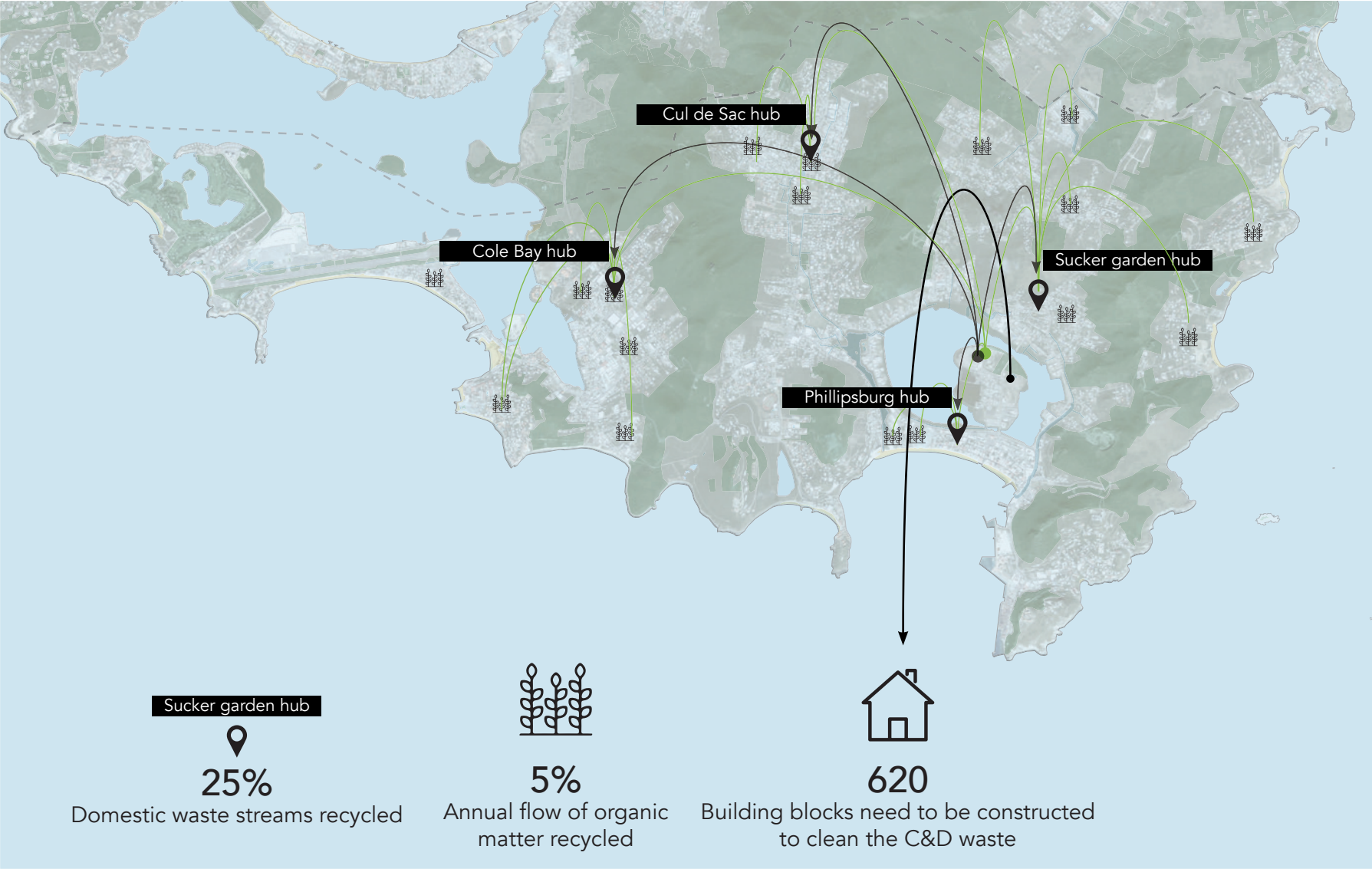


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HUB PROJECTED IN THE MFA



IMPACT OF DESIGN ON THE ISLAND



“Everyone, rich or poor, deserves a shelter for the soul.”

Samuel Mockbee, Rural Studio

Thank you!

LOCAL STAKEHOLDERS



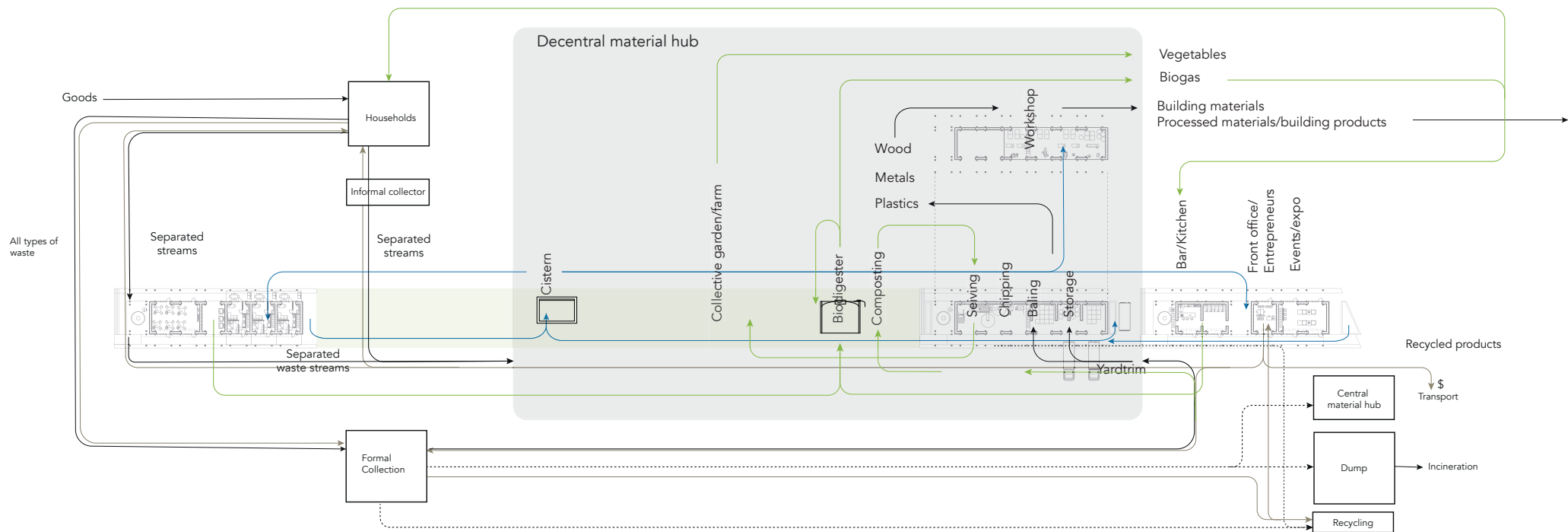
Celia - Waste2Work
Upcycle center



Gregory - Meadowlands BV
First recycling program



Alex -Green SXM
Composting program

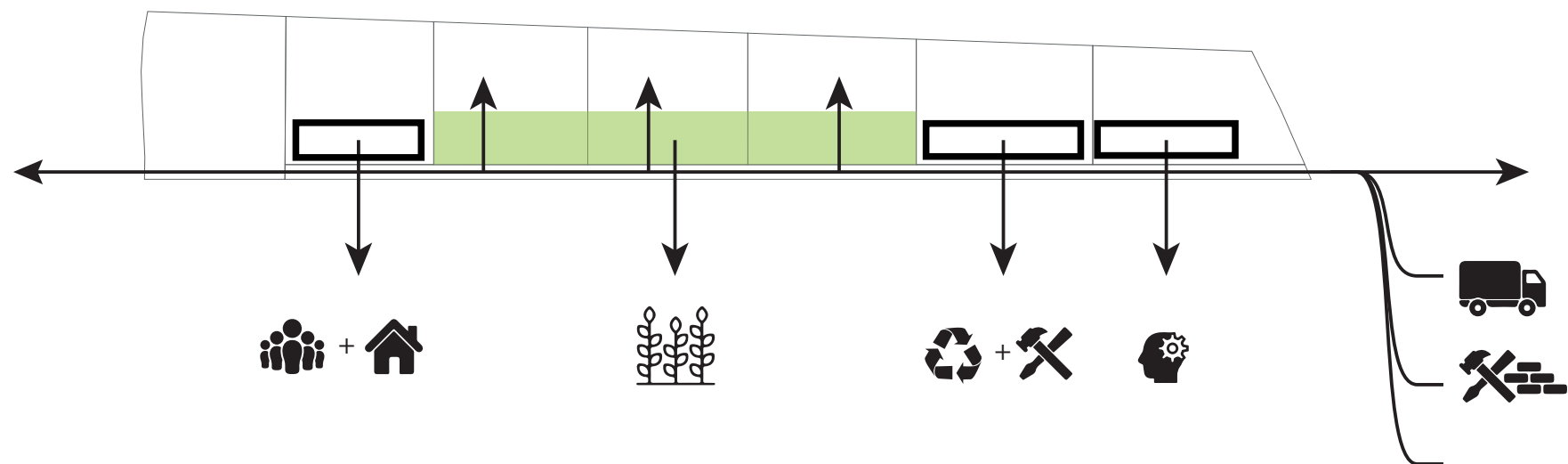


TITLE



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CONCEPT: A BACKBONE FOR DEVELOPMENT



A DECENTRAL MATERIAL HUB

