

# maternity care: Republic of Côte d'Ivoire

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introduction

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assignment

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subjects

design  
based on  
principles



# introduction

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# introduction

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feeling at home theme

# introduction

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feeling at home theme



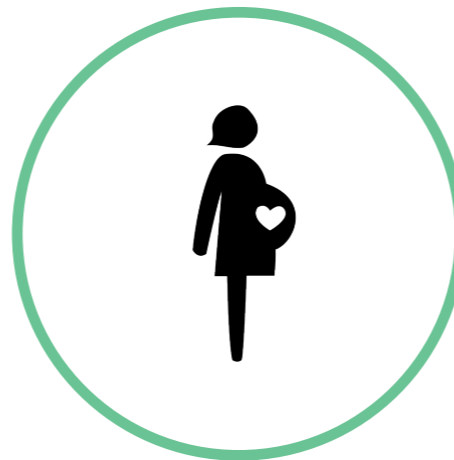
maternity care

# introduction

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feeling at home theme



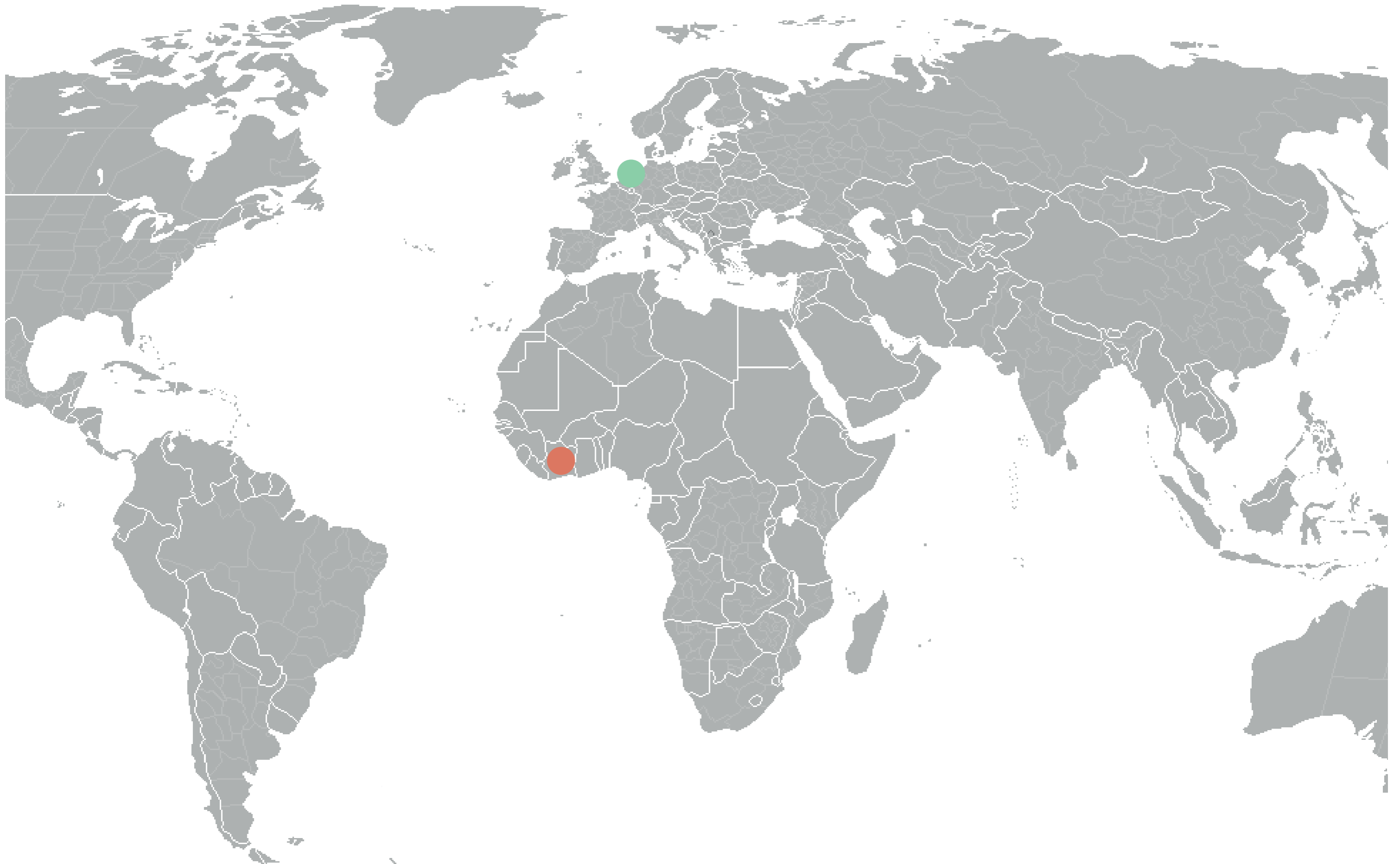
maternity care



internship

# project assignment

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# project assignment

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# project assignment

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The Republic of Côte d'Ivoire:  
National Health Development Plan  
2016-2020

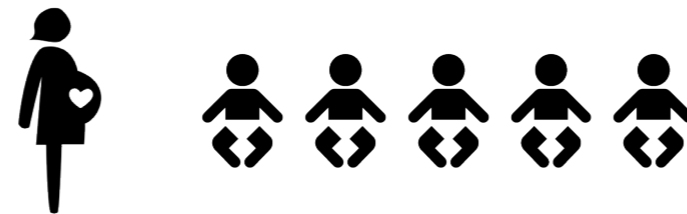
# project assignment

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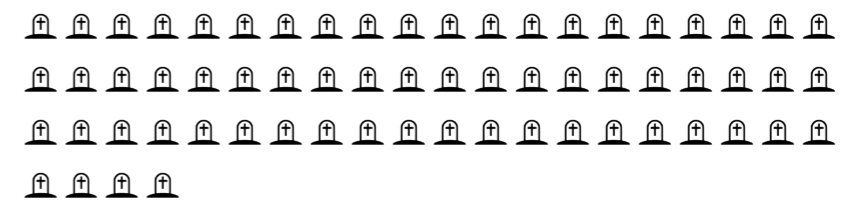
## fertility rate

## infant mortality

The Republic of Côte d'Ivoire

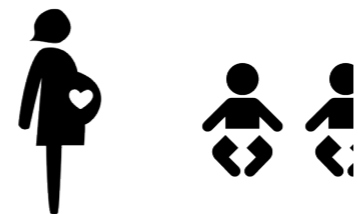


5 births per woman



64 deaths of children per 1.000 live births

The Netherlands



1,66 births per woman



3,6 deaths of children per 1.000 live births

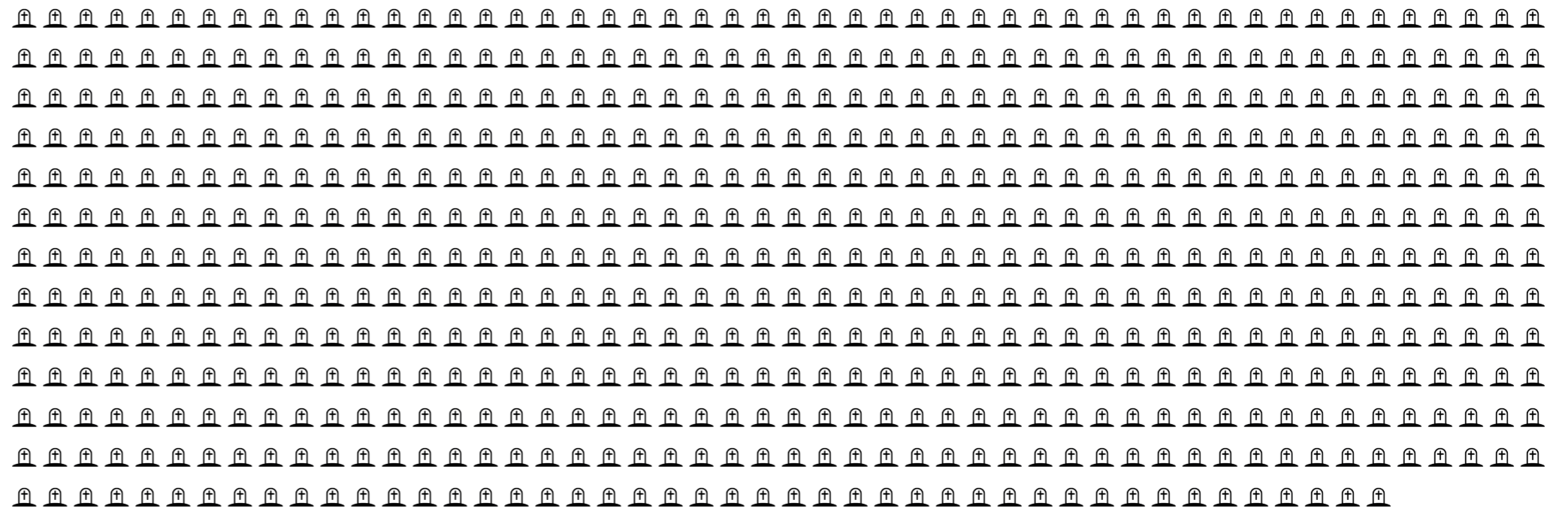


# project assignment

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## maternal mortality

The Republic of  
Côte d'Ivoire



645 deaths of mothers per 100.000 live births

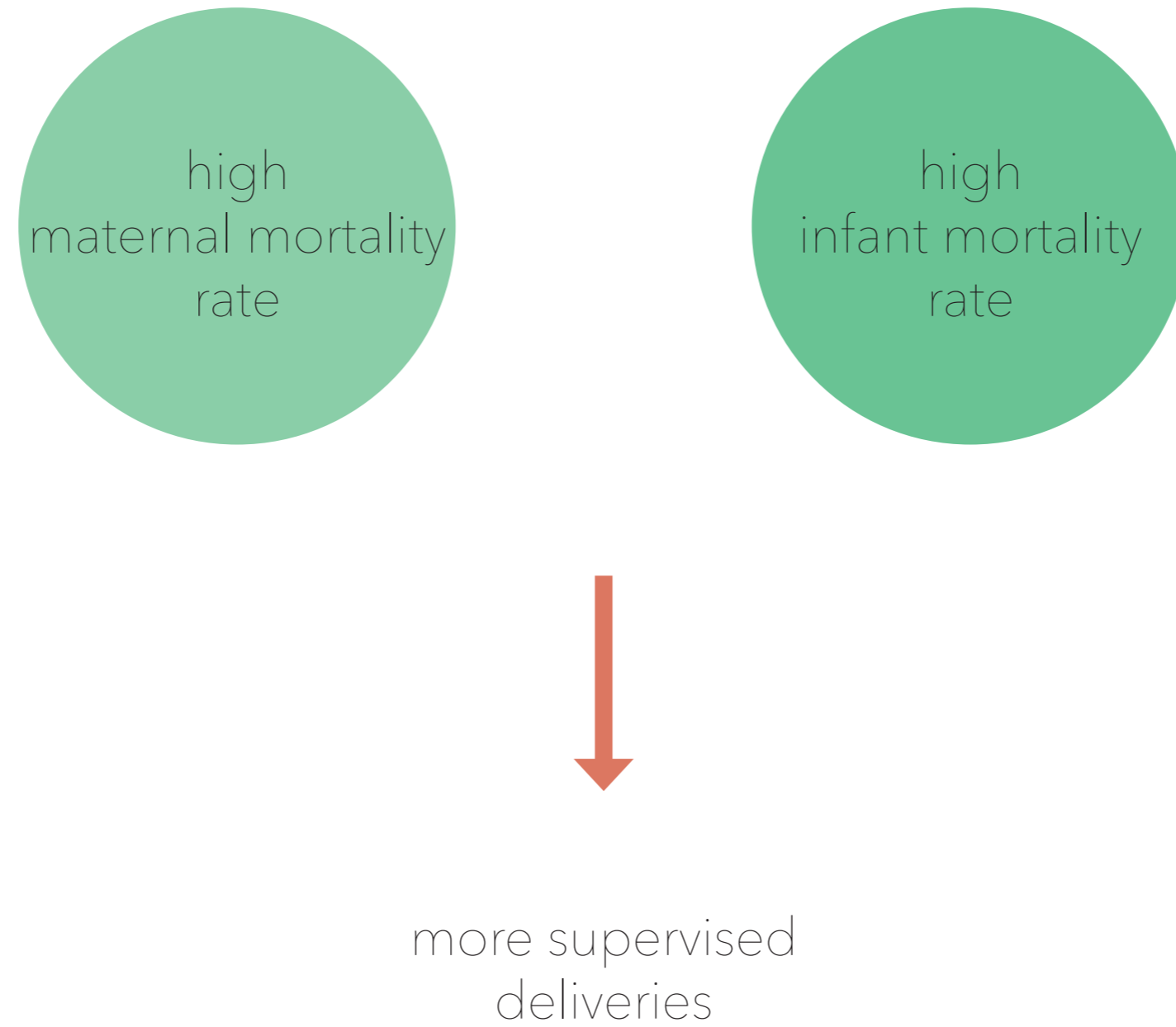
The Netherlands



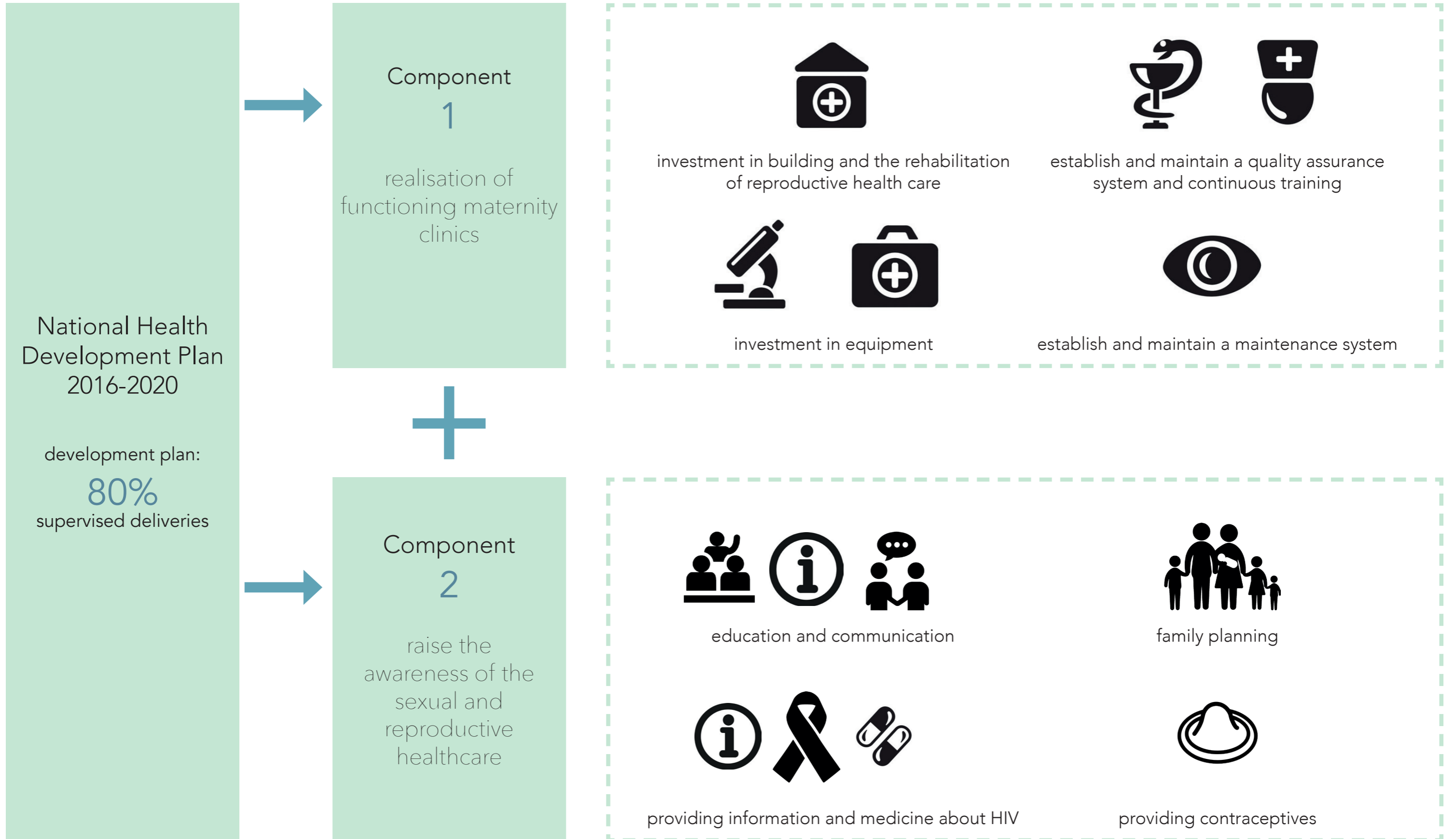
7 deaths of mothers per 100.000 live births

# project assignment

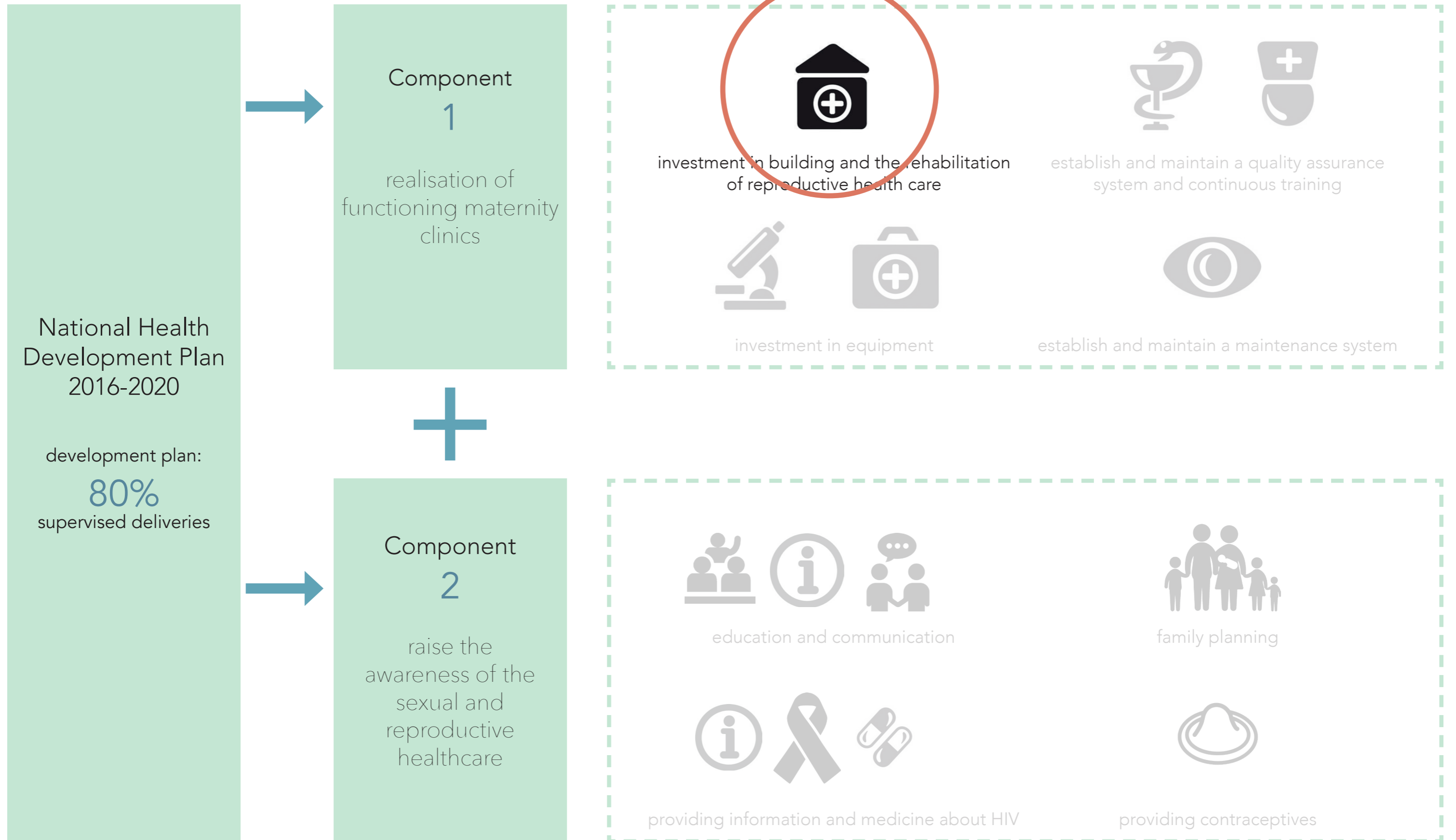
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# project assignment



# project assignment



# research subjects

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documentary  
'feeling at home'



Dutch maternity system  
'feeling at home'



The Republic of  
Côte d'Ivoire



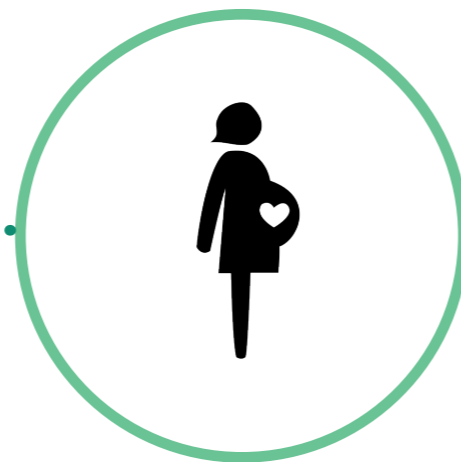
precedent studies

# research subjects

Dutch maternity system and 'feeling at home'



documentary  
'feeling at home'



Dutch maternity system  
'feeling at home'



The Republic of  
Côte d'Ivoire



precedent studies

# research subjects

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Dutch maternity system and 'feeling at home'



you have  
the option  
to withdraw

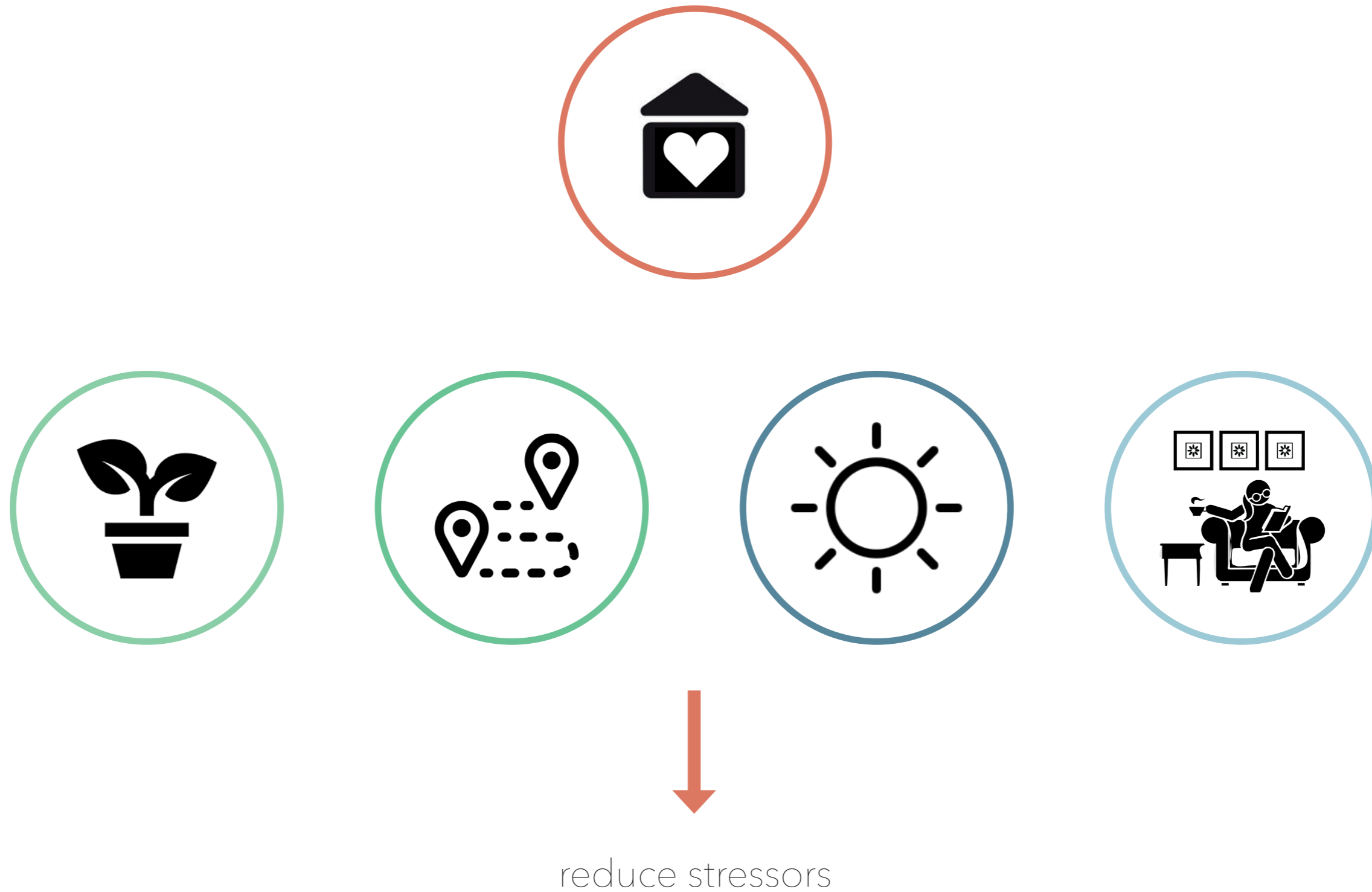
you feel  
connected

it shows your  
identity

it gives you  
the feeling  
of control

# research subjects

Dutch maternity system and 'feeling at home'





# research subjects

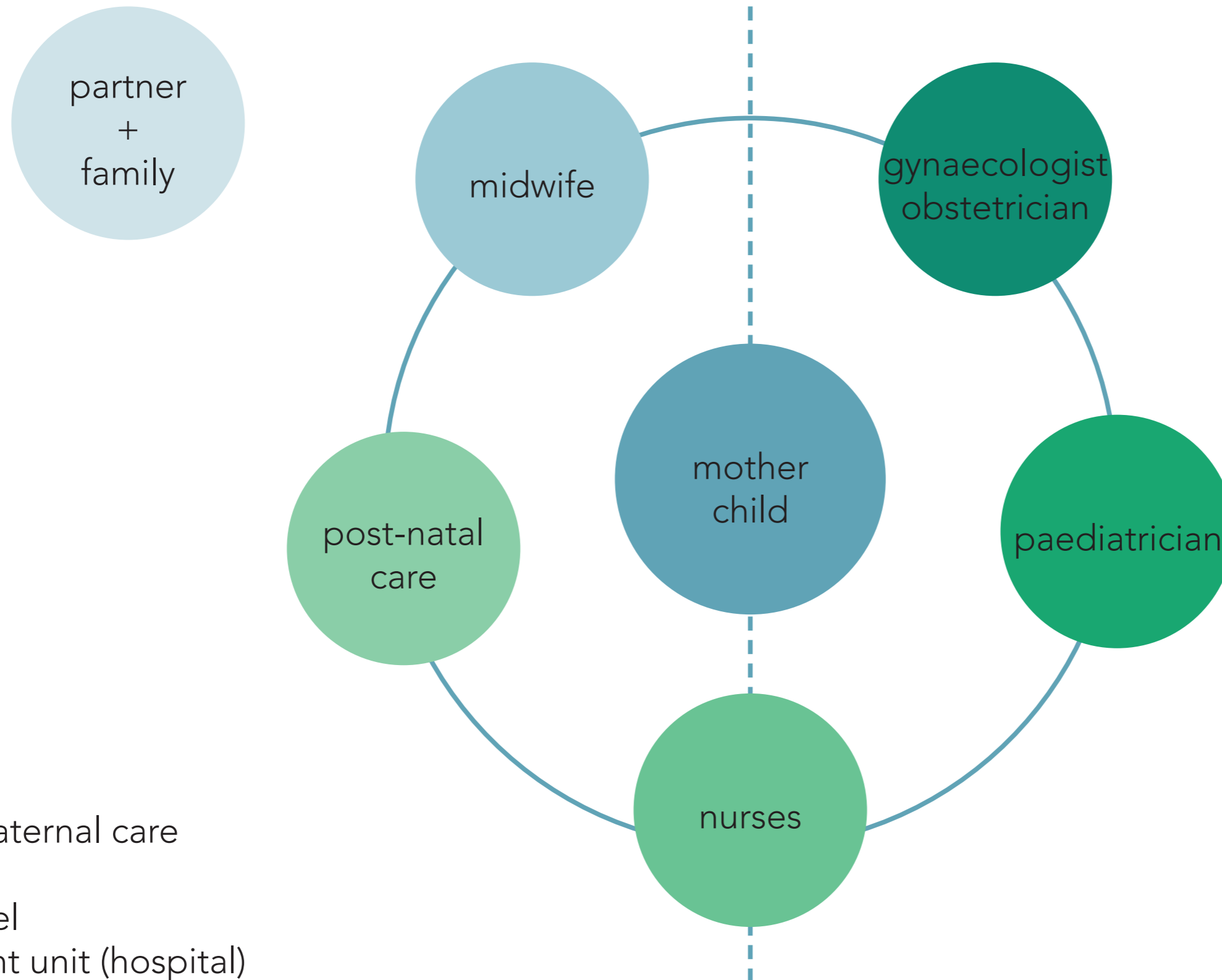
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Dutch maternity system and 'feeling at home'



# research subjects

Dutch maternity system and 'feeling at home'



Primary maternal care  
- at home  
- birth hotel  
- outpatient unit (hospital)

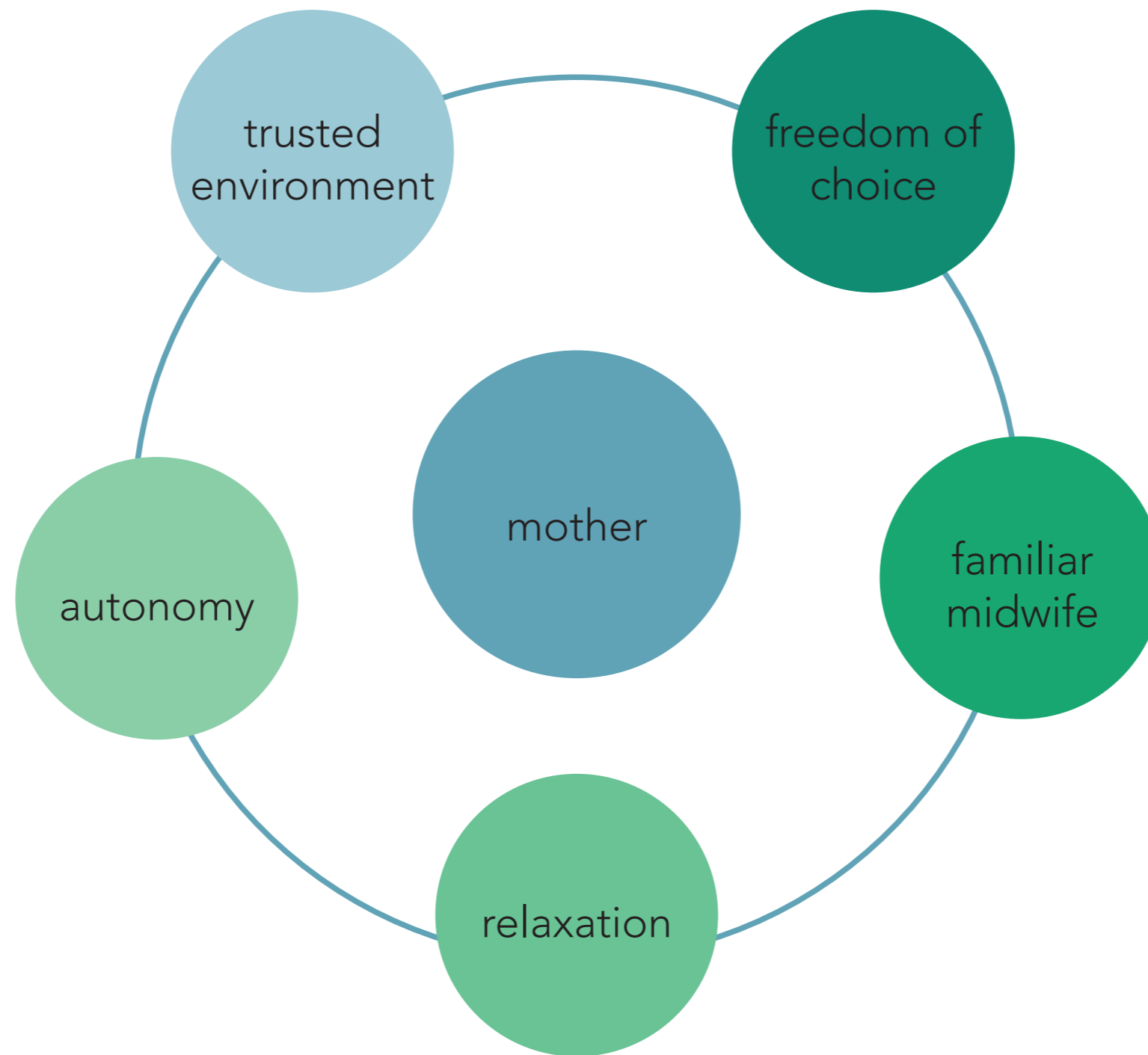
Secondary maternal care  
- inpatient unit (hospital)

Tertiary maternal care  
- academic hospital

# research subjects

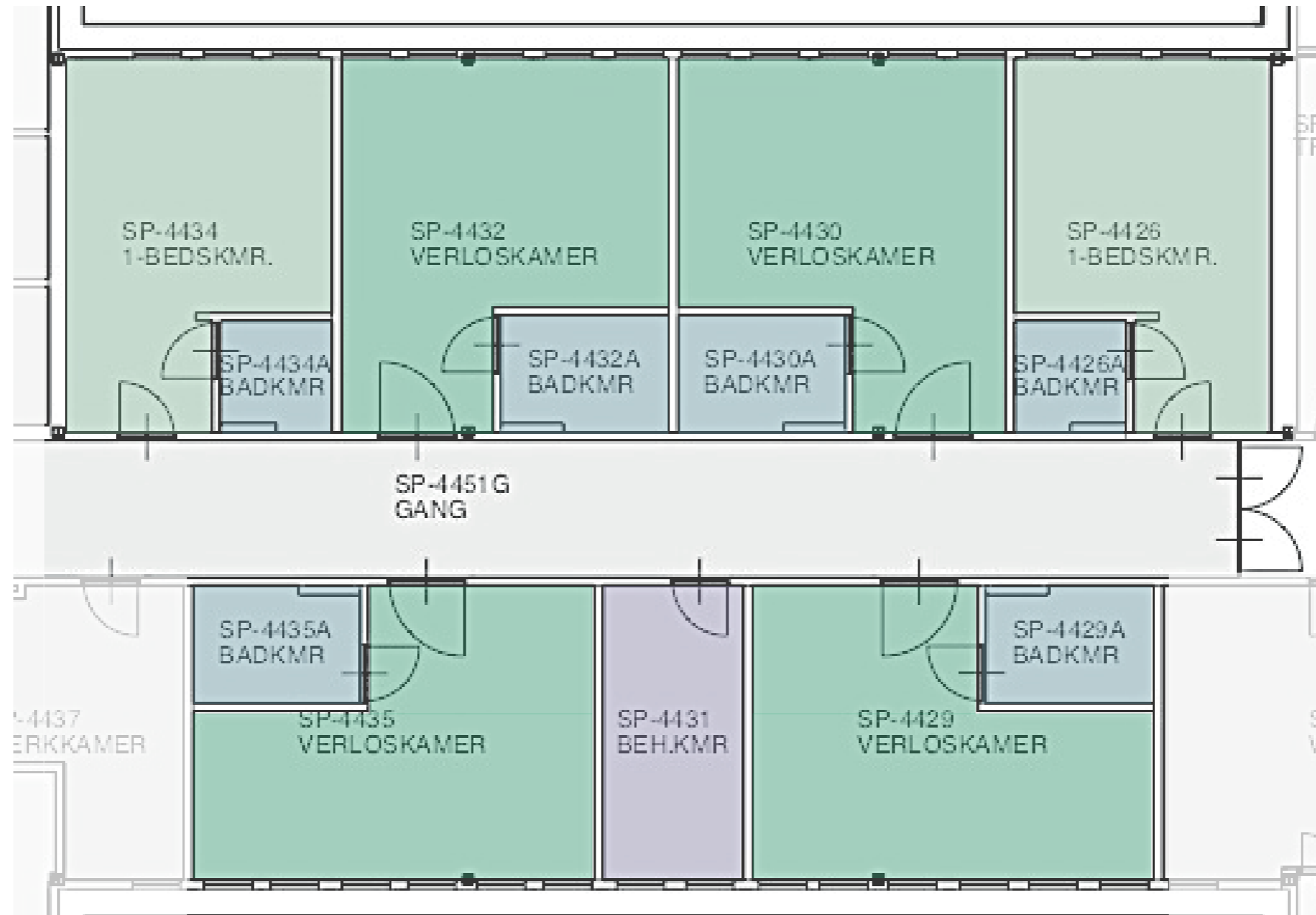
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Dutch maternity system and 'feeling at home'



# research subjects

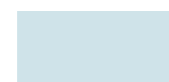
Dutch maternity system and 'feeling at home'



delivery room



1 bed room



bathroom

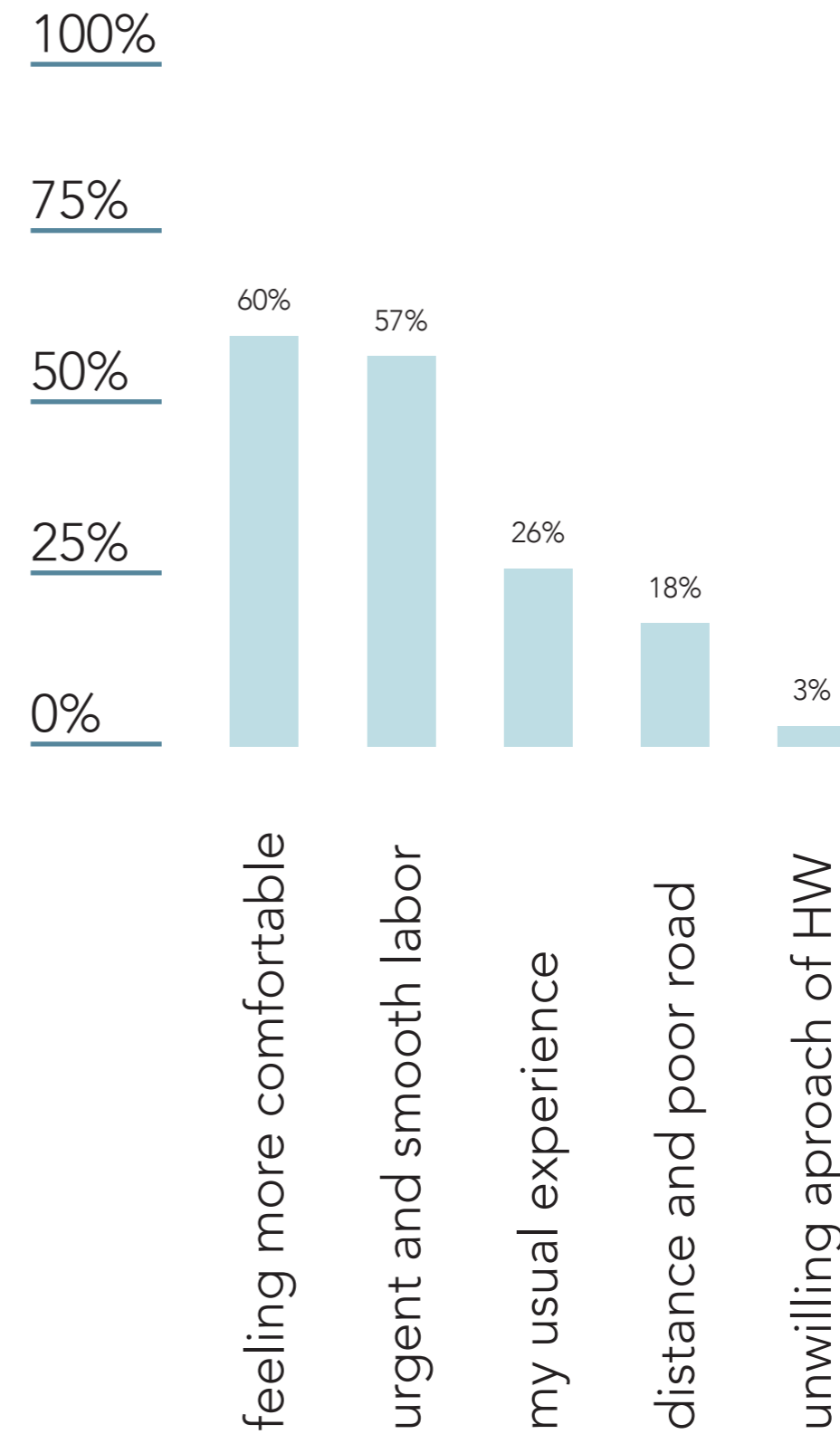


treatment room



# research subjects

Dutch maternity system and 'feeling at home'



Source: reasons for home delivery among study subjects in Alamanta District, North East Ethiopia, 2013  
HW = Health Workers

# research subjects

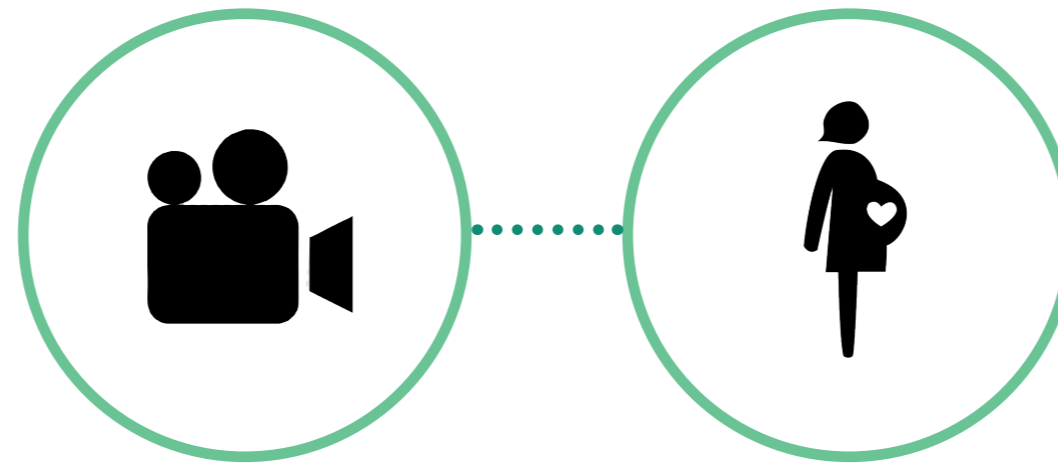
Dutch maternity system and 'feeling at home'



human scale and a familiar environment



natural daylight and green environment



privacy and control



reduce movement

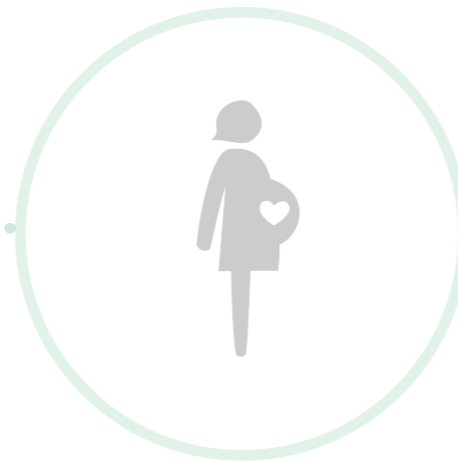


# research subjects

The Republic of Côte d'Ivoire



documentary  
'feeling at home'



Dutch maternity system  
'feeling at home'



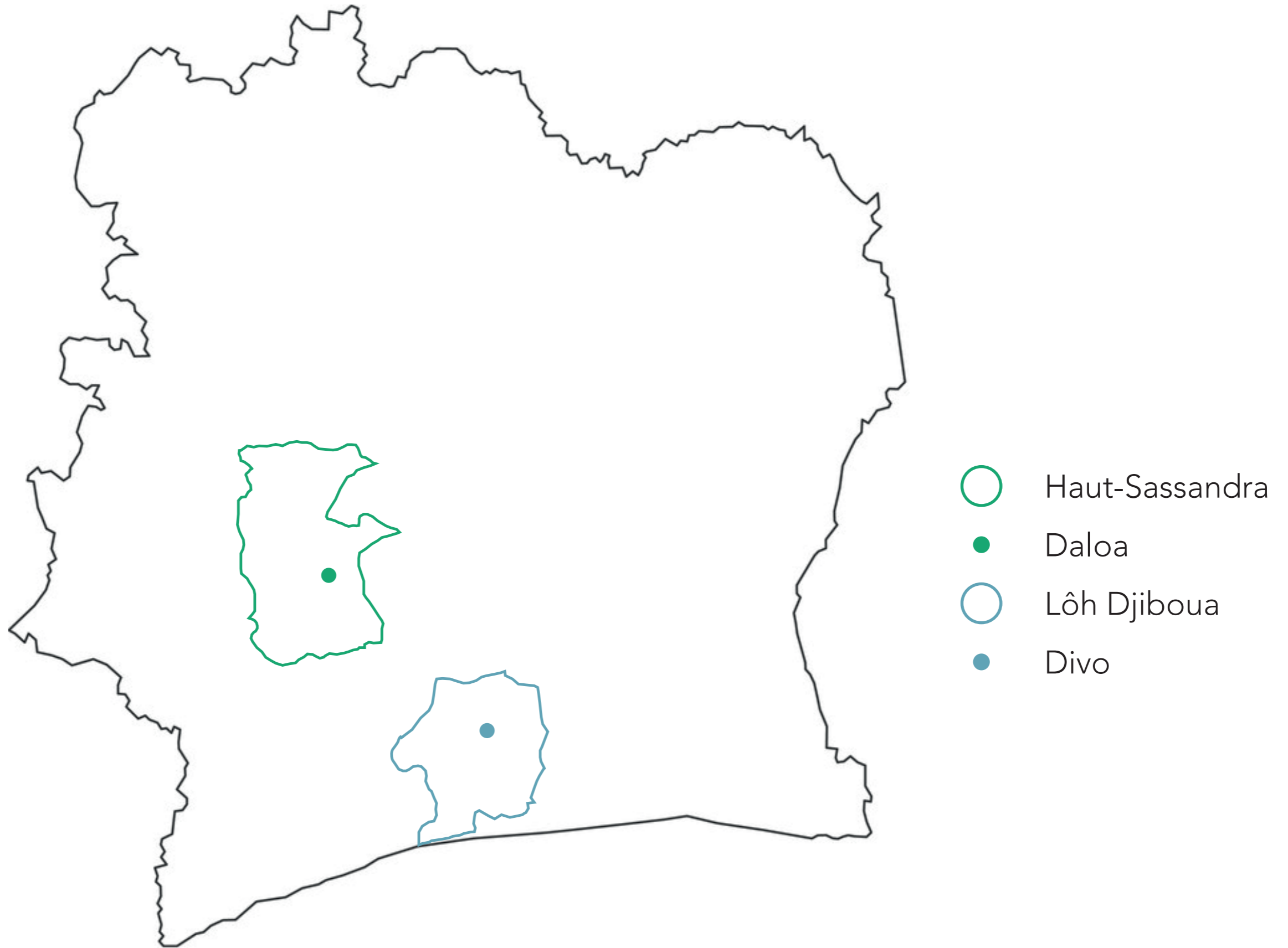
The Republic of  
Côte d'Ivoire



precedent studies

# research subjects

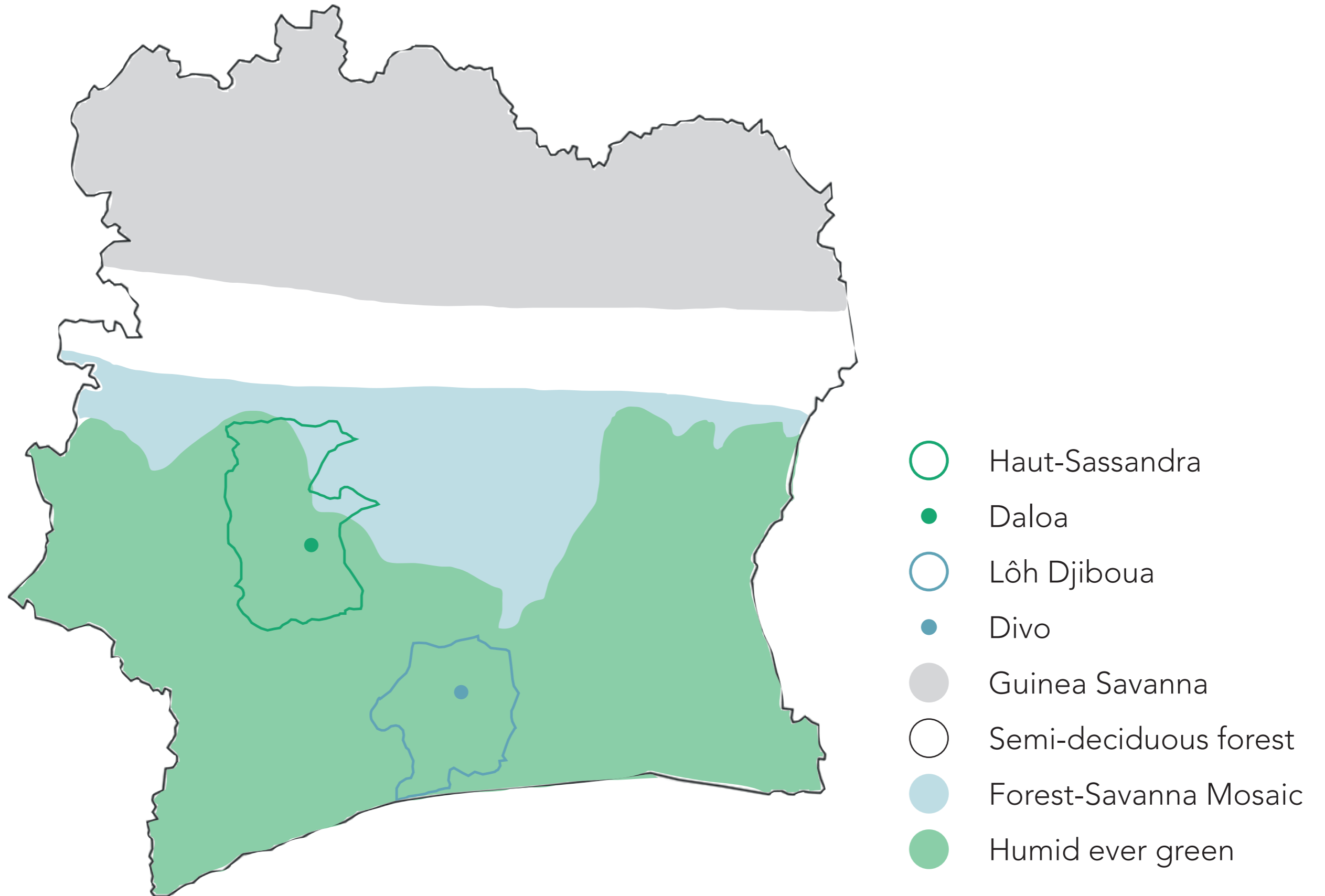
The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire

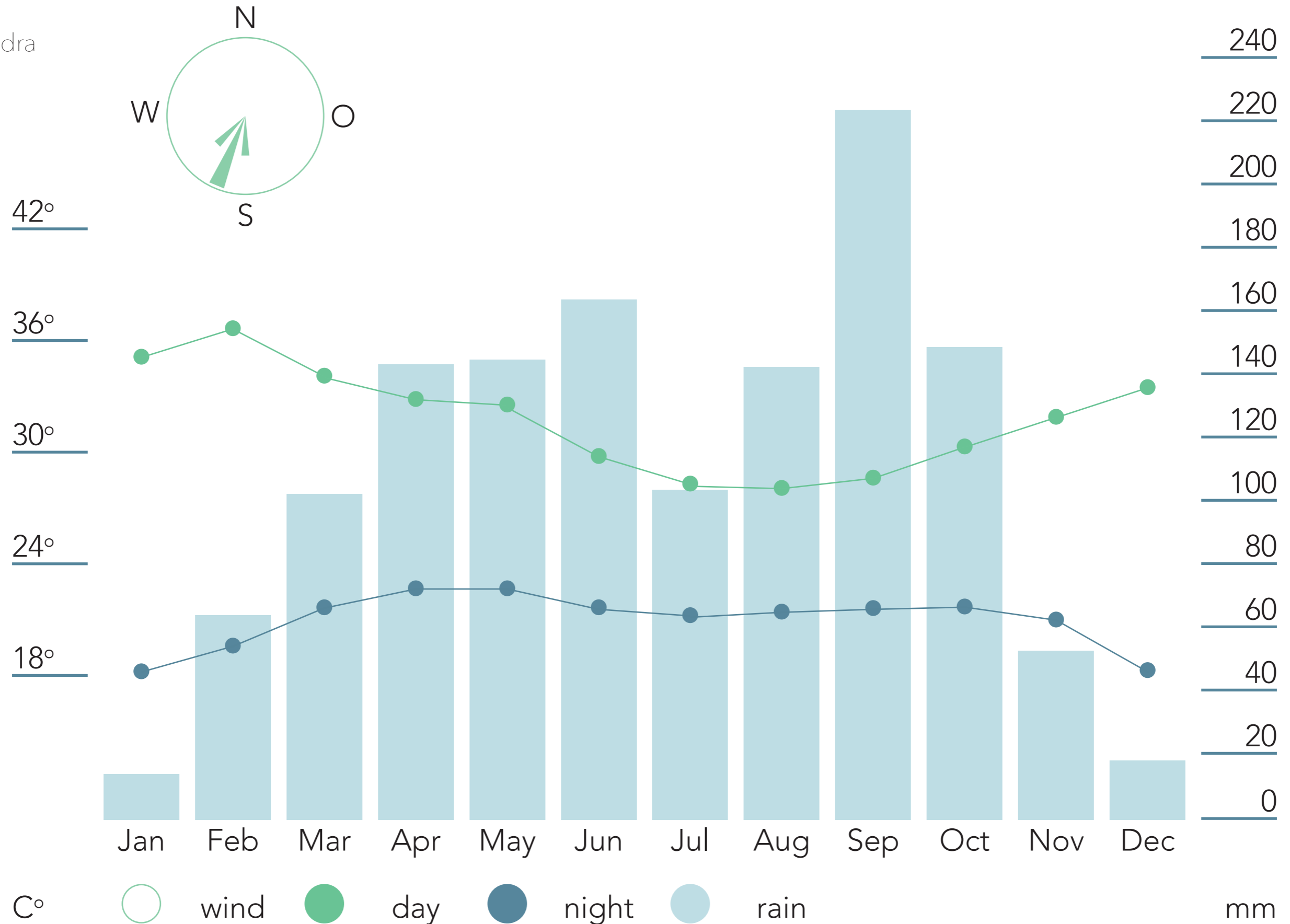


# research subjects

The Republic of Côte d'Ivoire

## Daloa

Haut-Sassandra

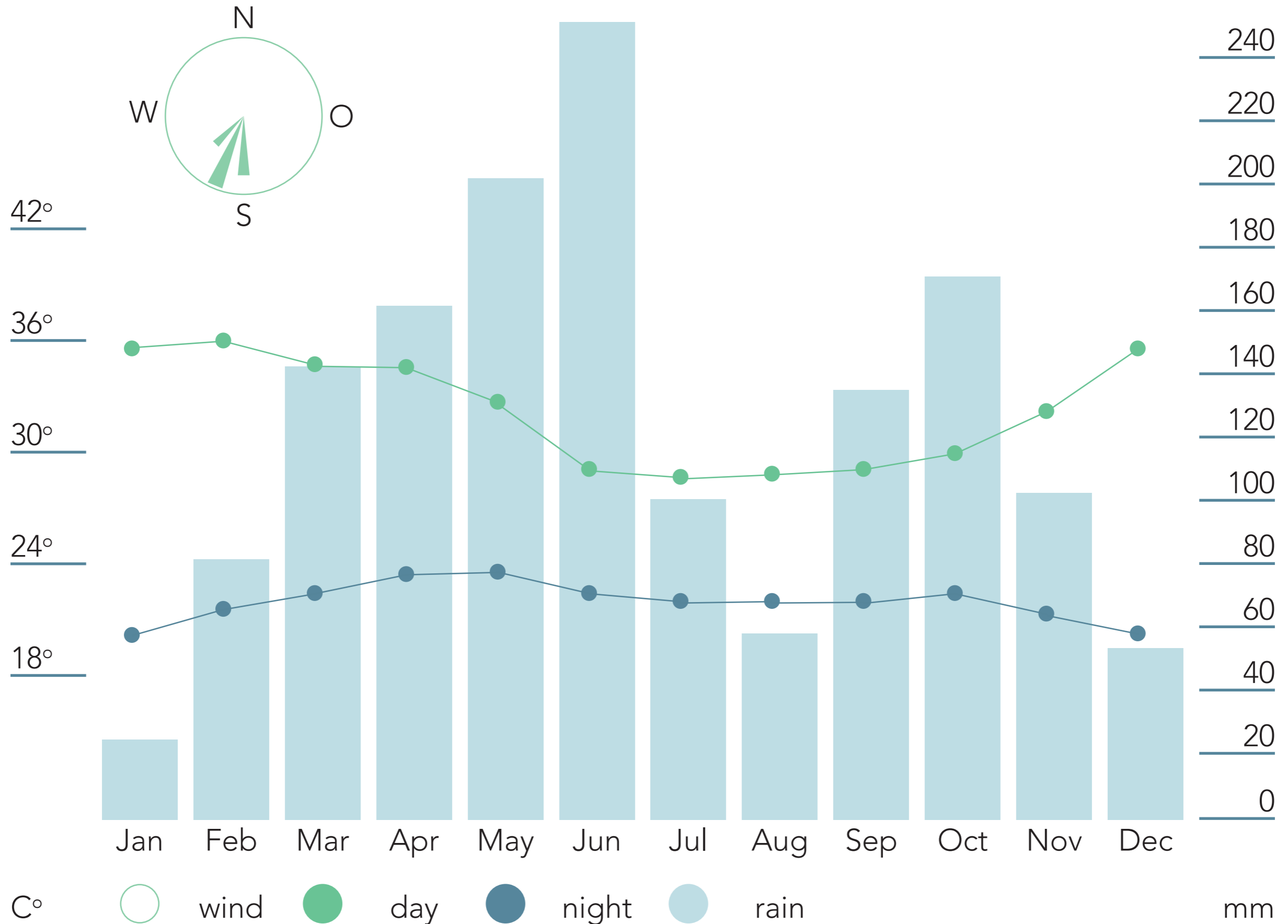


# research subjects

The Republic of Côte d'Ivoire

## Divo

Lôh Djiboua





# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire



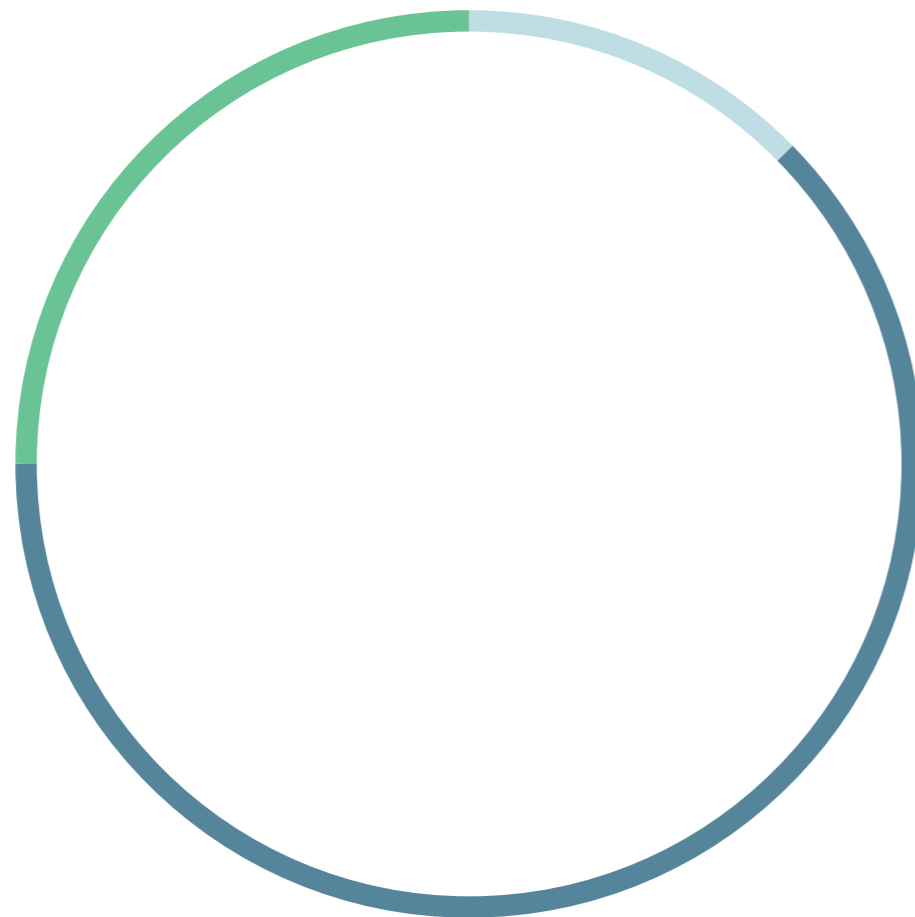


# research subjects

The Republic of Côte d'Ivoire

Religions:

●	Traditional Tribal religions	63%
●	Islamic	25%
●	Christian	12%



*La Grande Mosquée de Yamoussoukro*



*La Grande Mosquée de Kong*

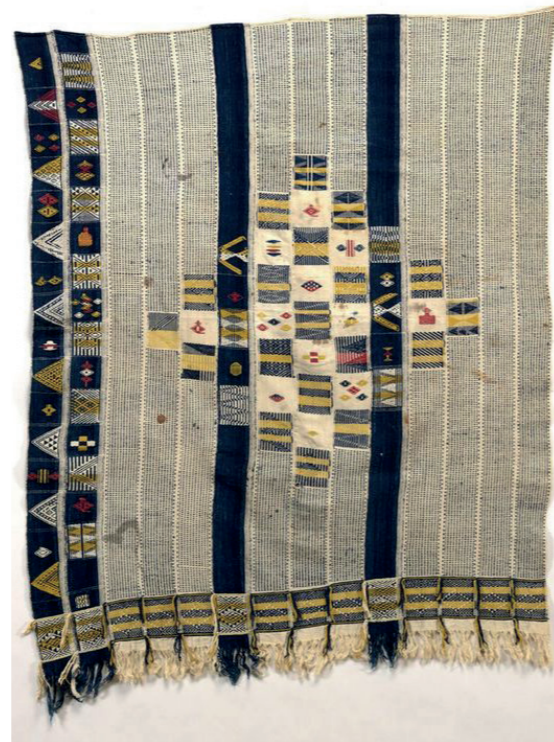


# research subjects

The Republic of Côte d'Ivoire



By: The SMA African Art Museum



By: P. Pailler



By: Sotheby's



By: Hot Moon Collection



# research subjects

The Republic of Côte d'Ivoire





# research subjects

The Republic of Côte d'Ivoire



Cocoa farm, by: Be Fair



House in West Côte d'Ivoire By: Habitat for Humanity





# research subjects

The Republic of Côte d'Ivoire



Centre de sante de MENEKE , Bas-Sassandra

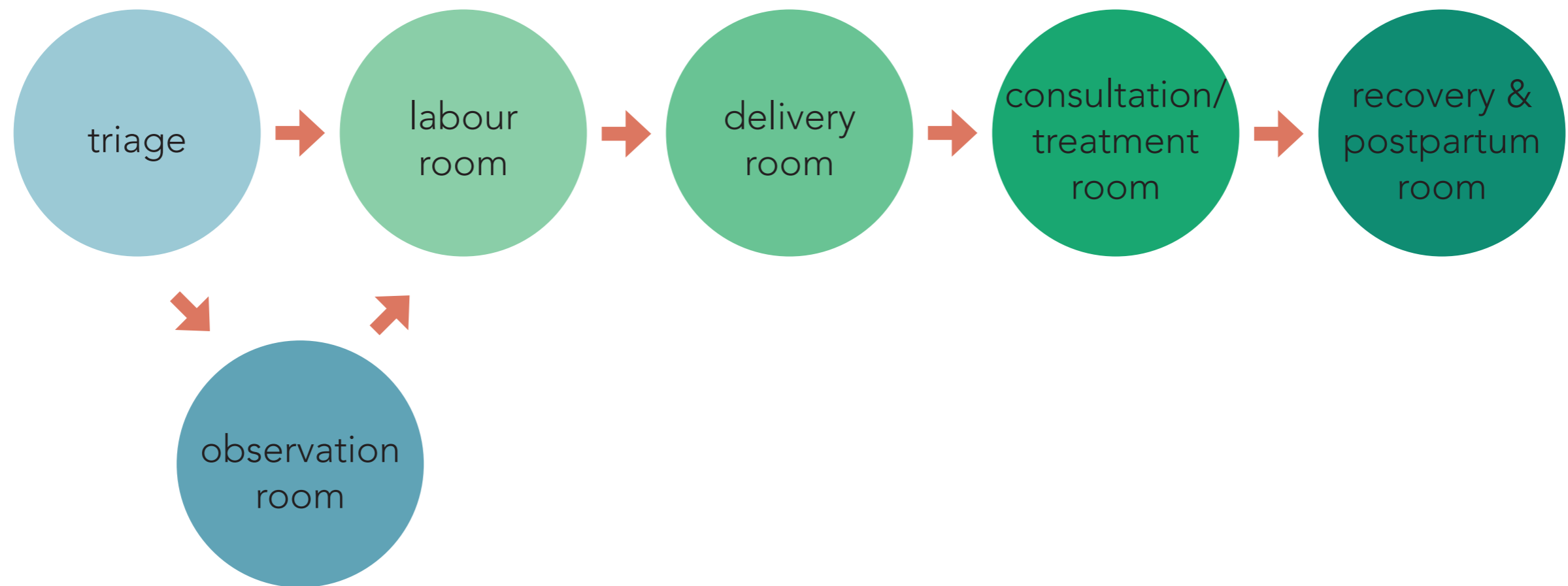


Centre de sante regional BAHOUFLA, Haut-Sassandra



# research subjects

The Republic of Côte d'Ivoire



# research subjects

The Republic of Côte d'Ivoire



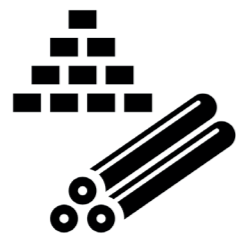
invariably climate



outdoor is indoor



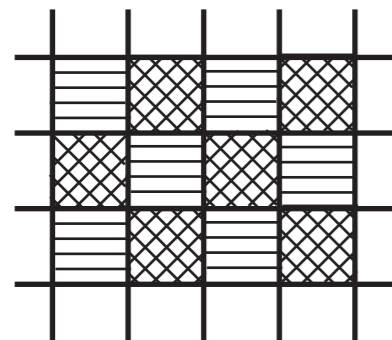
building type: maternity



local products



security



patterns



building method: rural area



movement

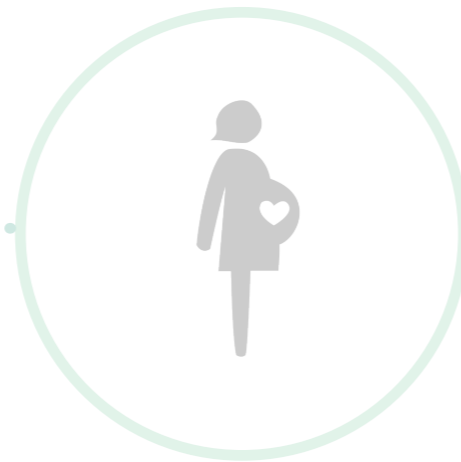


# research subjects

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documentary  
'feeling at home'



Dutch maternity system  
'feeling at home'



The Republic of  
Côte d'Ivoire



precedent studies



# research subjects

precedent studies

private

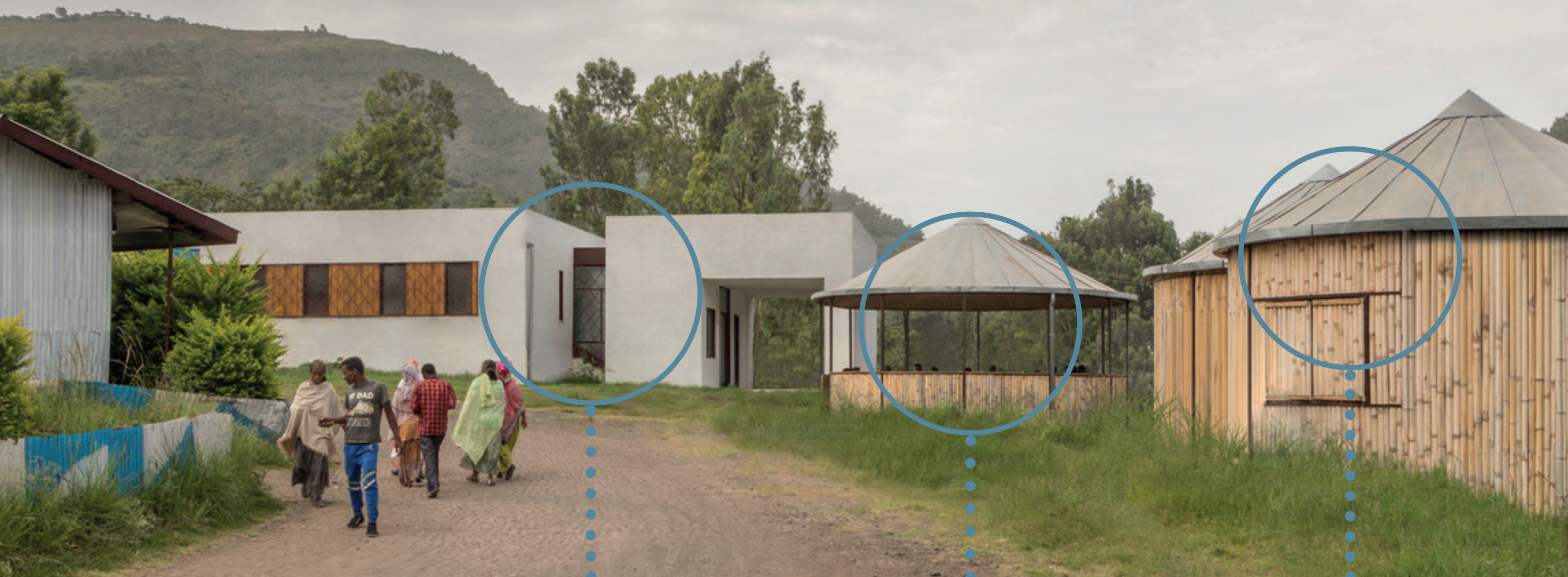
public

surgery

maternity ward

waiting area

mothers home



Function: Maternity Centre  
Location: Woldiya, Ethiopia  
Architect: Vilalta Arquitecta (ES)

western design

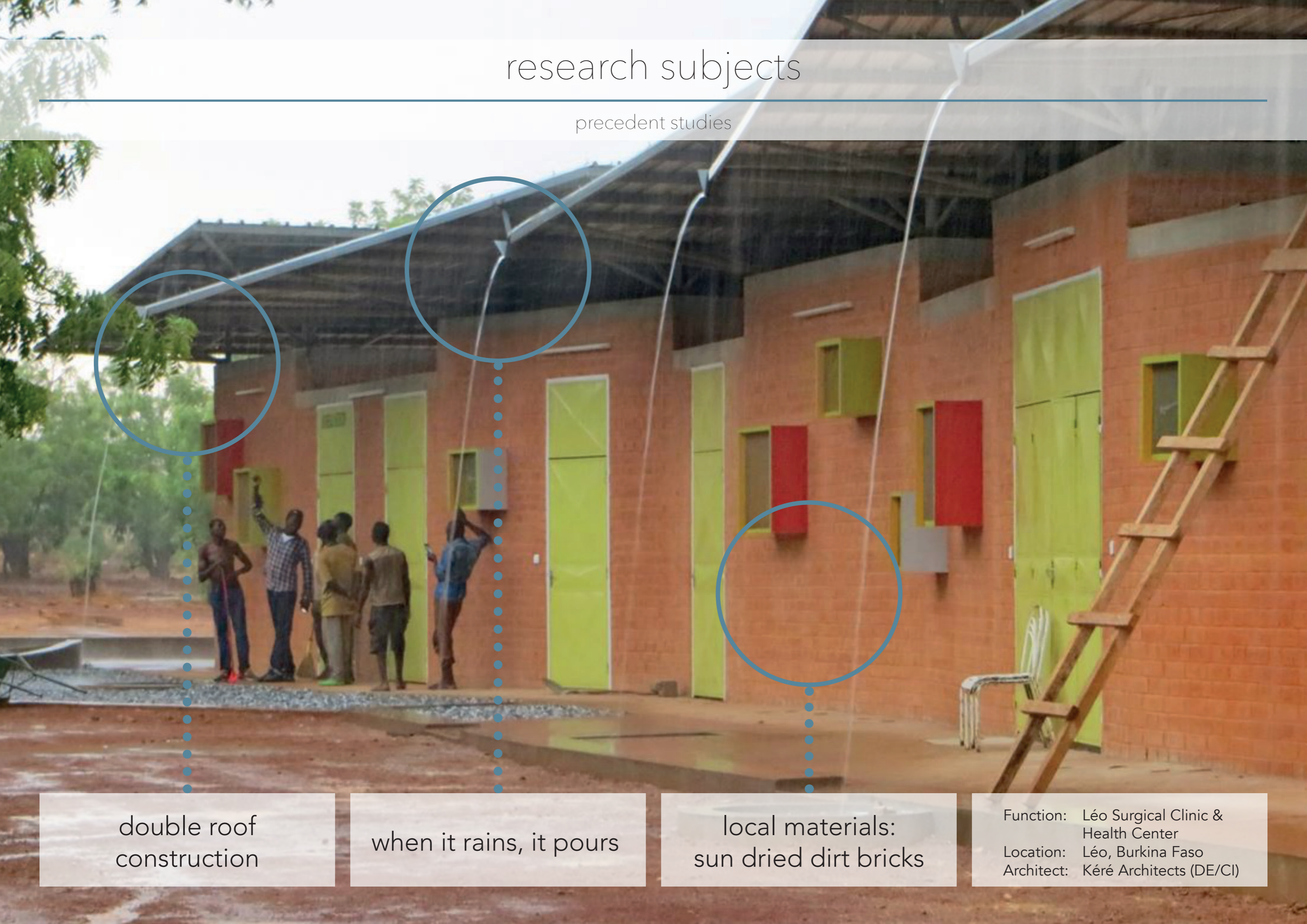
living room area

mothers home:  
local scale



# research subjects

precedent studies



double roof  
construction

when it rains, it pours

local materials:  
sun dried dirt bricks

Function: Léo Surgical Clinic &  
Health Center  
Location: Léo, Burkina Faso  
Architect: Kéré Architects (DE/CI)



# research subjects

precedent studies



natural lighting

connection to the outside

local materials:  
coconut leaves

Function: Maternity Hospital Unit  
Location: Bukavu, Congo  
Architect: White Arkitekter (DK)





# research subjects

precedent studies



Function: Primary school  
Location: Gando, Burkina Faso  
Architect: Kéré Architects (DE/CI)

comunal spaces

overarching roof

one function, one block



# research subjects

precedent studies



Function: Primary school  
Location: Gangouroubouro, Mali  
Architect: LEVS (NL)

overarching roof

load bearing  
construction

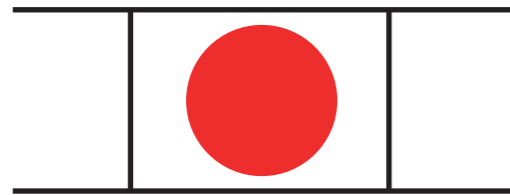
transitional area  
public - private



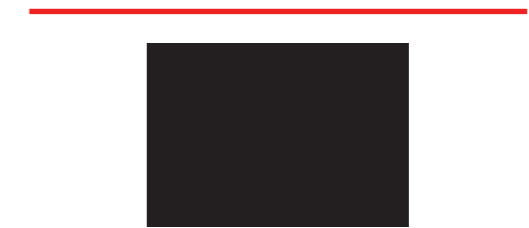


# research subjects

precedent studies



enclosed main function



building + roof



outdoor routing



overarching roof



public to private



mound

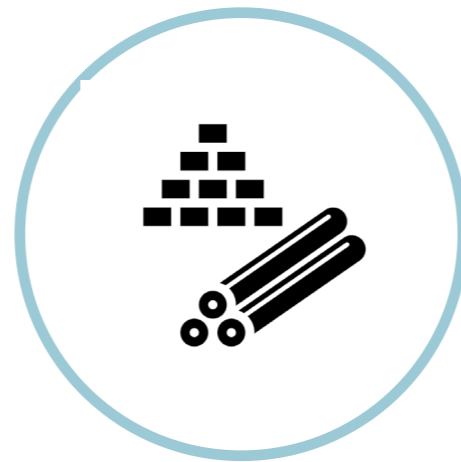


# design principles

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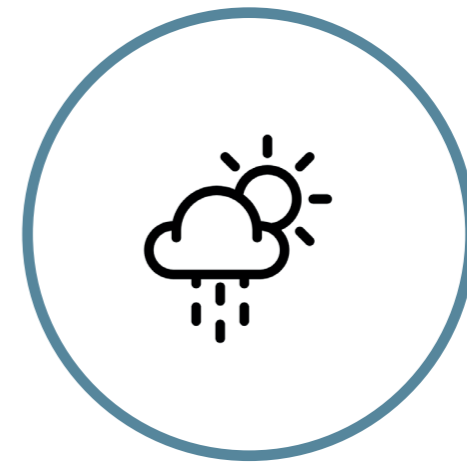
clear routing



local materials



local craftsman

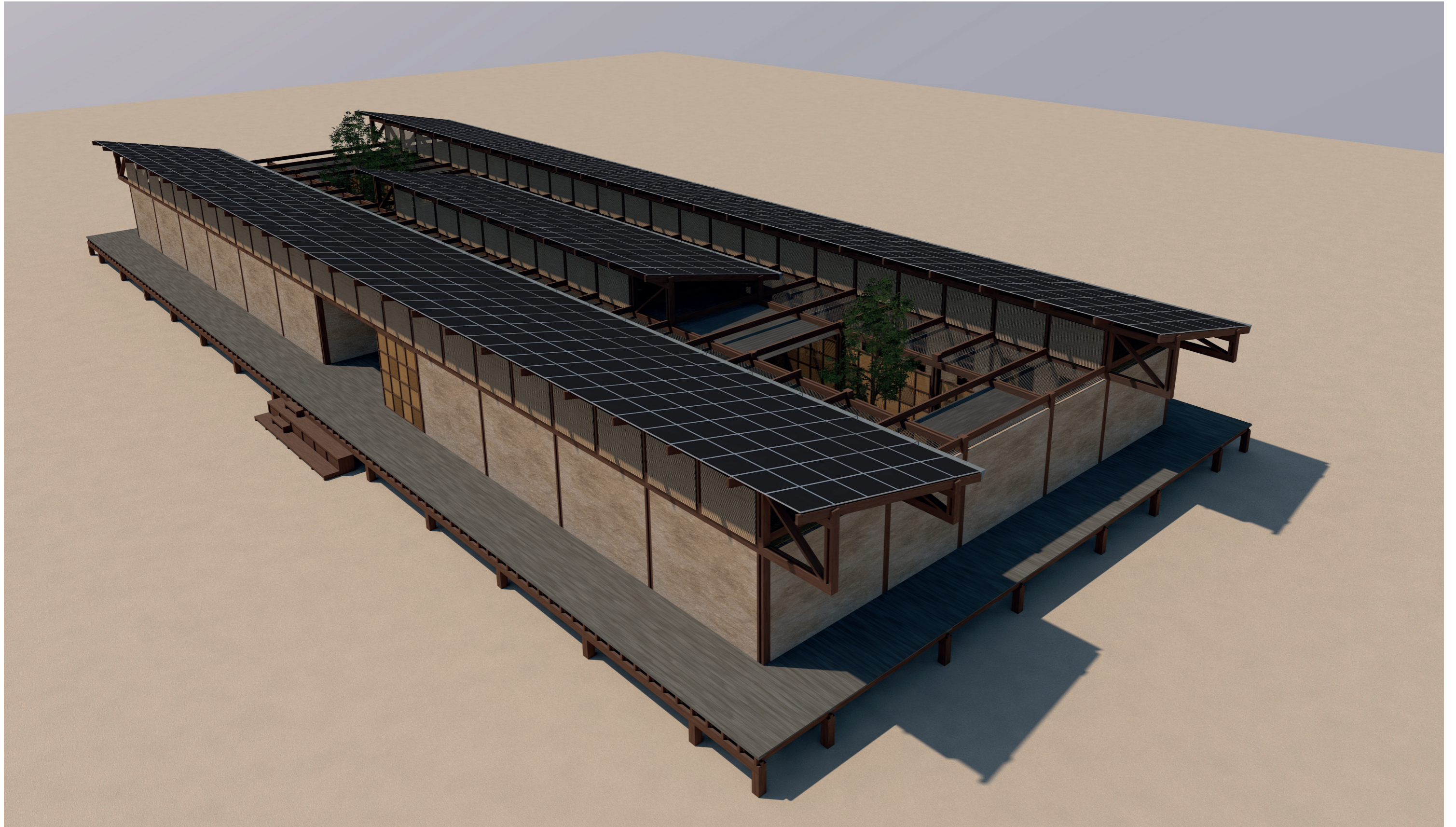


passive building



# design

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# clear routing

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clear routing



local materials



local craftsman



passive building

# clear routing

open to the inside, closed on the outside



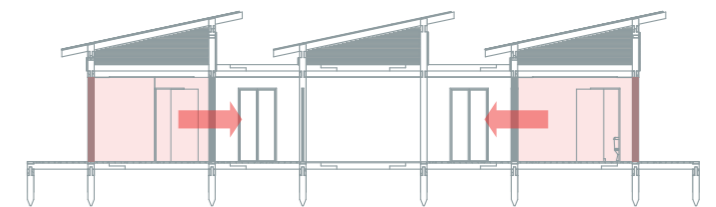
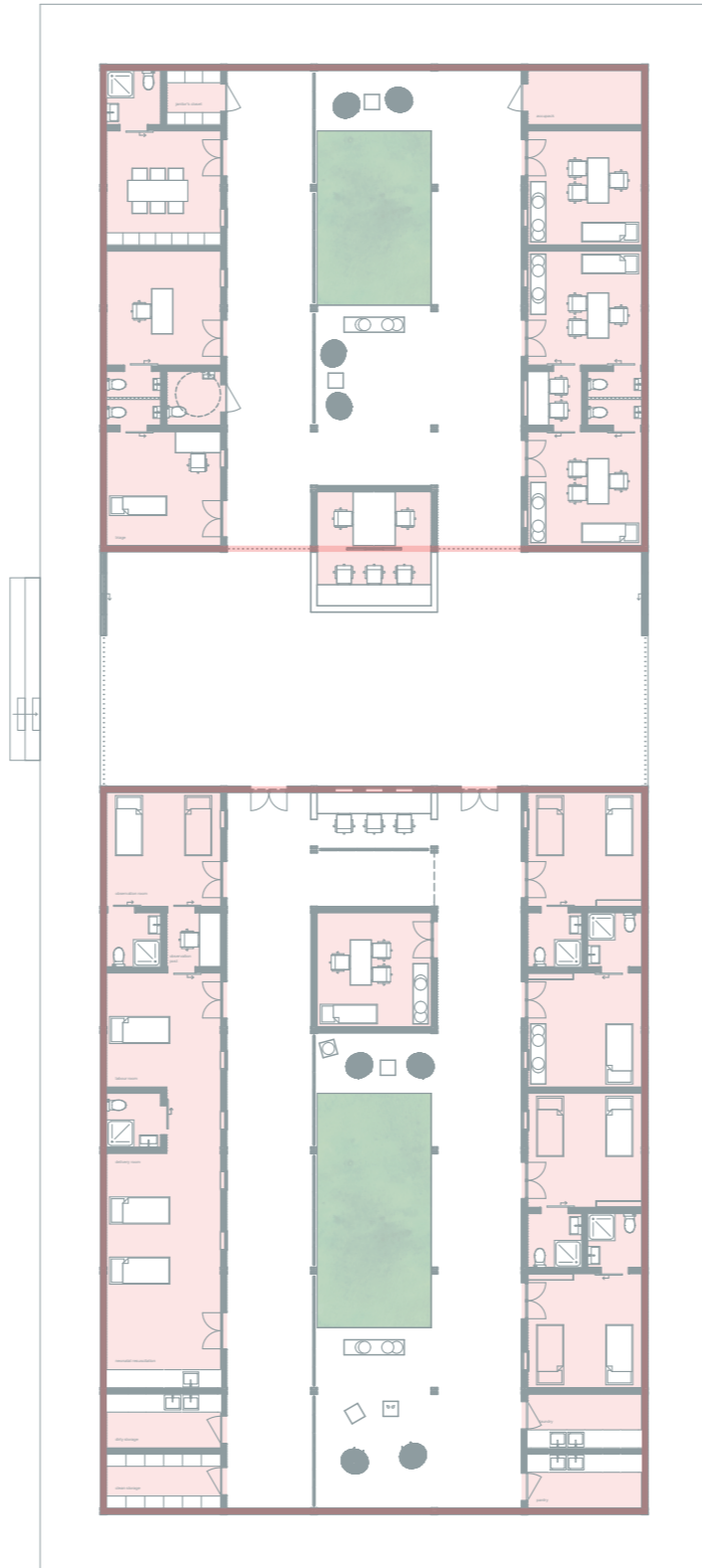
security



outdoor is indoor

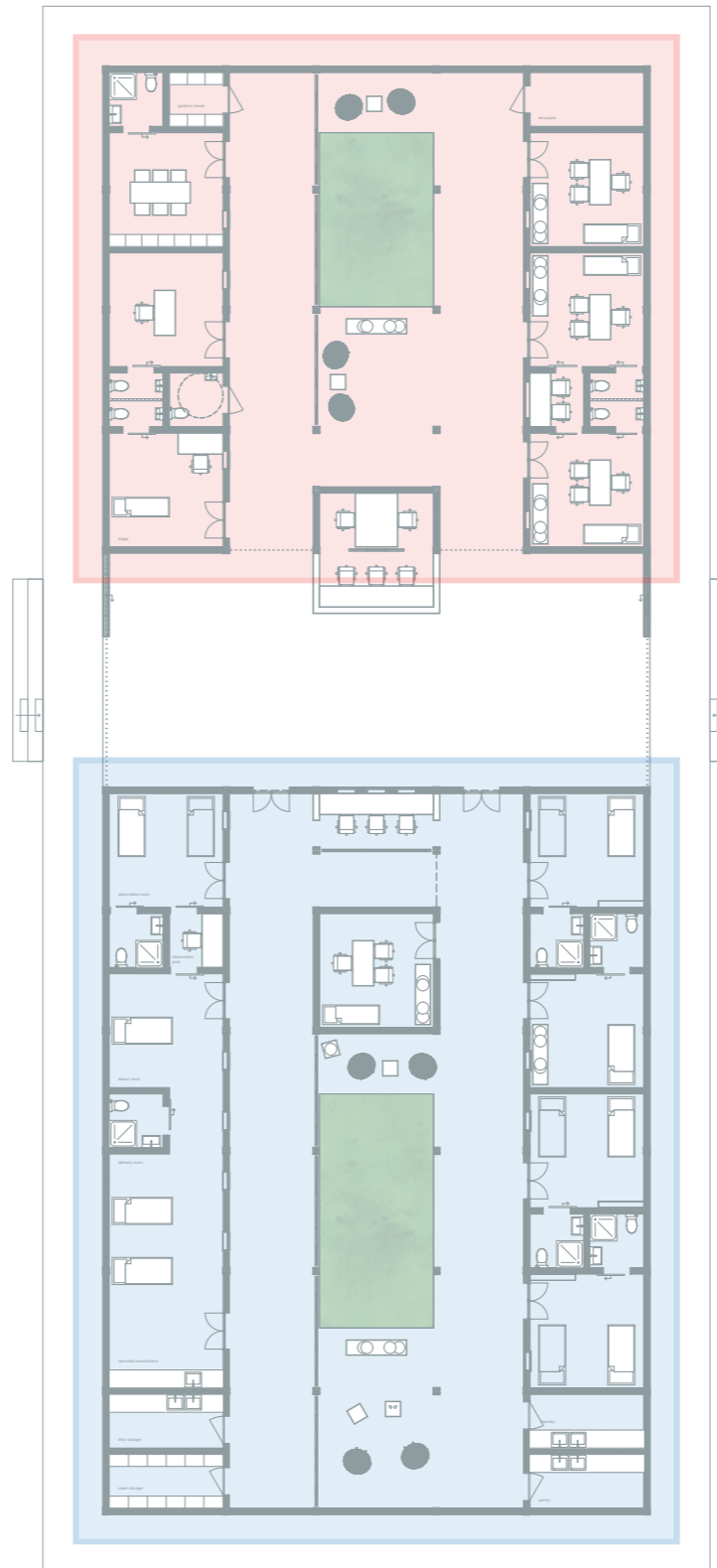
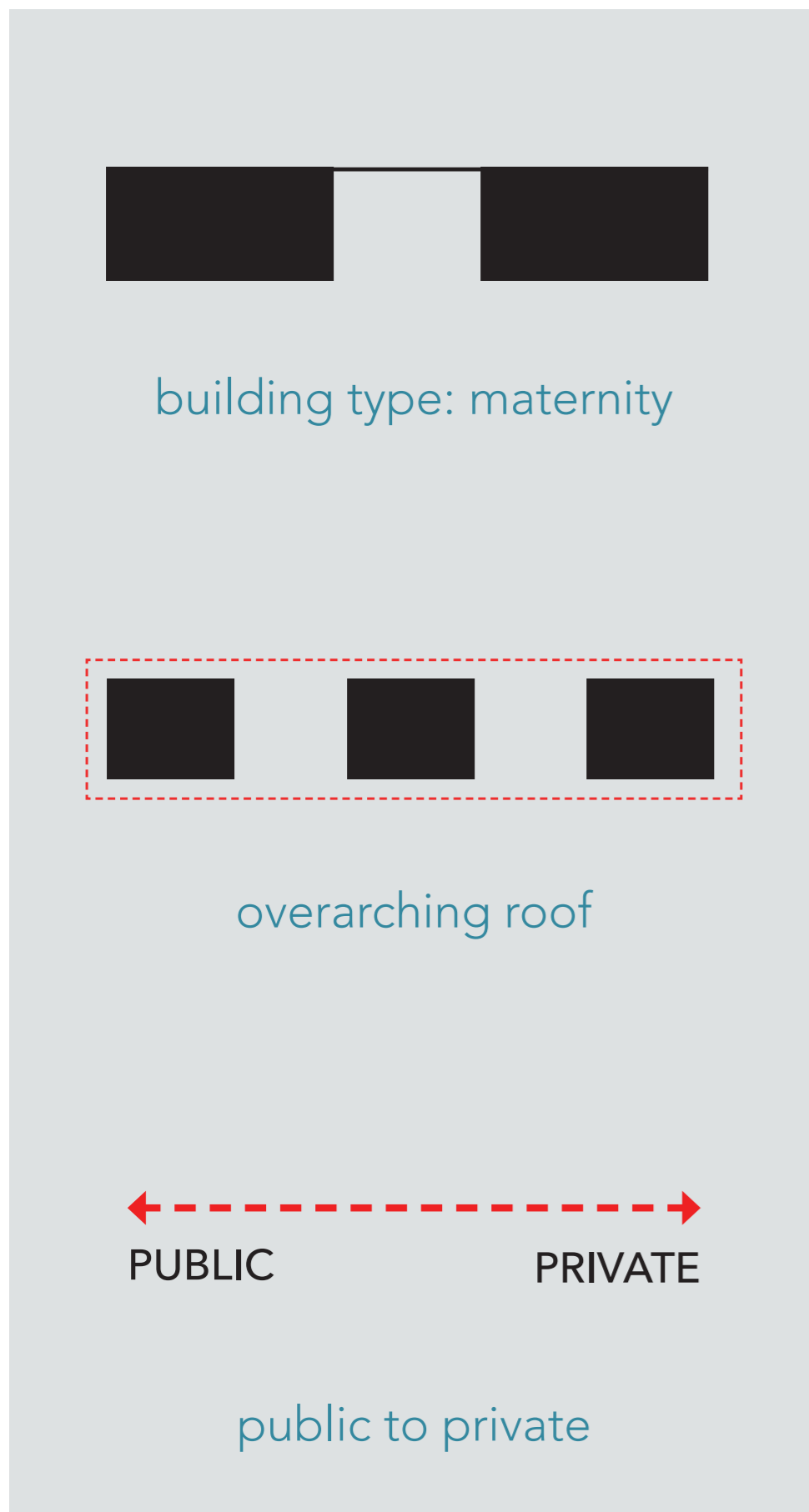


natural daylight  
green environment



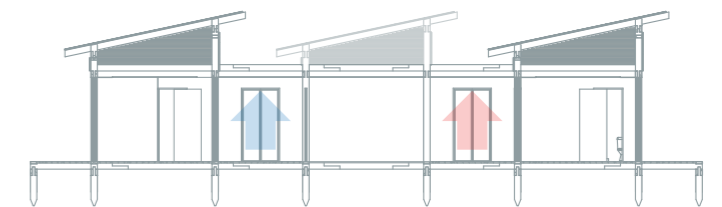
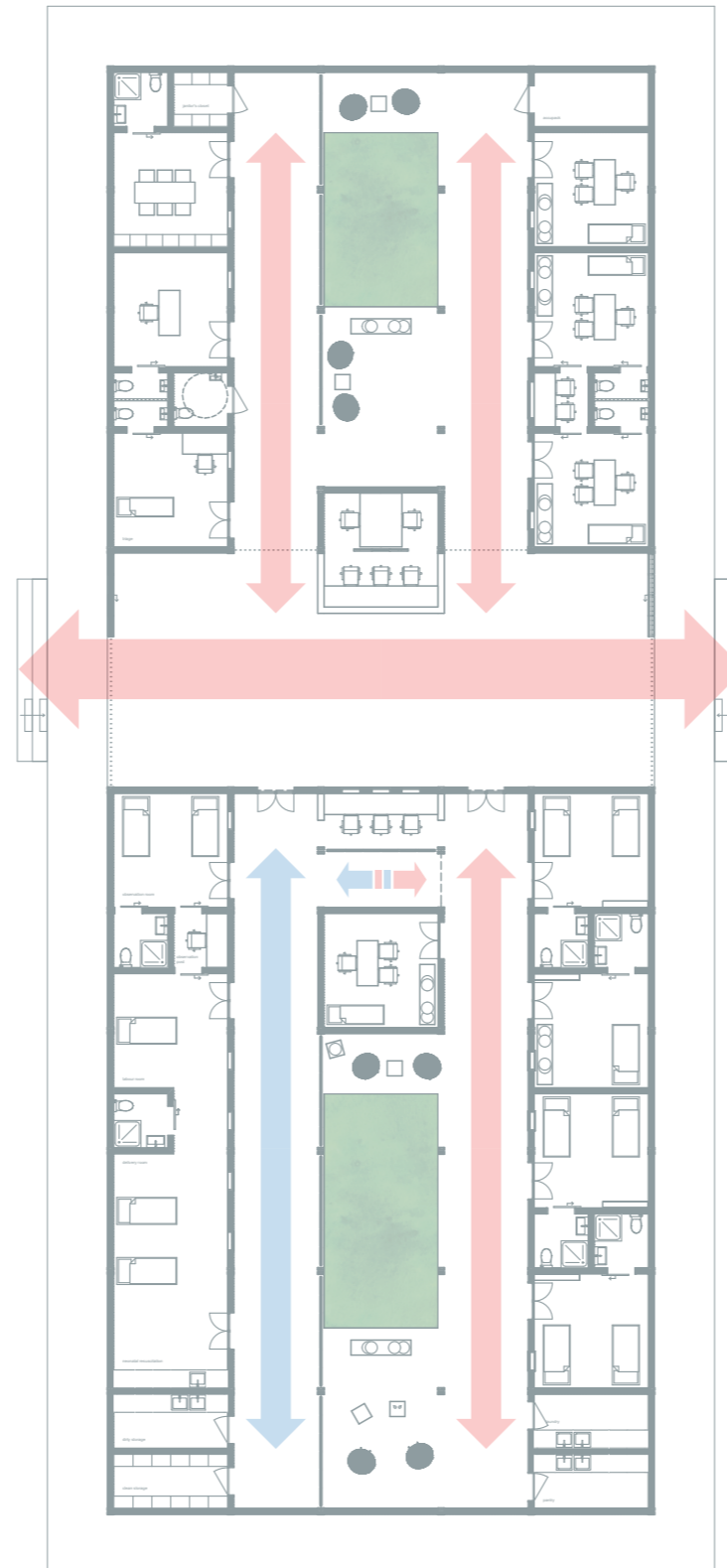
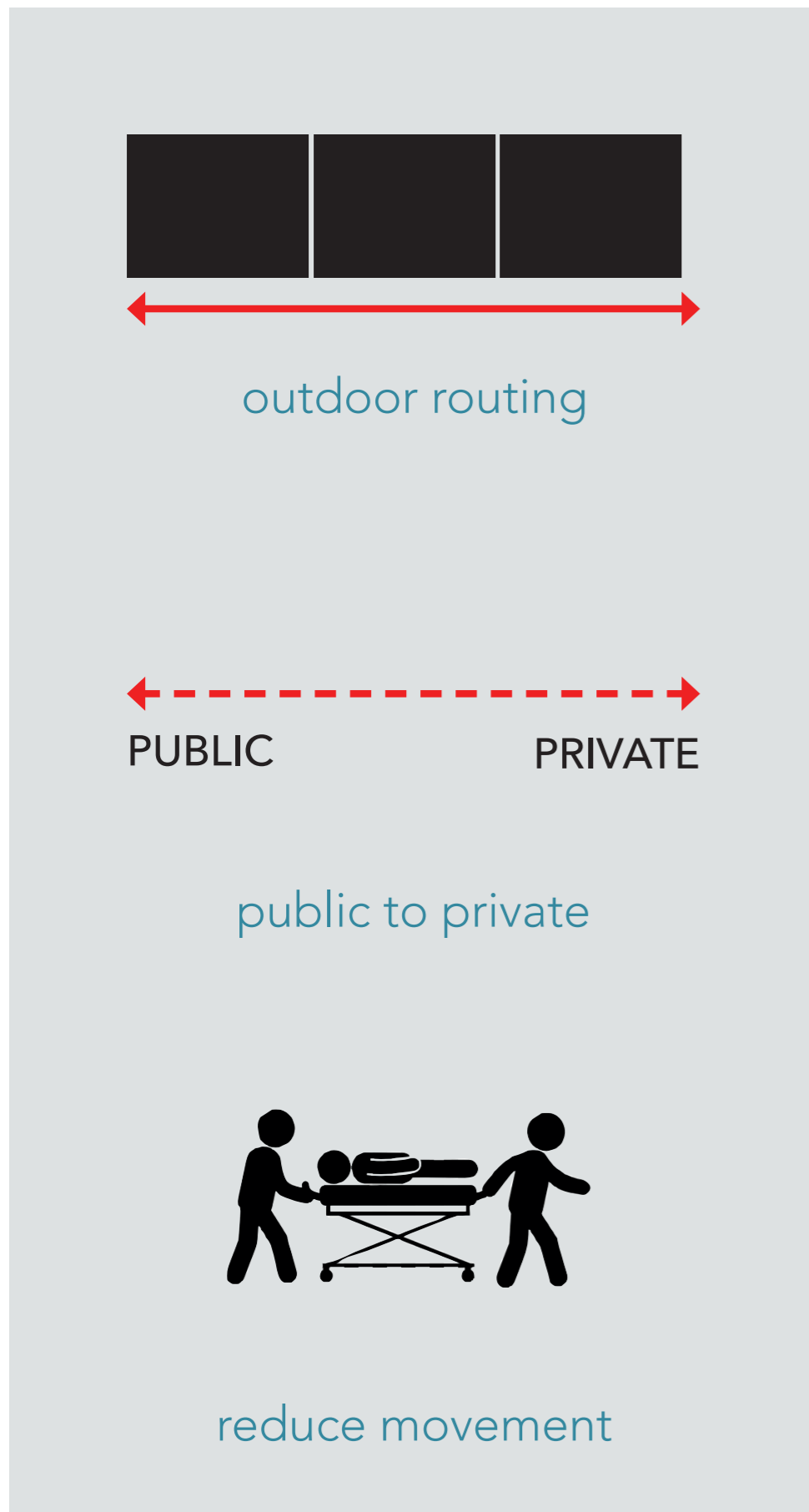
# clear routing

division inpatient area and outpatient area



# clear routing

main transport axes



# clear routing

communal spaces



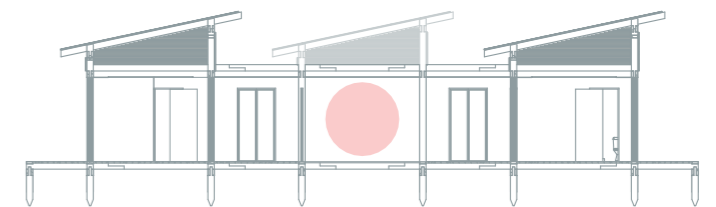
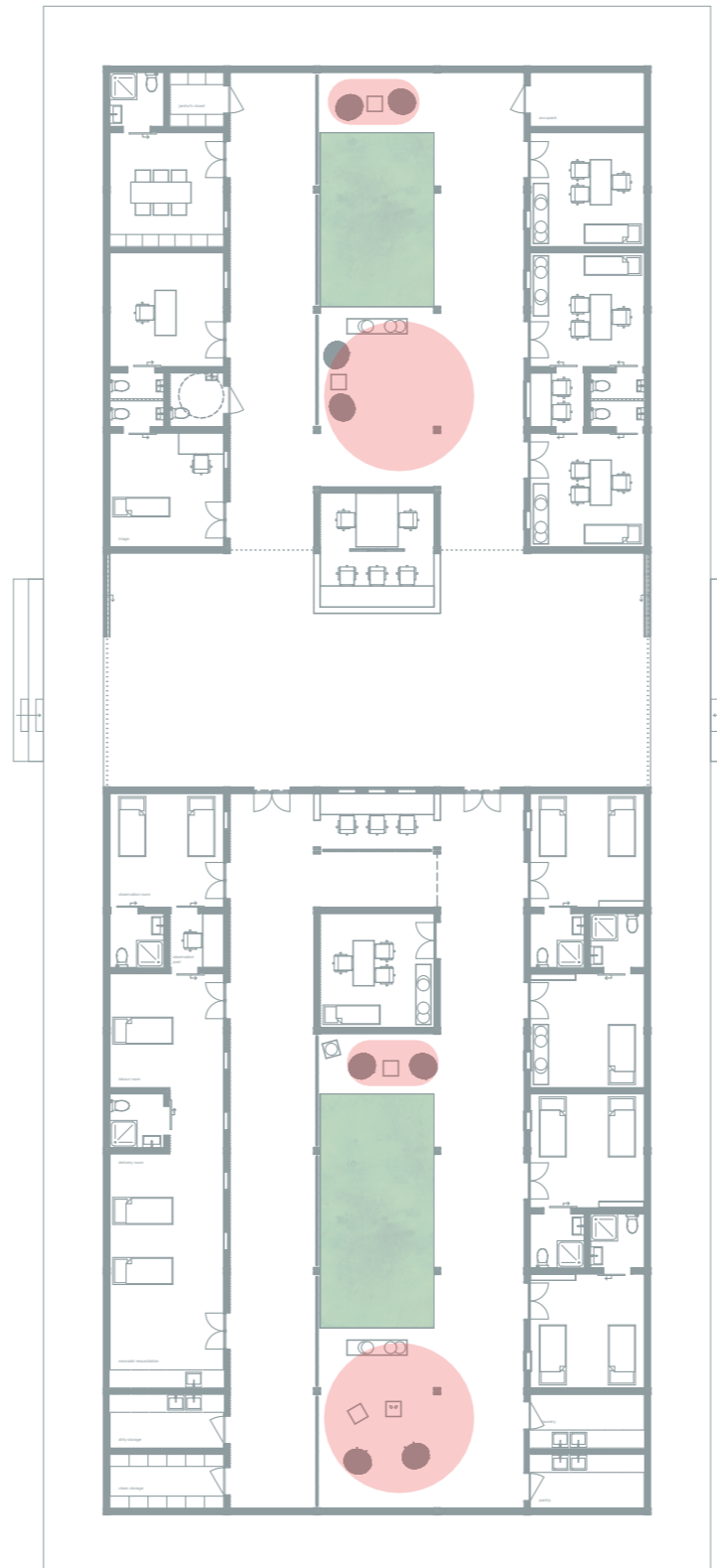
natural daylight  
green environment



outdoor is indoor

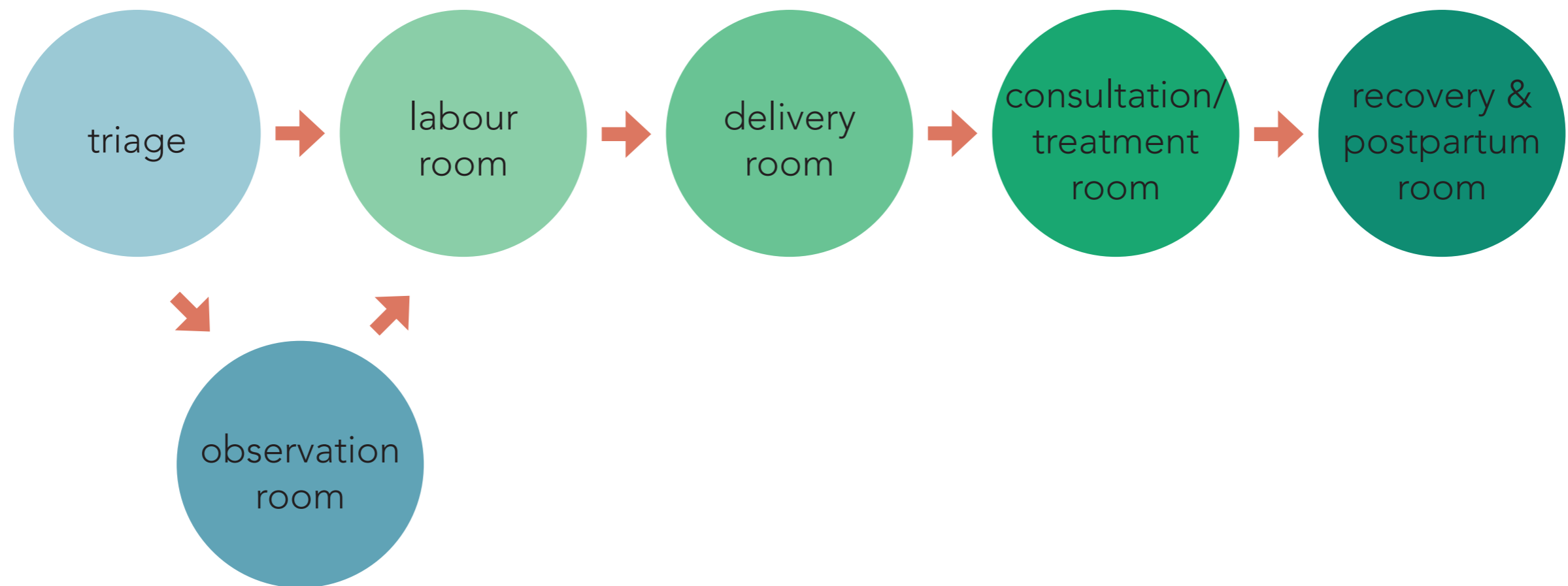


human scale and a familiar  
environment



# clear routing

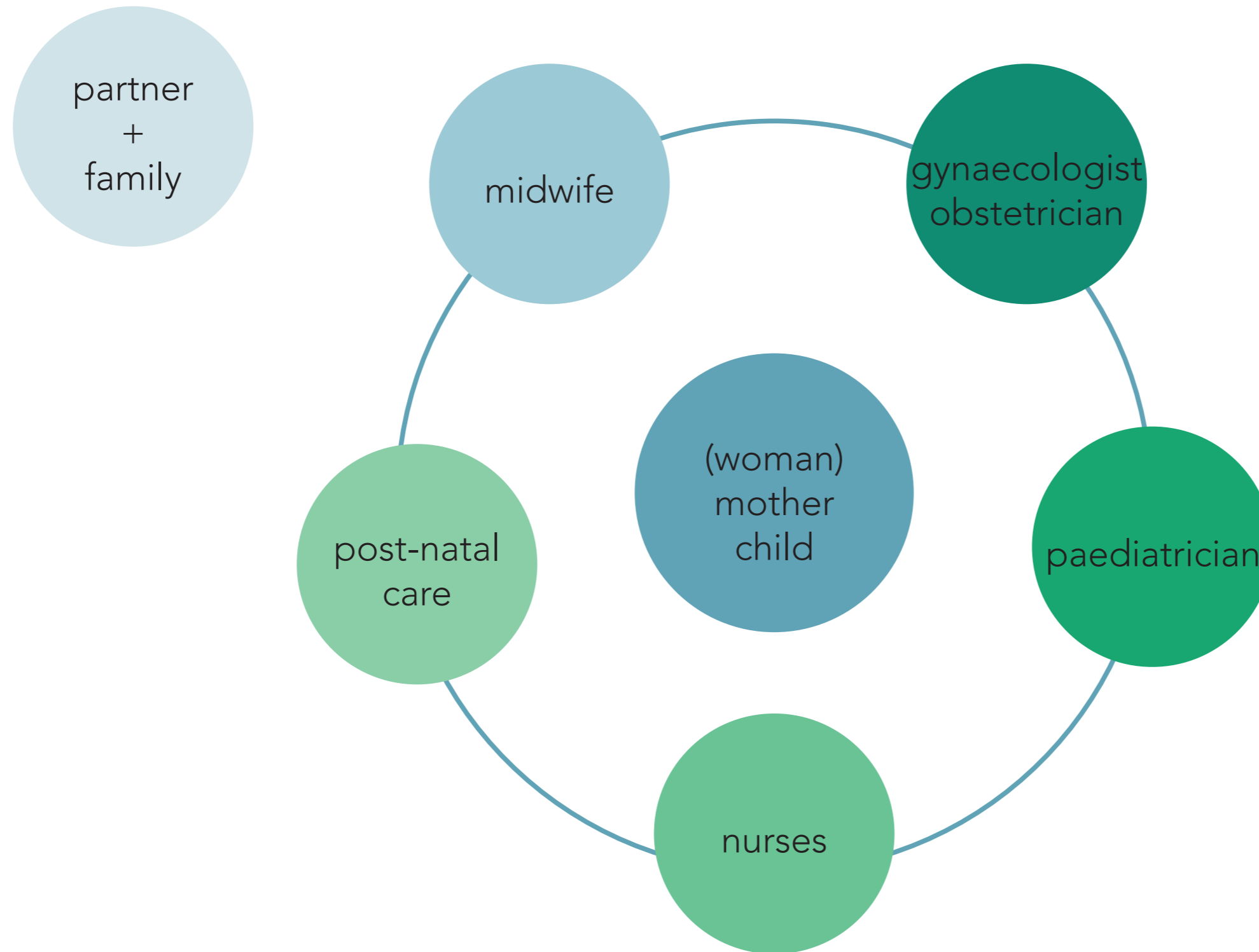
classic Central African maternity workflow





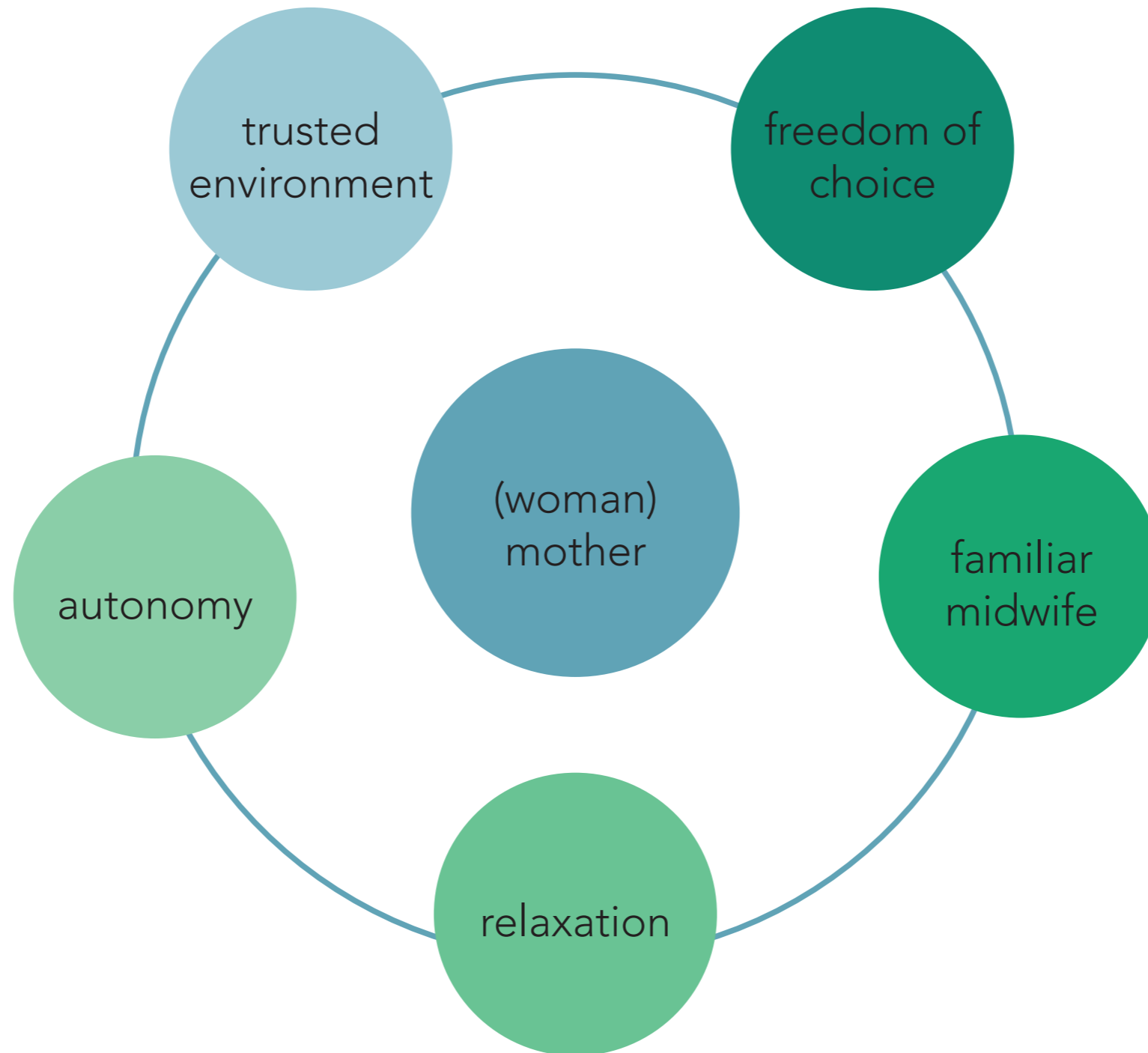
# clear routing

Dutch maternity system



# clear routing

feeling at home





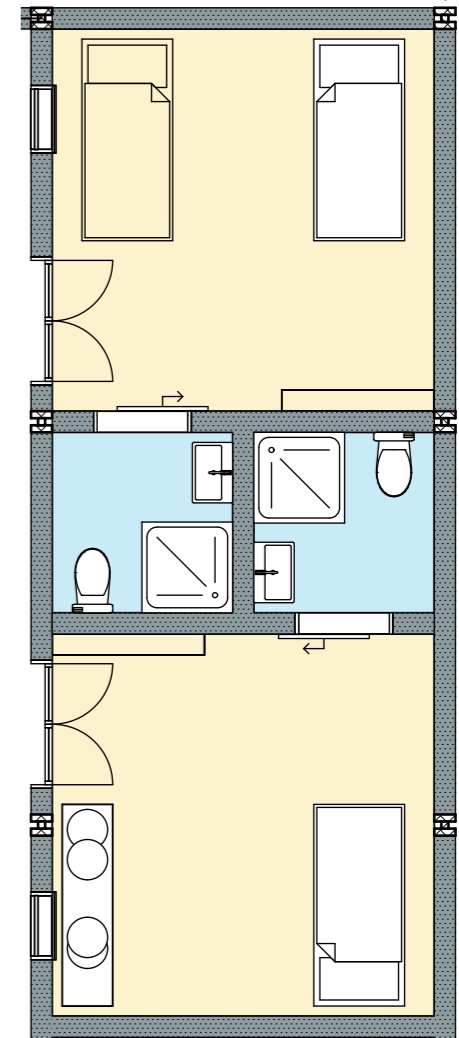
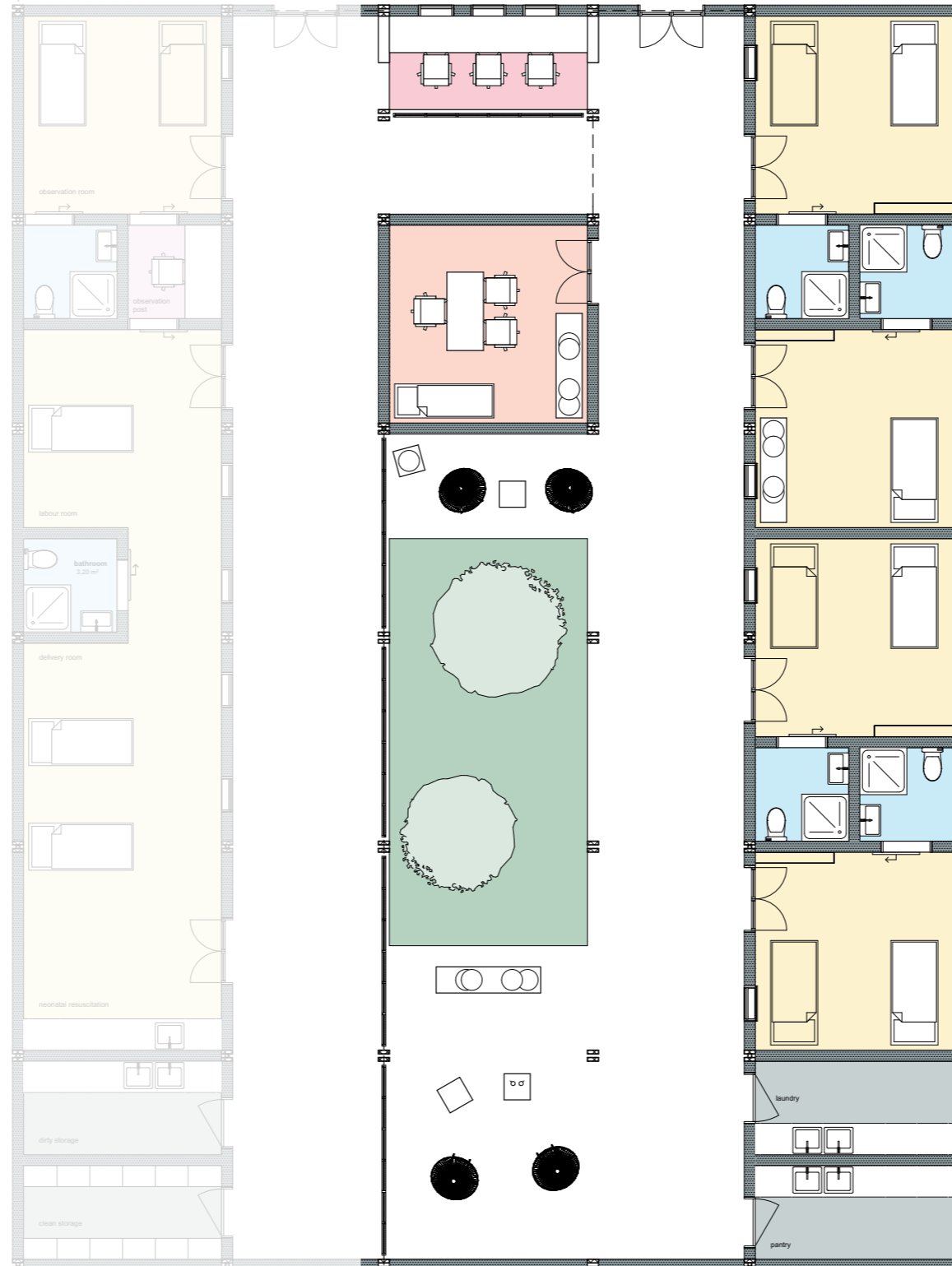
# clear routing

workflow / internal routing medical area



# clear routing

1-2 bed rooms



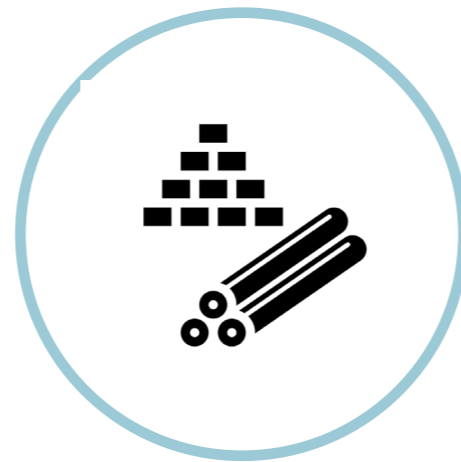


# local & circular

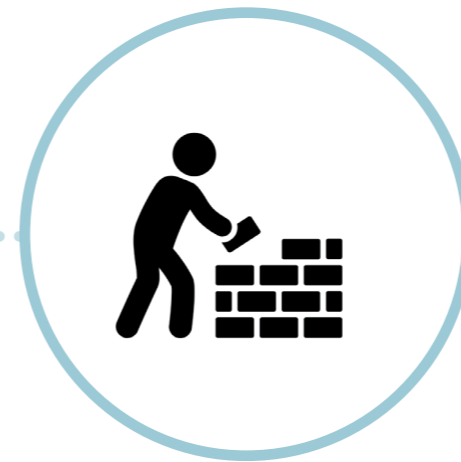
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clear routing



local materials



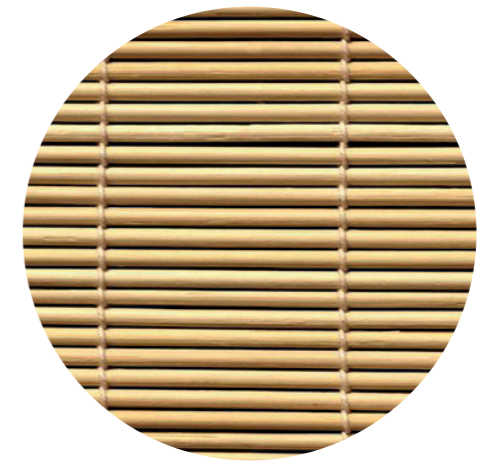
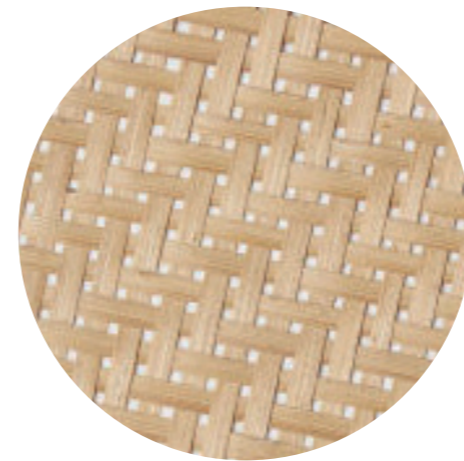
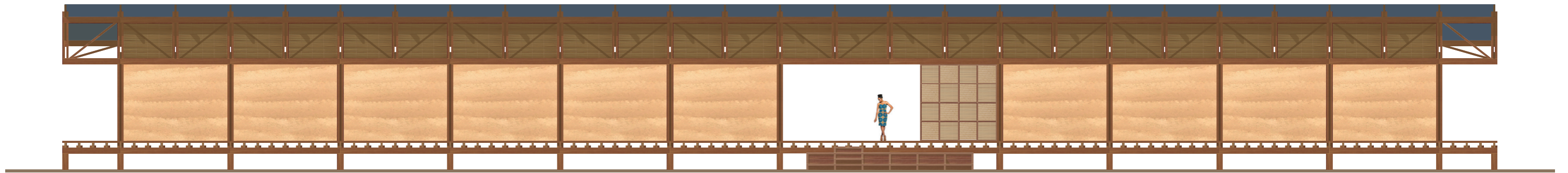
local craftsman



passive building

# local & circular

materials





# local & circular

timber





# local & circular

Timber species:	Botanical name:	timber											5 most common species
		Logs	Sawn w.	Veneer	Plywood	Constr.	Windows	Cladding	Decor.	Durability	Termites		
African Mahogany, Khaya	<i>Khaya Ivorensis, Anthotheca</i>		x					x		3	G		
Azobé	<i>Lophira Alata</i>	x	x			x				1	D	x	
Bossé	<i>Guarea Spp.</i>		x	x			x	x		2	G		
Cedar	<i>Cedrela Odorata</i>		x	x			x	x		2	M		
Danta, Kotibé	<i>Nesogordonia Spp.</i>		x	x		x	x			3	M		
Dibetou	<i>Lovoa Trichilioides</i>		x	x					x	3	G		
Fraké	<i>Terminalia Superba</i>		x	x				-	x	4	G	x	
Framiré	<i>Terminalia Ivorensis</i>		x		x		x			2	G		
Fromager	<i>Ceiba Pentandra</i>		x	x	x				x	5	G	x	
Ilomba	<i>Pycnanthus kombo</i>		x	x					x	5	G		
Iroko	<i>Milicia Excelsa, Milicia Regia</i>		x	x			x	x		1	D		
Kosipo	<i>Entandrophragma Candollei</i>		x	x					x	2	M		
Koto	<i>Pterygota Macrocarpa</i>		x	x					x	5	G		
Lingué, Afzelia	<i>Afzelia Africana</i>	x	x			x	x	x		1	D		
Makoré	<i>Tieghemella Heckelii</i>		x	x				x	x	1	D		
Mansonina, Beté	<i>Mansonina Altissima</i>		x	x					x	1	D		
Niangon	<i>Heritiera spp.</i>		x		x		x		x	3	M		
Samba, Ayous	<i>Triplochiton Scleroxylon</i>		x	x					x	5	G	x	
Teak	<i>Tectona Grandis</i>		x	x	x		x		x	1	M	x	
Tiama	<i>Entandrophragma Angolense</i>		x	x					x	3	G		



# local & circular

		timber										5 most common species
Timber species:	Botanical name:	Logs	Sawn w.	Veneer	Plywood	Constr.	Windows	Cladding	Decor.	Durability	Termites	
African Mahogany, Khaya	<i>Khaya Ivorensis, Anthotheca</i>		x					x		3	G	
Azobé	<i>Lophira Alata</i>	x	x			x				1	D	x
Bossé	<i>Guarea Spp.</i>		x	x			x	x		2	G	
Cedar	<i>Cedrela Odorata</i>		x	x			x	x		2	M	
Danta, Kotibé	<i>Nesogordonia Spp.</i>		x	x		x	x			3	M	
Dibetou	<i>Lovoa Trichilioides</i>		x	x					x	3	G	
Fraké	<i>Terminalia Superba</i>		x	x				-	x	4	G	x
Framiré	<i>Terminalia Ivorensis</i>		x		x		x			2	G	
Fromager	<i>Ceiba Pentandra</i>		x	x	x				x	5	G	x
Ilomba	<i>Pycnanthus kombo</i>		x	x					x	5	G	
Iroko	<i>Milicia Excelsa, Milicia Regia</i>		x	x			x	x		1	D	
Kosipo	<i>Entandrophragma Candollei</i>		x	x					x	2	M	
Koto	<i>Pterygota Macrocarpa</i>		x	x					x	5	G	
Lingué, Afzelia	<i>Afzelia Africana</i>	x	x			x	x	x		1	D	
Makoré	<i>Tieghemella Heckelii</i>		x	x				x	x	1	D	
Mansonie, Beté	<i>Mansonie Altissima</i>		x	x					x	1	D	
Niangon	<i>Heritiera spp.</i>		x		x		x		x	3	M	
Samba, Ayous	<i>Triplochiton Scleroxylon</i>		x	x					x	5	G	x
Teak	<i>Tectona Grandis</i>		x	x	x		x		x	1	M	x
Tiama	<i>Entandrophragma Angolense</i>		x	x					x	3	G	

# local & circular

Timber species:	Botanical name:	timber											5 most common species
		Logs	Sawn w.	Veneer	Plywood	Constr.	Windows	Cladding	Decor.	Durability	Termites		
African Mahogany, Khaya	<i>Khaya Ivorensis, Anthotheca</i>		x					x		3	G		
<b>Azobé</b>	<b><i>Lophira Alata</i></b>	x	x			x				1	D	x	
Bossé	<i>Guarea Spp.</i>		x	x				x	x	2	G		
Cedar	<i>Cedrela Odorata</i>		x	x				x	x	2	M		
<b>Danta, Kotibé</b>	<b><i>Nesogordonia Spp.</i></b>		x	x		x	x			3	M		
Dibetou	<i>Lovoa Trichilioides</i>		x	x					x	3	G		
Fraké	<i>Terminalia Superba</i>		x	x					- x	4	G	x	
Framiré	<i>Terminalia Ivorensis</i>		x		x			x		2	G		
Fromager	<i>Ceiba Pentandra</i>		x	x	x				x	5	G	x	
Ilomba	<i>Pycnanthus kombo</i>		x	x					x	5	G		
Iroko	<i>Milicia Excelsa, Milicia Regia</i>		x	x				x	x	1	D		
Kosipo	<i>Entandrophragma Candollei</i>		x	x					x	2	M		
Koto	<i>Pterygota Macrocarpa</i>		x	x					x	5	G		
<b>Lingué, Afzelia</b>	<b><i>Afzelia Africana</i></b>	x	x			x	x	x		1	D		
Makoré	<i>Tieghemella Heckelii</i>		x	x					x x	1	D		
Mansonie, Beté	<i>Mansonie Altissima</i>		x	x					x	1	D		
Niangon	<i>Heritiera spp.</i>		x		x			x	x	3	M		
Samba, Ayous	<i>Triplochiton Scleroxylon</i>		x	x					x	5	G	x	
Teak	<i>Tectona Grandis</i>		x	x	x			x	x	1	M	x	
Tiama	<i>Entandrophragma Angolense</i>		x	x					x	3	G		



# local & circular

		timber											5 most common species	
Timber species:	Botanical name:	Logs	Sawn w.	Veneer	Plywood	Constr.	Windows	Cladding	Decor.	Durability	Termites			
African Mahogany, Khaya	<i>Khaya Ivorensis, Anthotheca</i>		x					x		3	G			
Azobé	<i>Lophira Alata</i>	x	x			x				1	D	x		
Bossé	<i>Guarea Spp.</i>		x	x			x	x		2	G			
Cedar	<i>Cedrela Odorata</i>		x	x			x	x		2	M			
Danta, Kotibé	<i>Nesogordonia Spp.</i>		x	x		x	x			3	M			
Dibetou	<i>Lovoa Trichilioides</i>		x	x					x	3	G			
Fraké	<i>Terminalia Superba</i>		x	x				-	x	4	G	x		
Framiré	<i>Terminalia Ivorensis</i>		x		x		x			2	G			
Fromager	<i>Ceiba Pentandra</i>		x	x	x				x	5	G	x		
Ilomba	<i>Pycnanthus kombo</i>		x	x					x	5	G			
Iroko	<i>Milicia Excelsa, Milicia Regia</i>		x	x			x	x		1	D			
Kosipo	<i>Entandrophragma Candollei</i>		x	x					x	2	M			
Koto	<i>Pterygota Macrocarpa</i>		x	x					x	5	G			
Lingué, Afzelia	<i>Afzelia Africana</i>	x	x			x	x	x		1	D			
Makoré	<i>Tieghemella Heckelii</i>		x	x				x	x	1	D			
Mansonia, Beté	<i>Mansonia Altissima</i>		x	x					x	1	D			
Niangon	<i>Heritiera spp.</i>		x		x		x		x	3	M			
Samba, Ayous	<i>Triplochiton Scleroxylon</i>		x	x					x	5	G	x		
Teak	<i>Tectona Grandis</i>		x	x	x		x		x	1	M	x		
Tiama	<i>Entandrophragma Angolense</i>		x	x					x	3	G			

# local & circular

timber

## Azobé

## Afzelia/Lingué

Applications:

beams, purlins, trusses, columns

beams, purlins, trusses, columns

Density:

940-1100 kg/m<sup>3</sup>

620-950 kg/m<sup>3</sup>

Process- and achinability:

Fastening:

pre-drillin is required

pre-drillin is required

Cutting:

can dull tools

can dull tools

Untreated wood:

colour will turn more gray

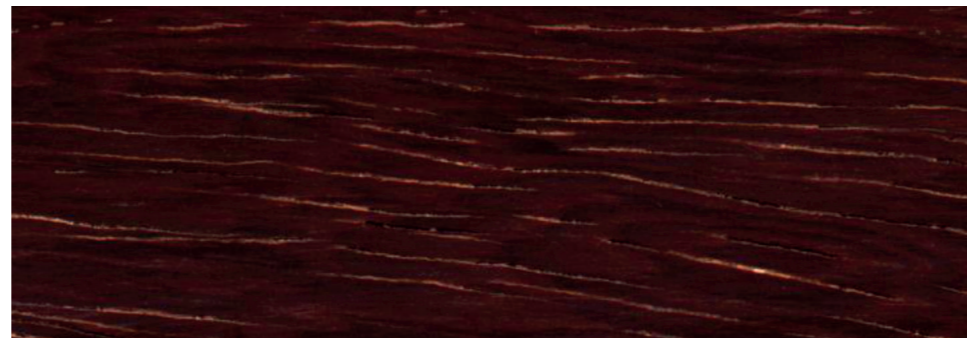
subject to decay

Others:

more common timber species

less durable in moist/wet  
circumstances

Appearance:





# local & circular

timber

## Azobé

- Pre-fabricated
- Assembled on site (local people)
- Combined beams & Columns  
Max. size: 70 mm x 210 mm x 4500 mm

Density: 940-1100 kg/m<sup>3</sup>

$0,21 \times 0,07 \times 4,5 = 0,06615 \text{ m}^3$

$0,06615 \times 1100 = 72 \text{ kg}$





# local & circular

rammed earth





# local & circular

rammed earth





# local & circular

rammed earth





# local & circular

rammed earth





# local & circular

rammed earth





# local & circular

rammed earth





# local & circular

rammed earth

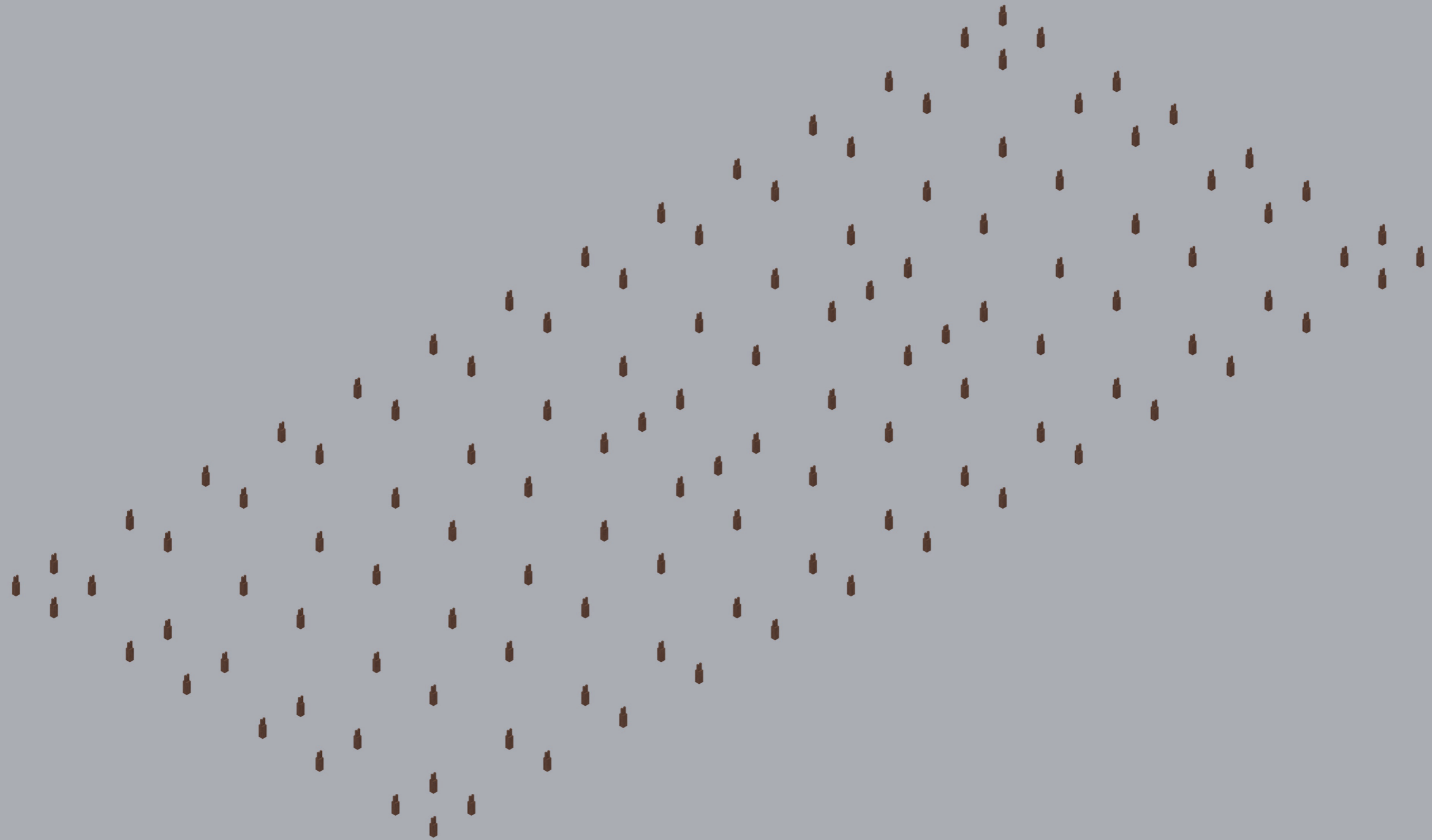




# local and circular

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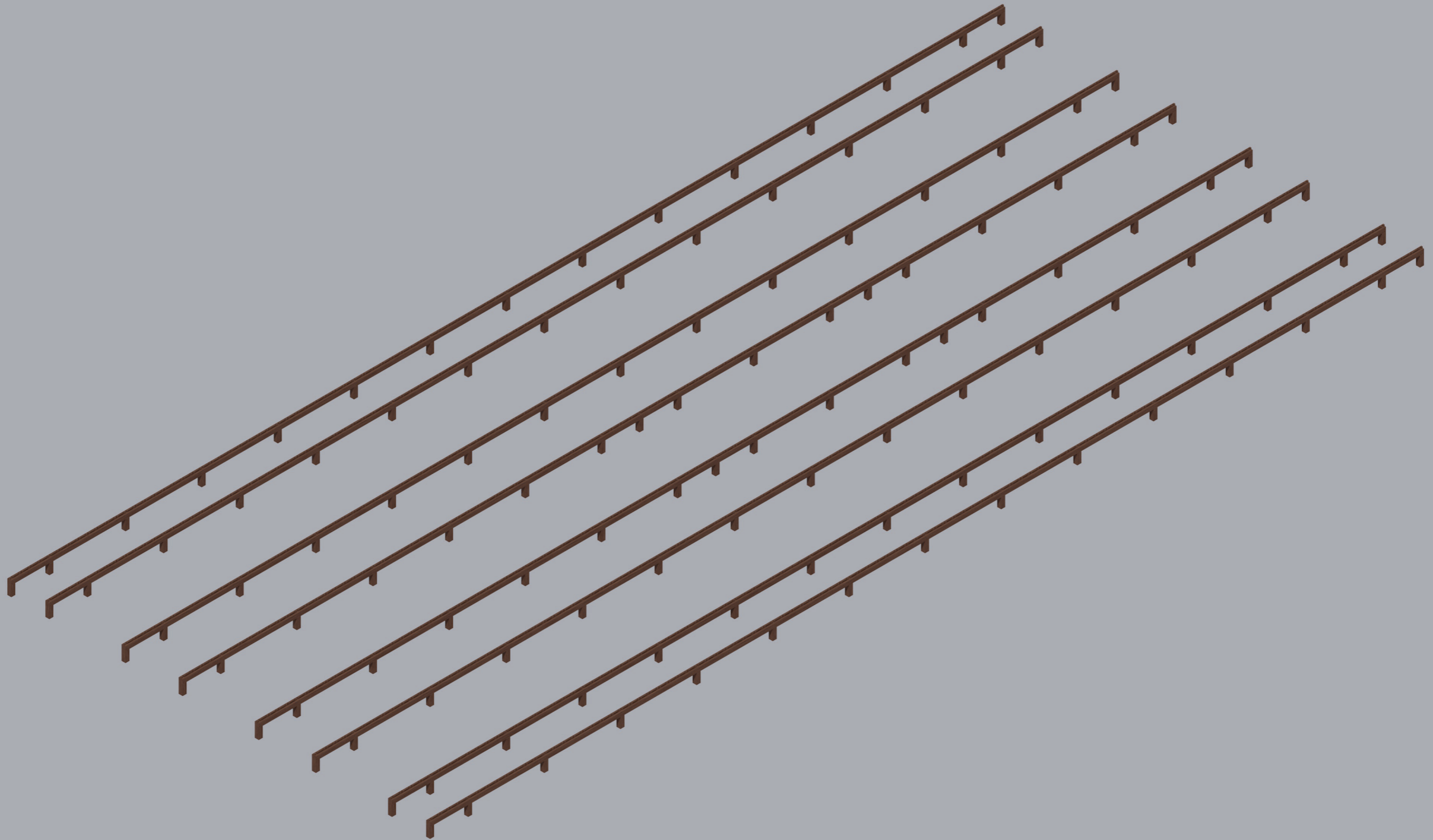
construction



# local and circular

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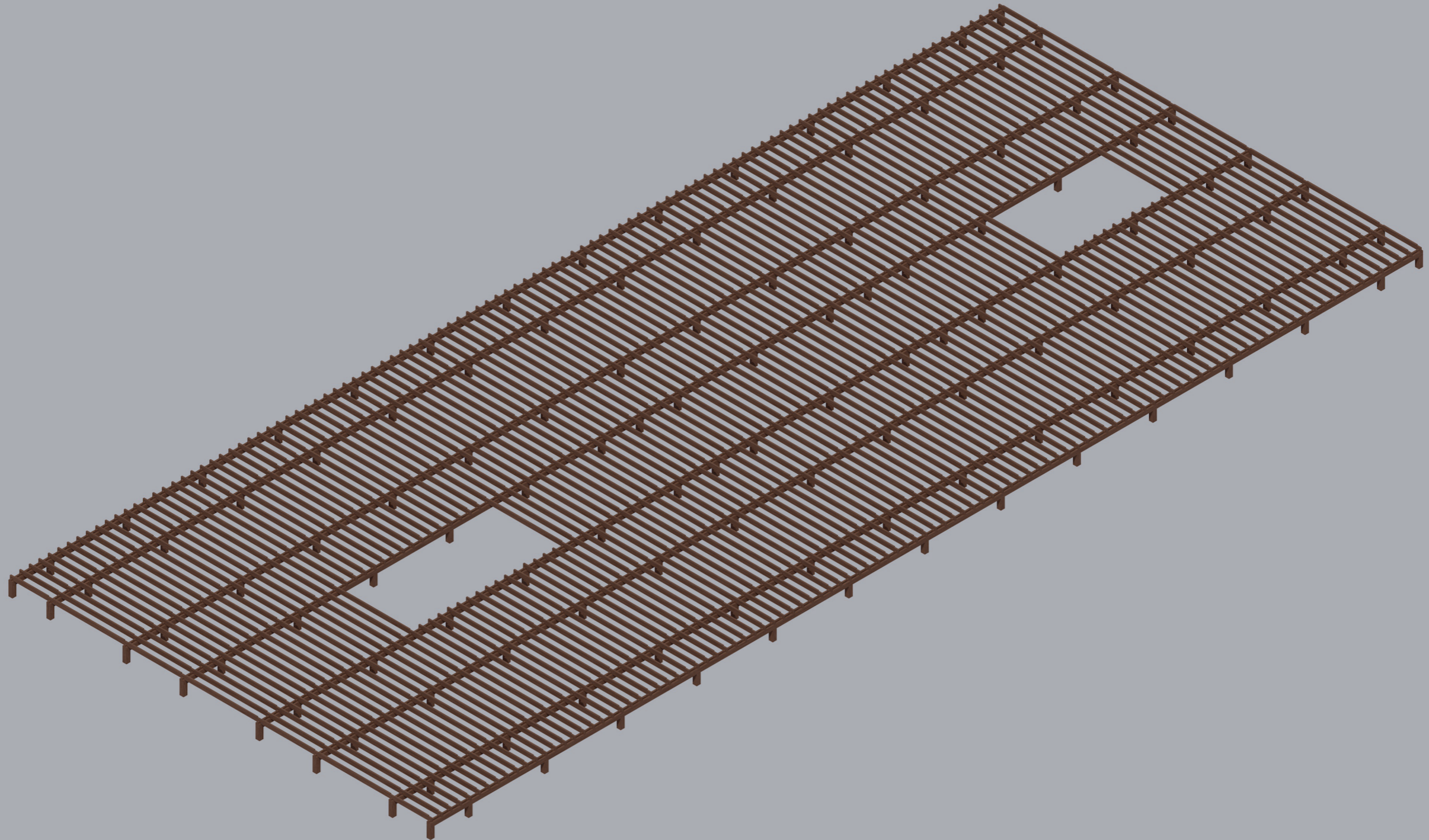
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# local and circular

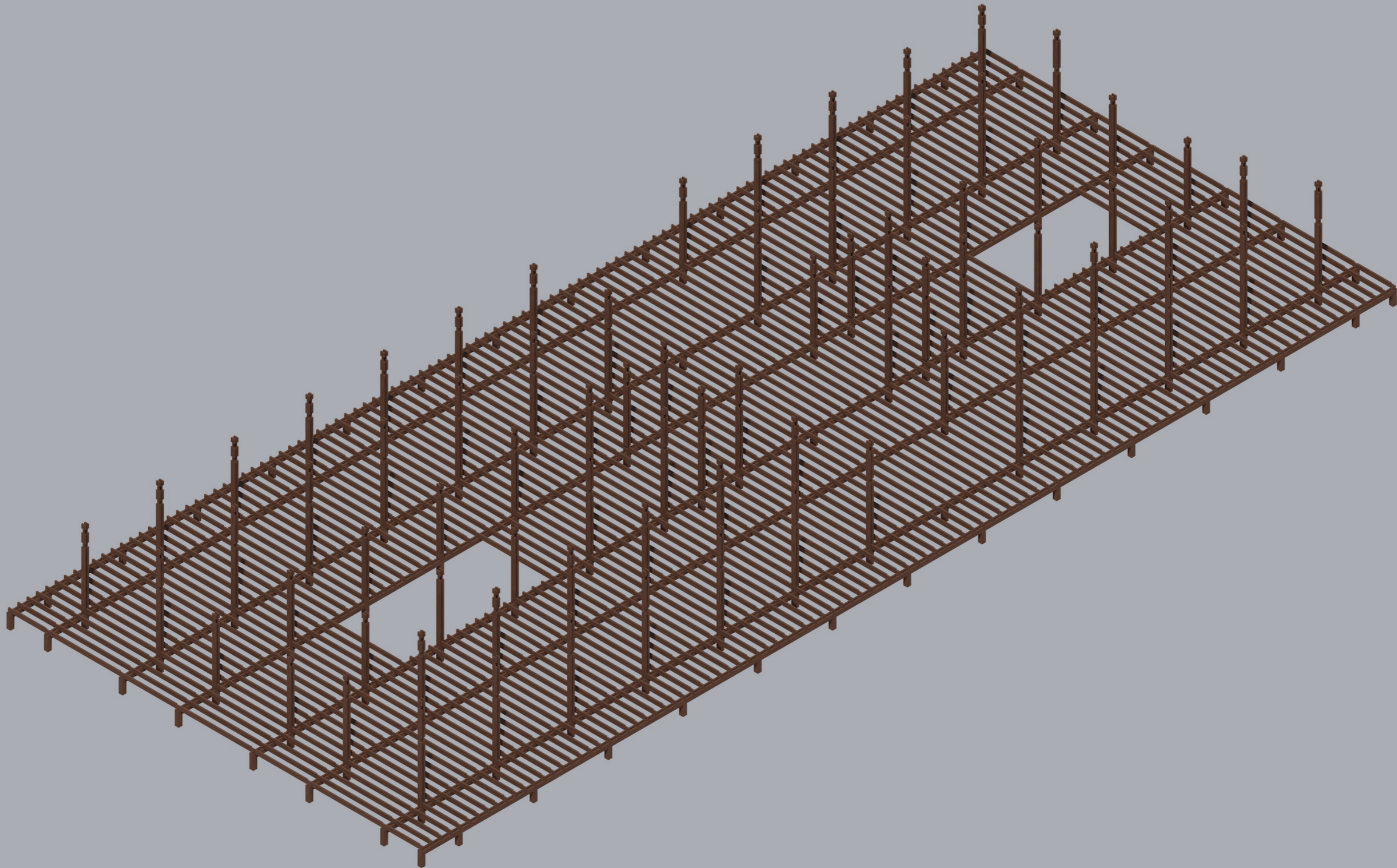
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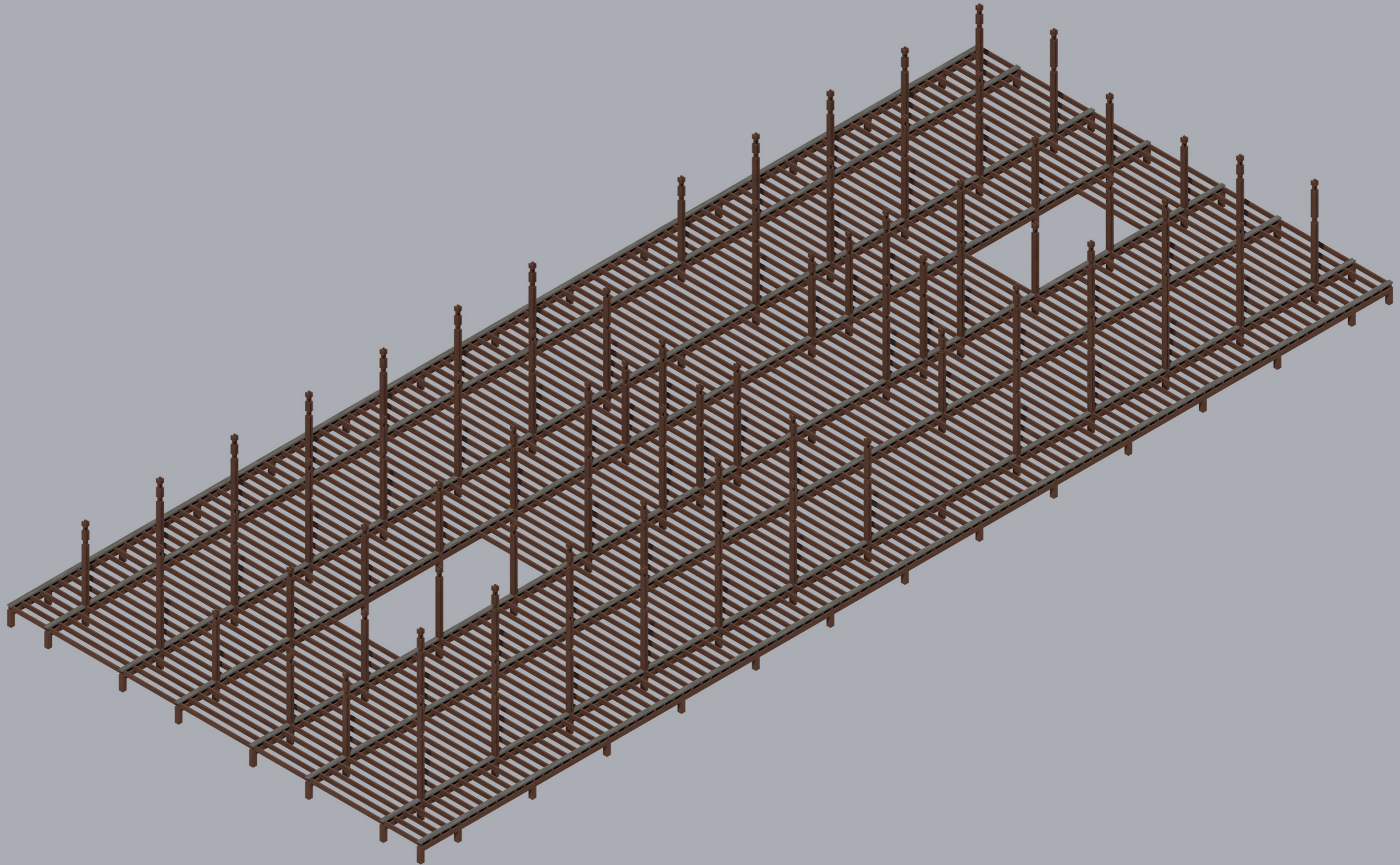
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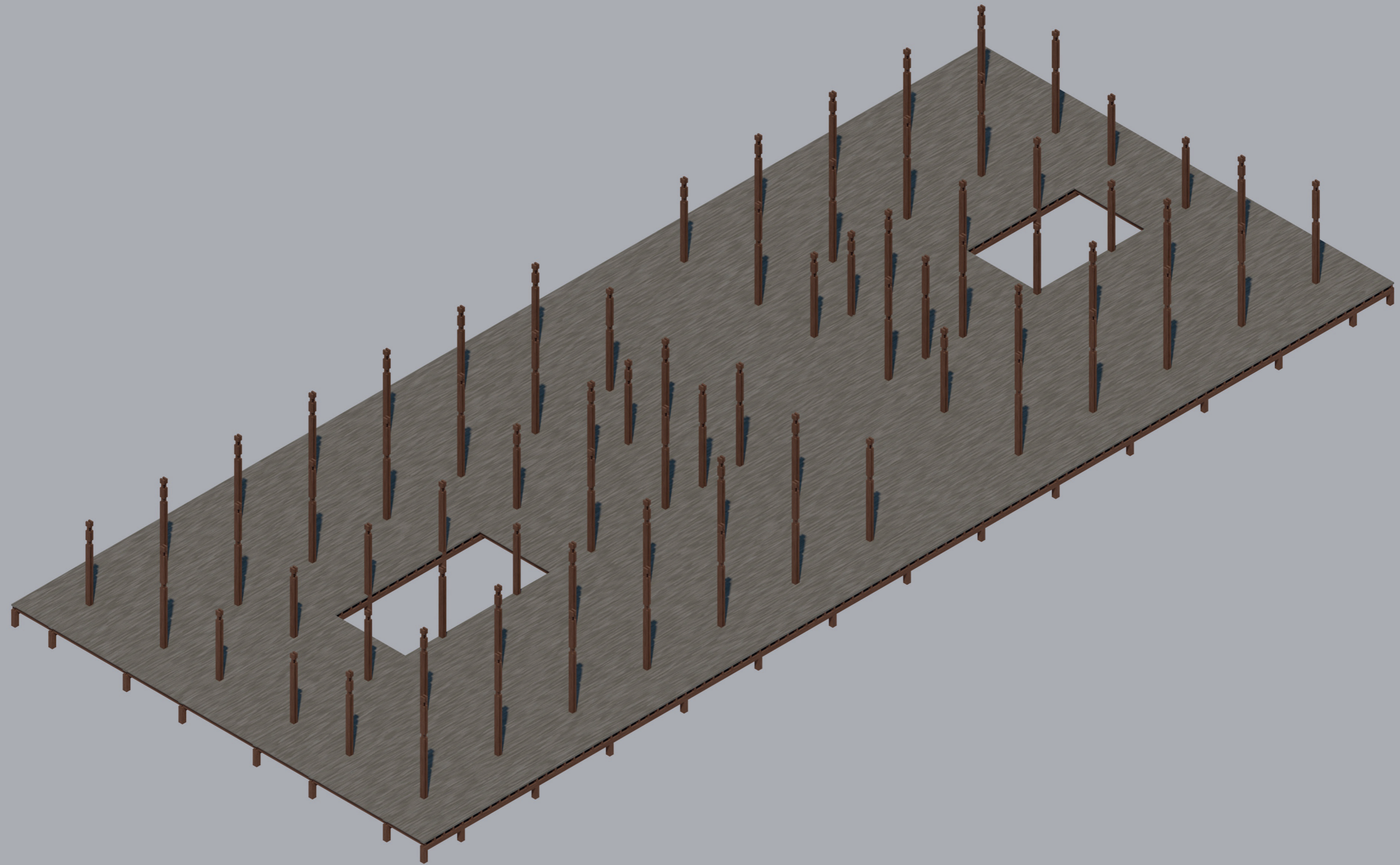
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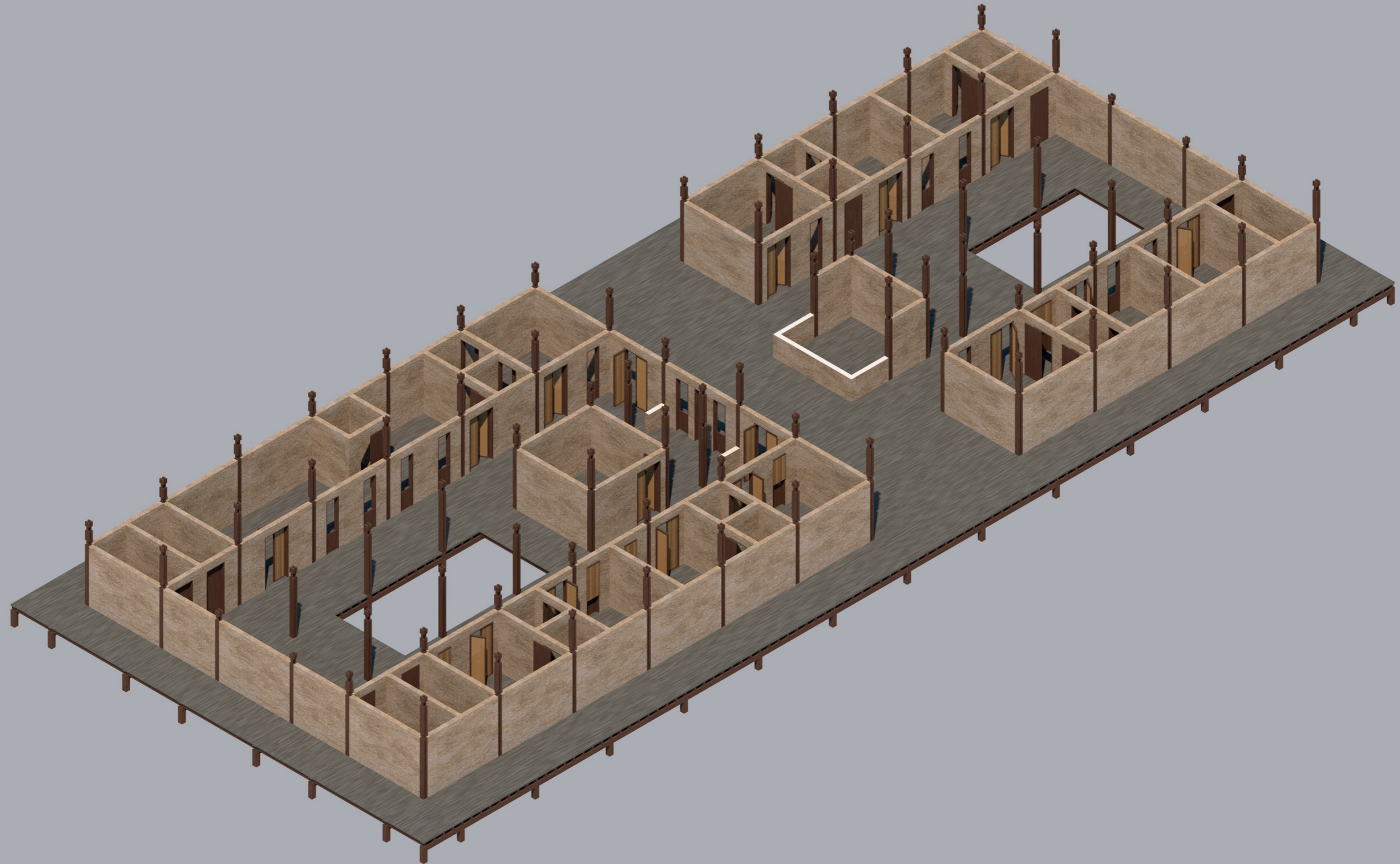
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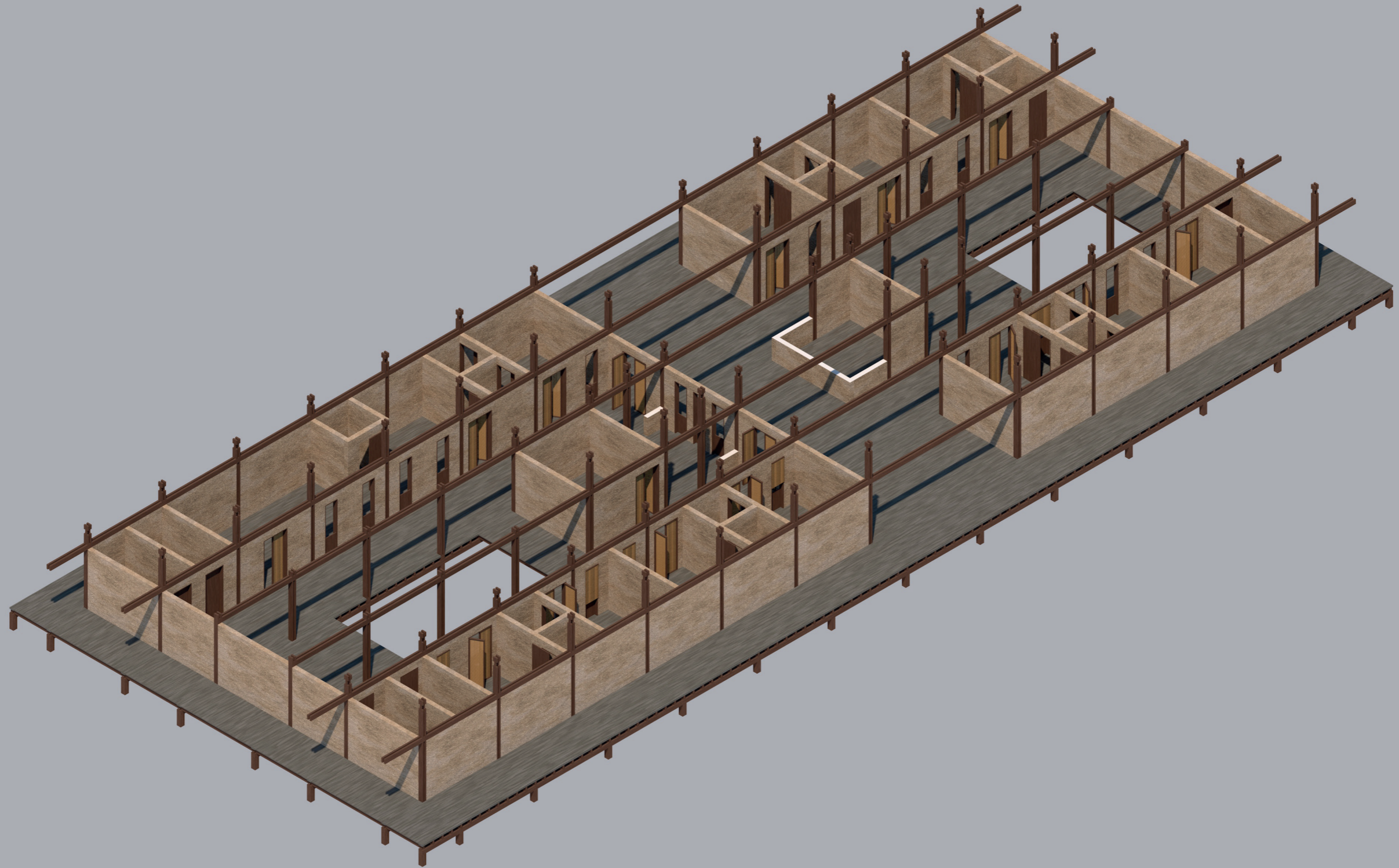
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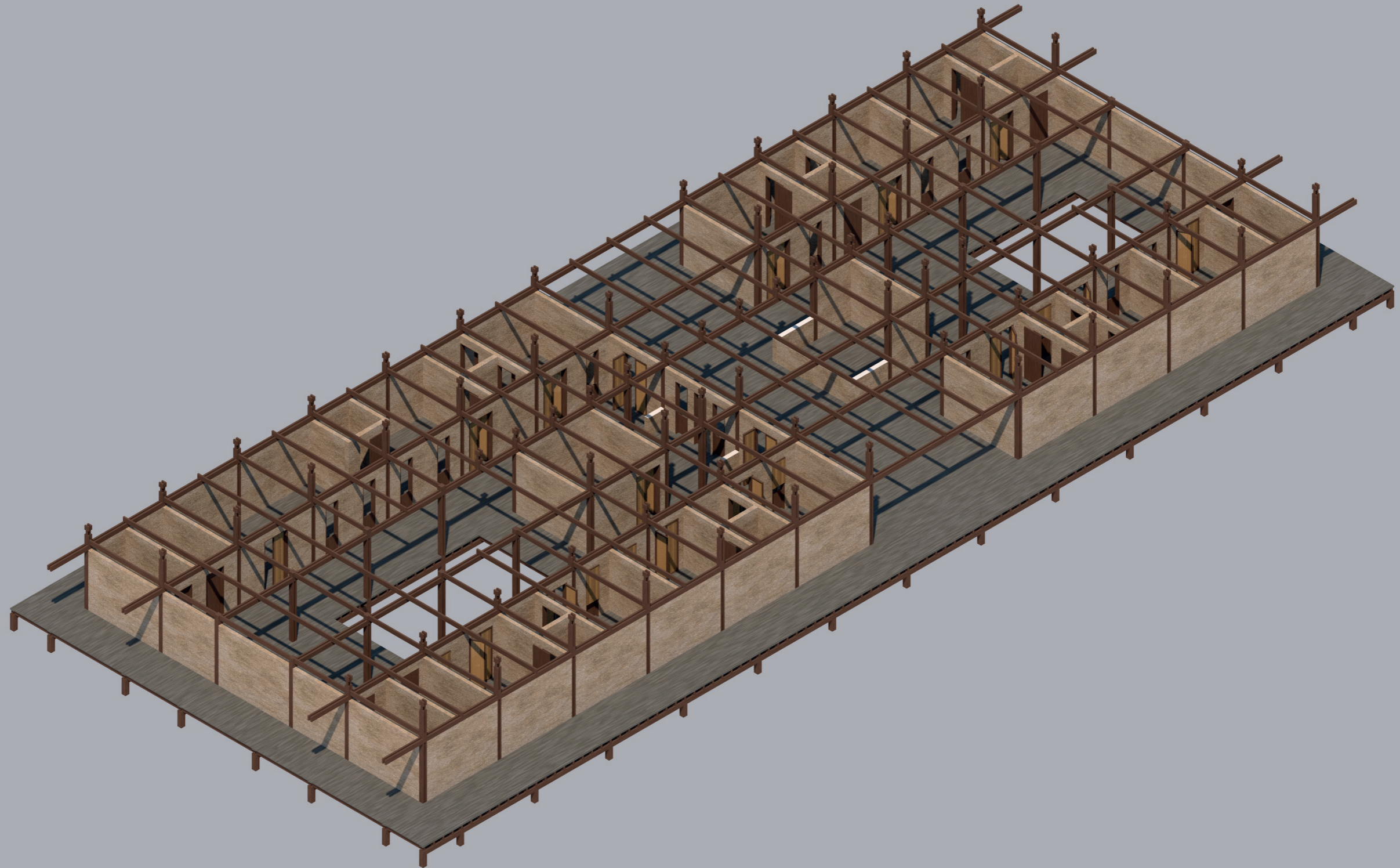
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# local and circular

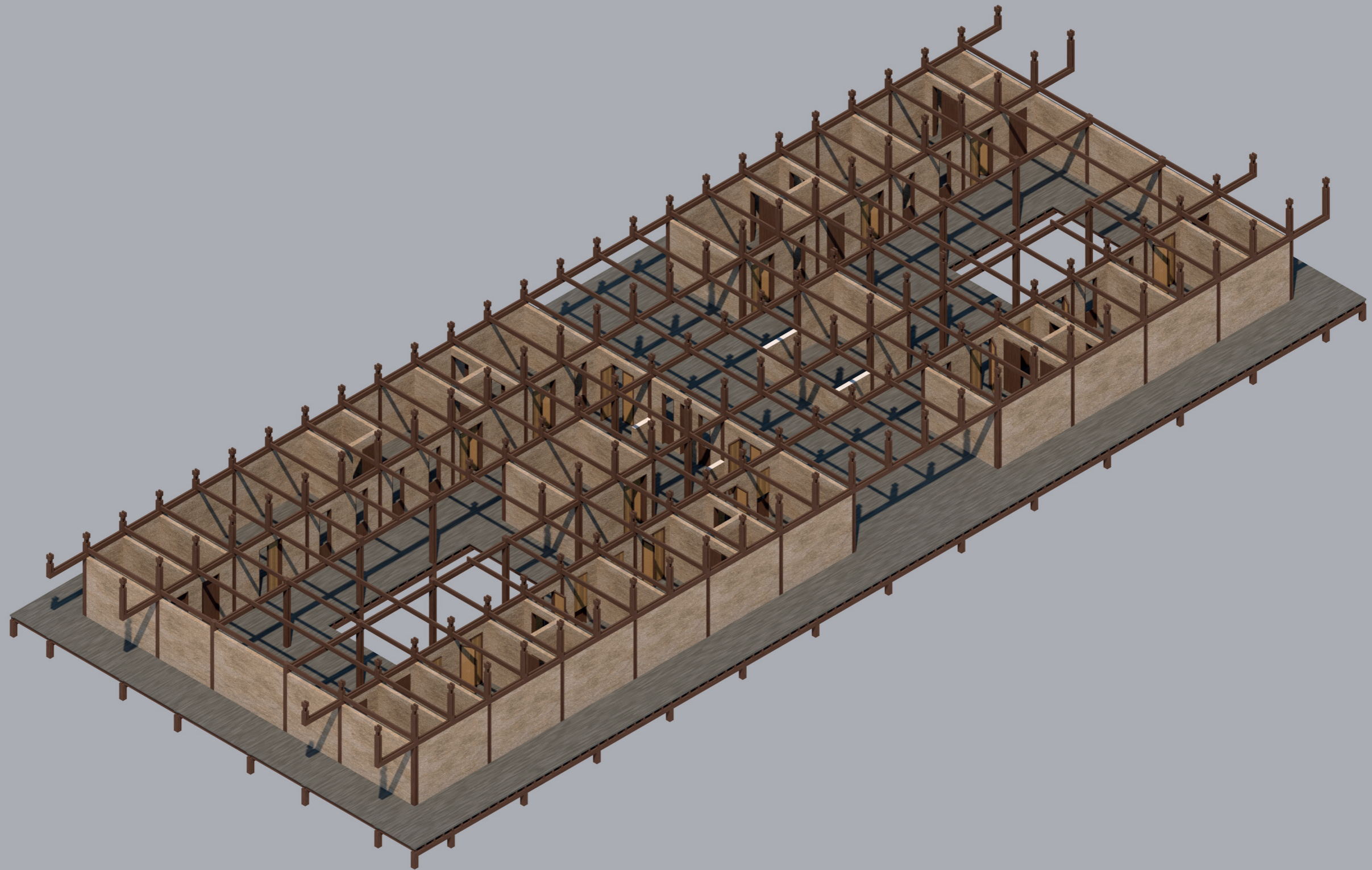
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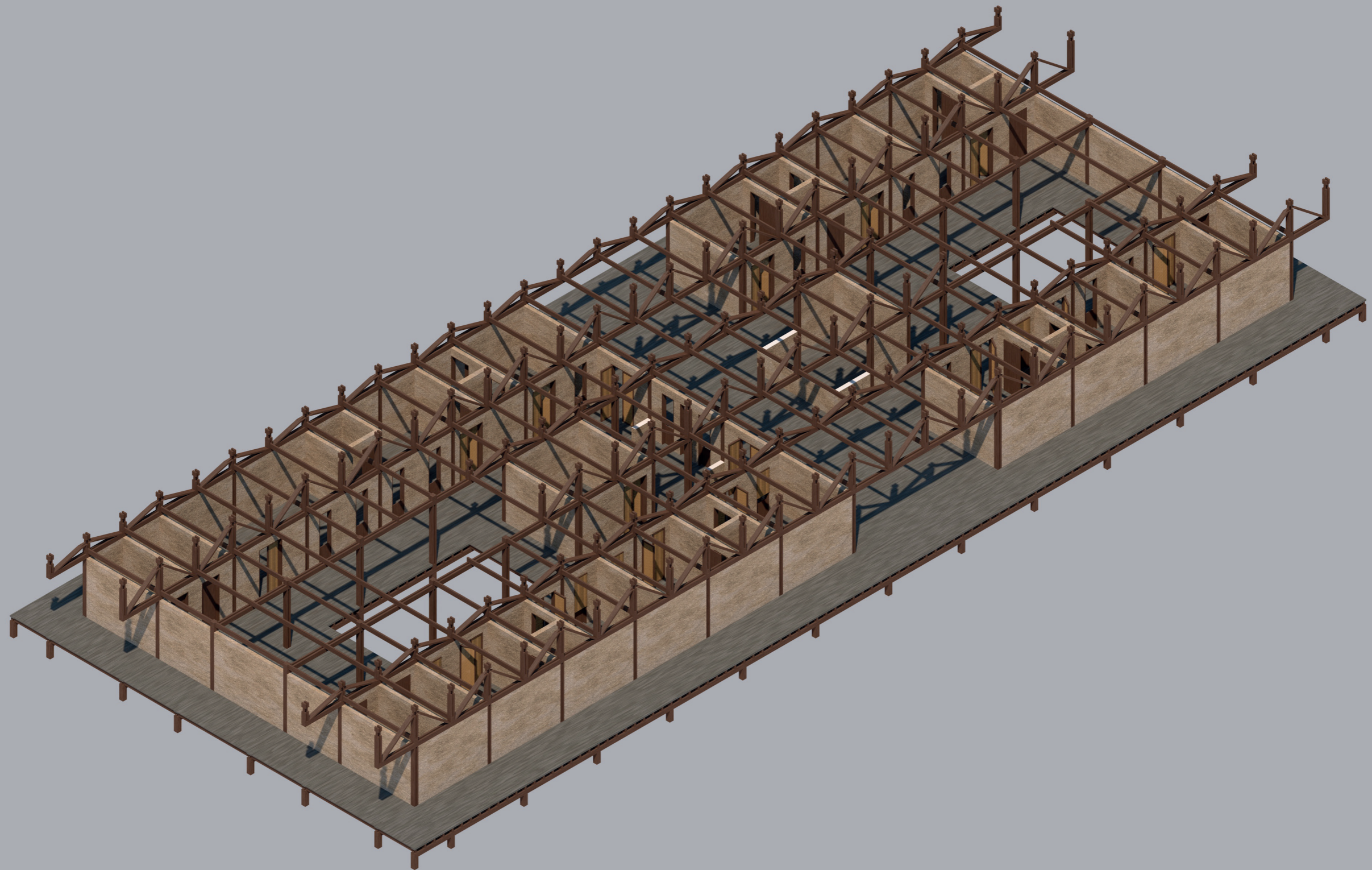
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# local and circular

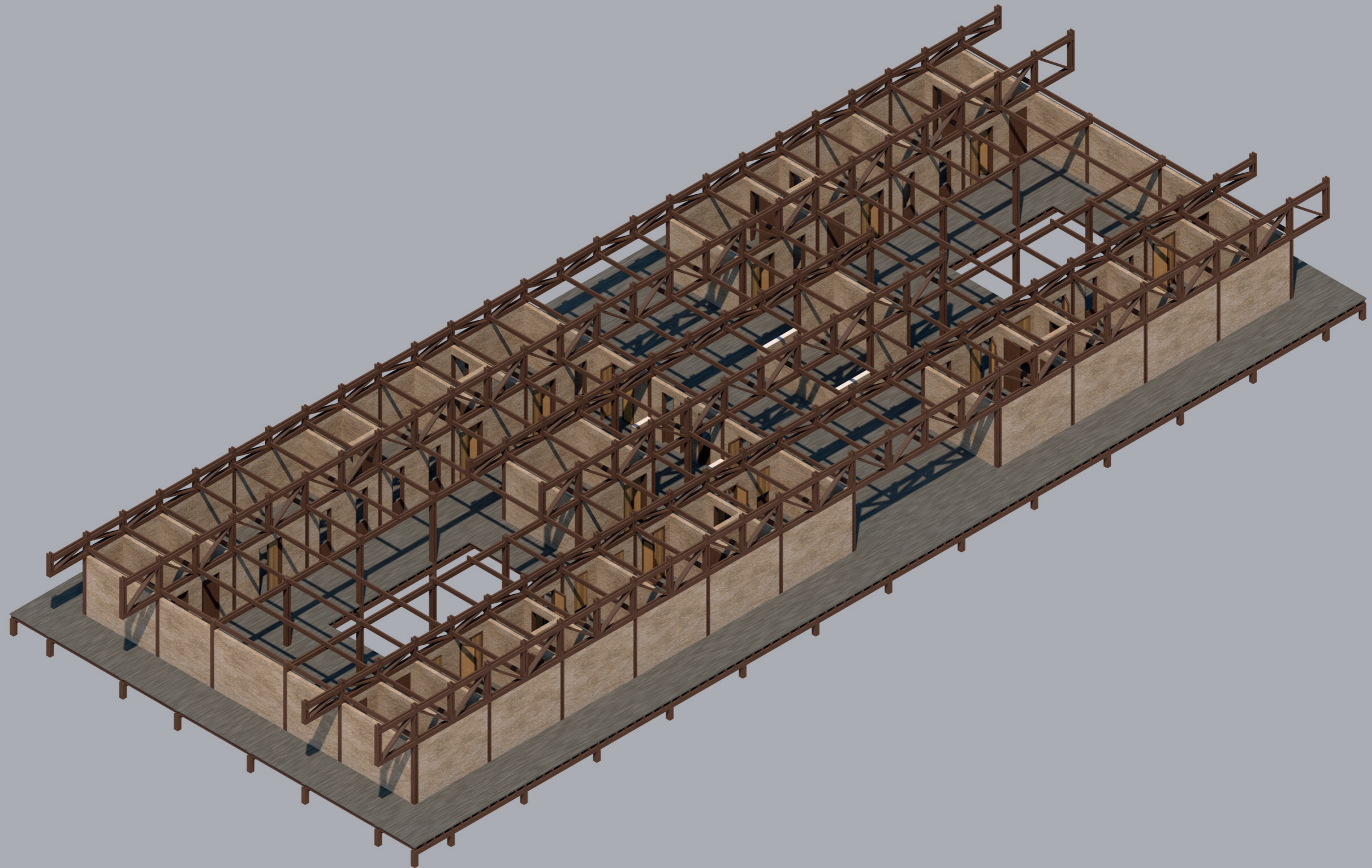
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# local and circular

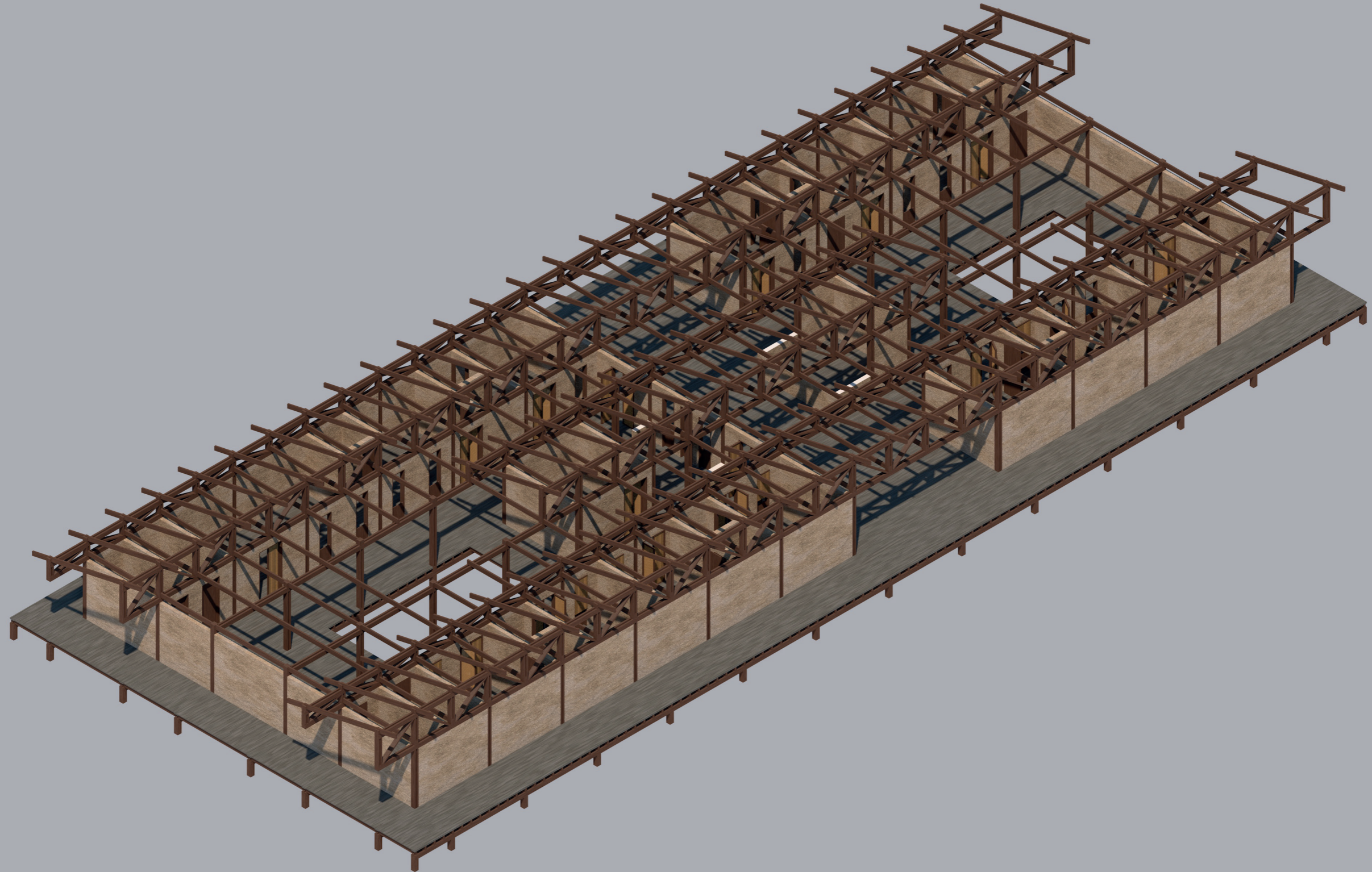
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# local and circular

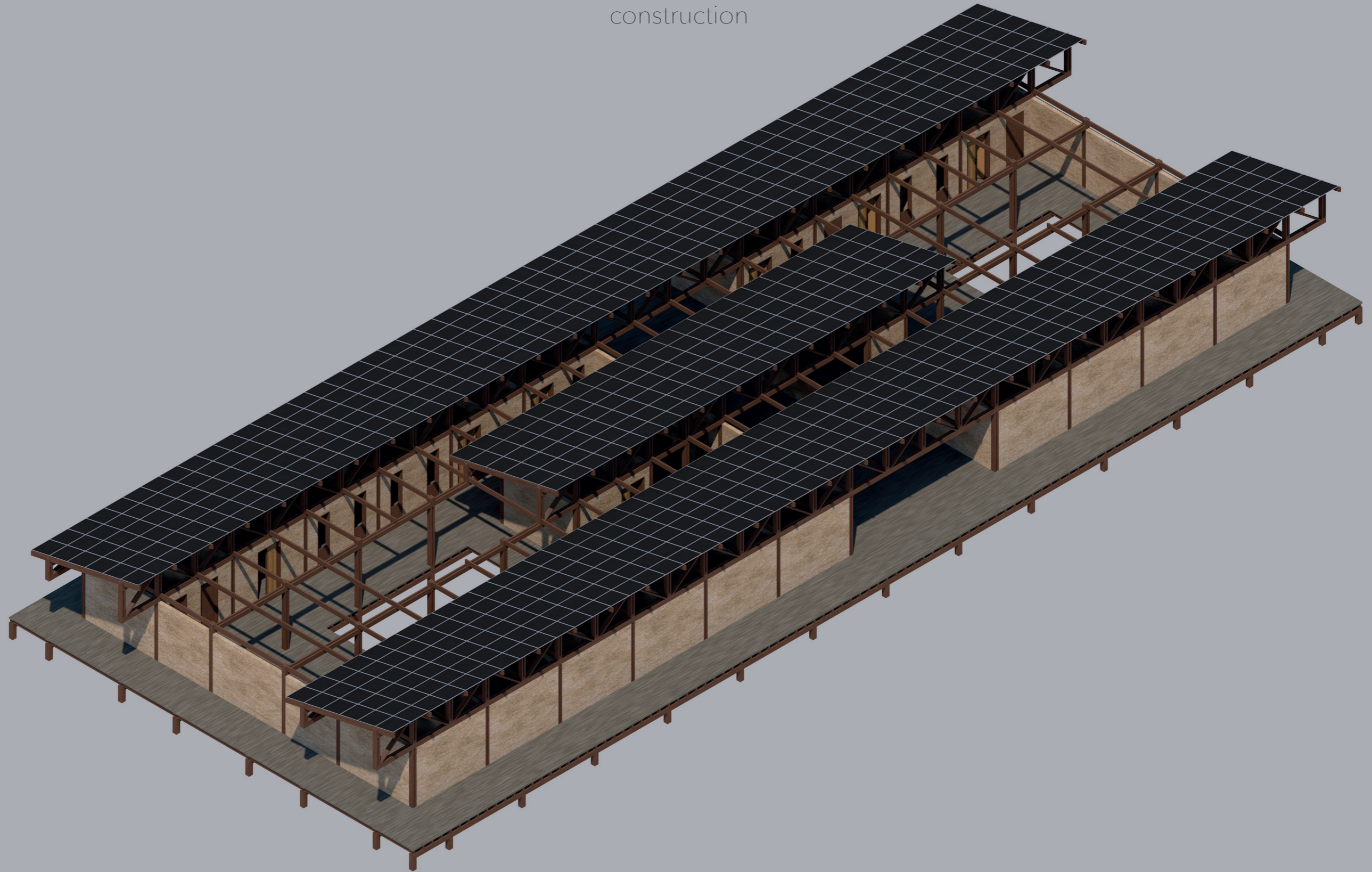
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# local and circular

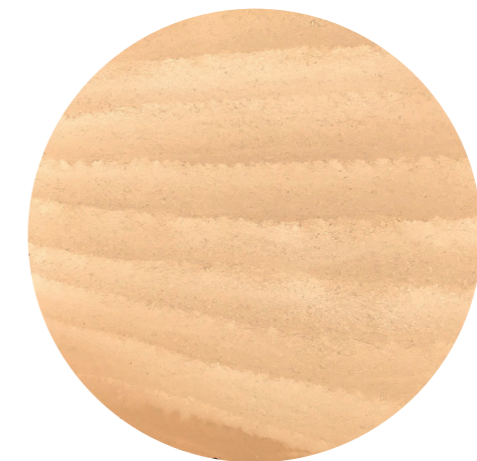
construction





# local and circular

bamboo shuttes and room dividers





# local and circular

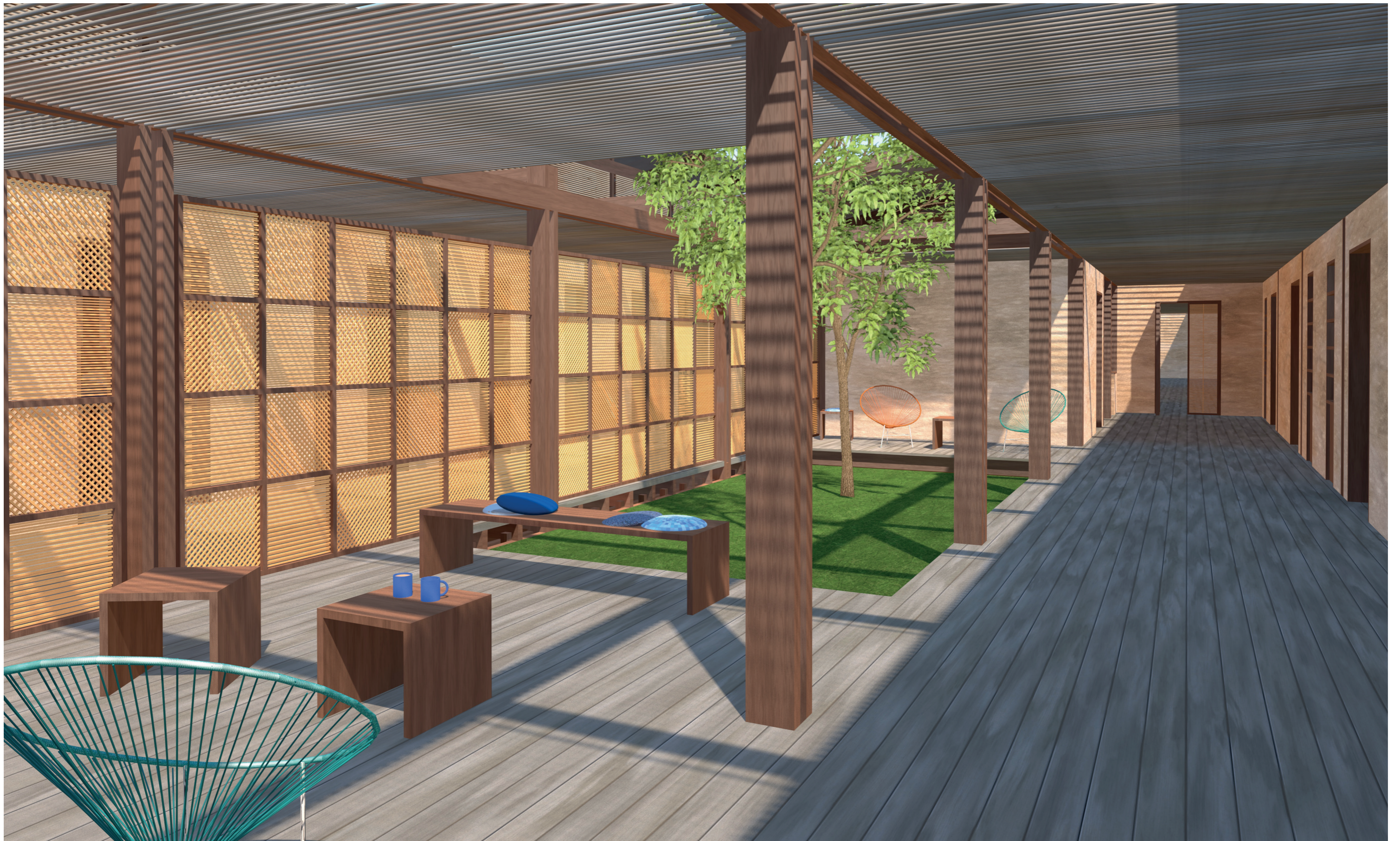
bamboo shuttes and room dividers





# local and circular

bamboo shuttes and room dividers



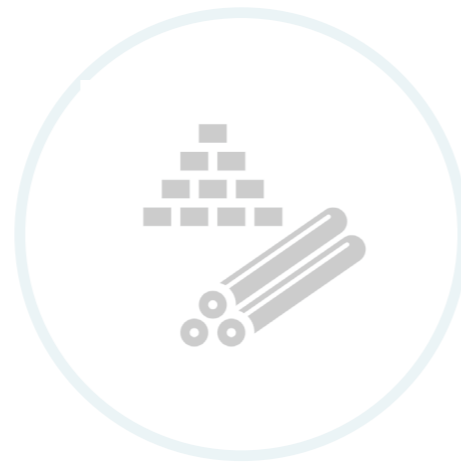


# passive building

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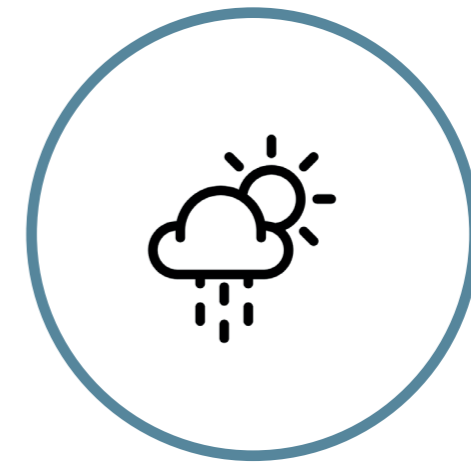
clear routing



local materials



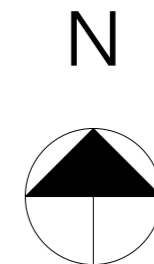
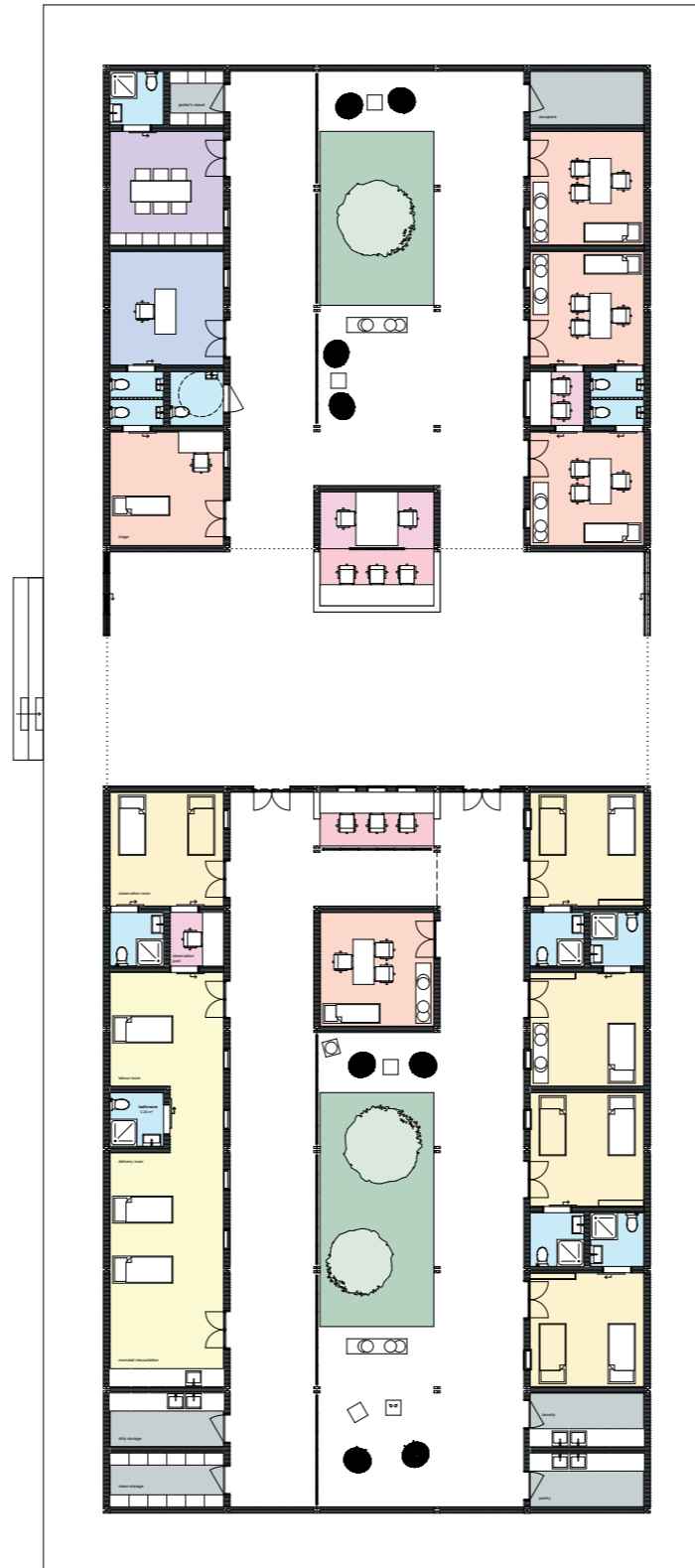
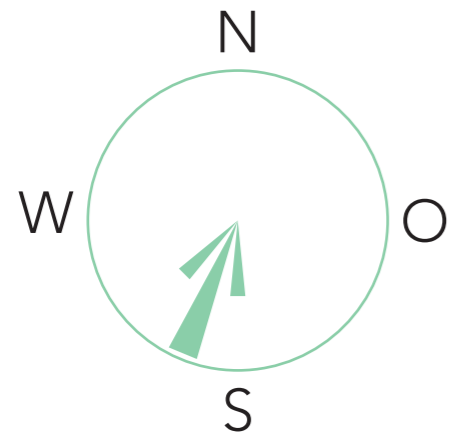
local craftsman



passive building



# passive building





# passive building

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# passive building

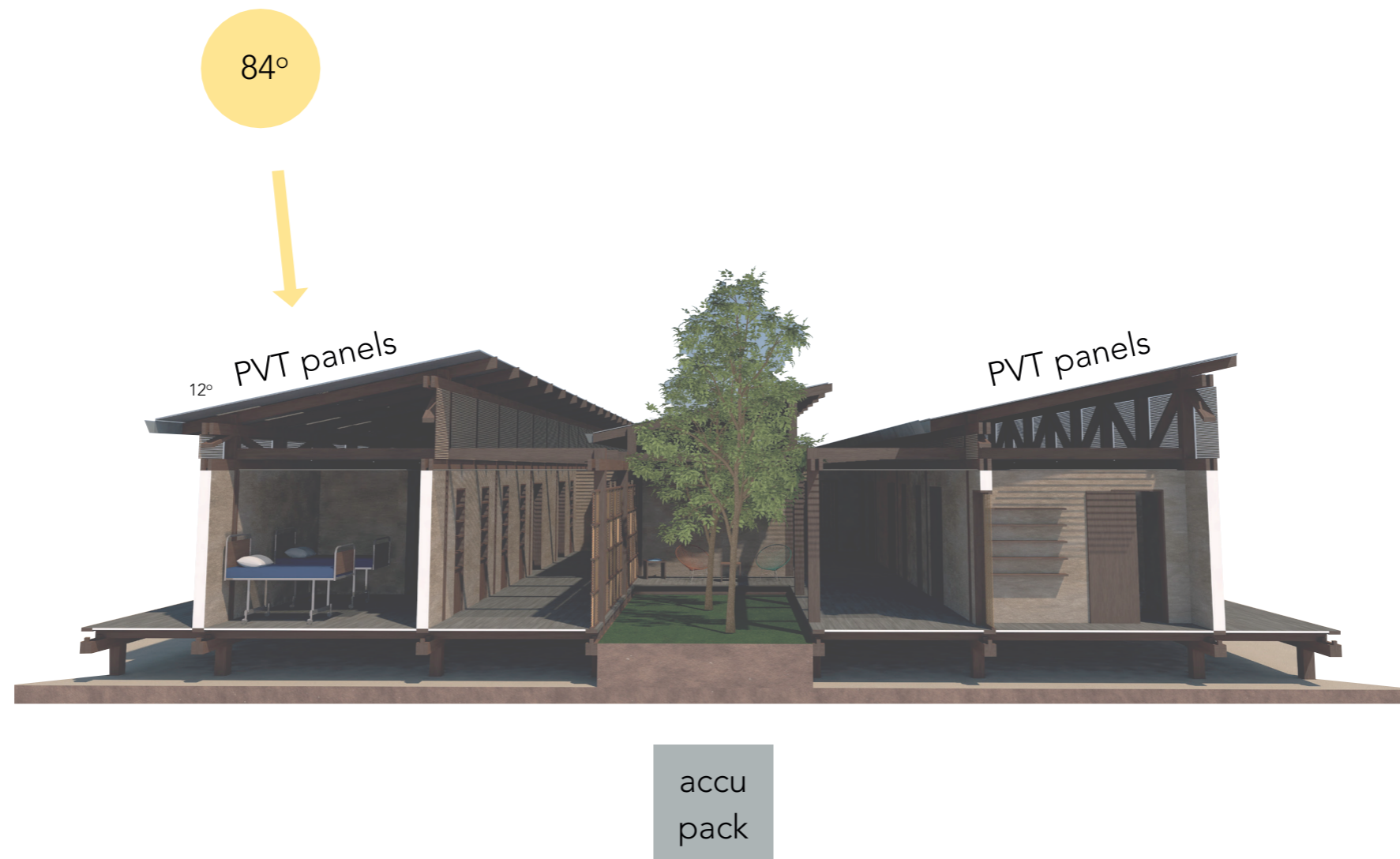
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# passive building

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# flexibility

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flat  
terrain



irregular  
terrain



at sea

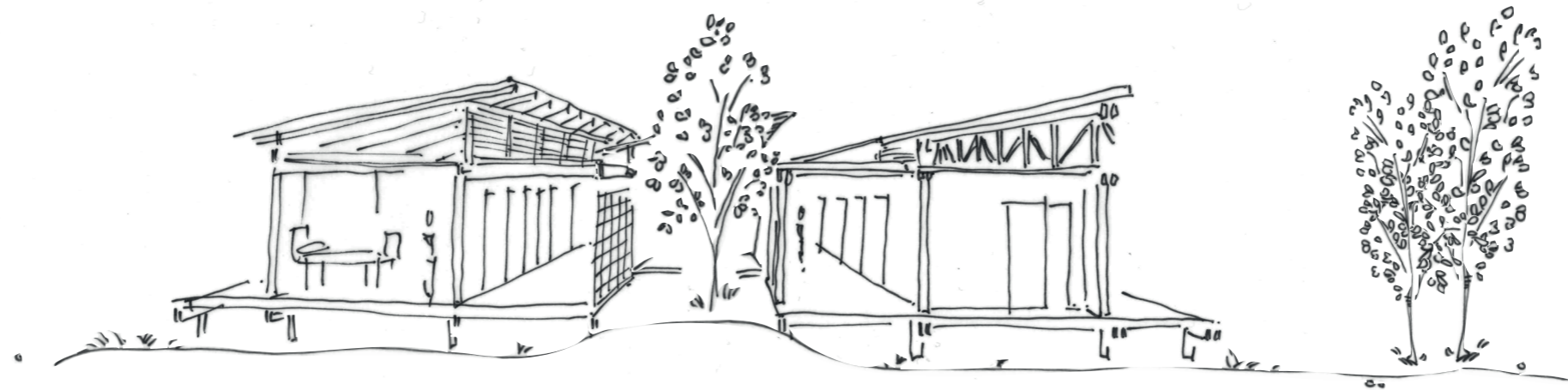


hilly terrain



# flexibility

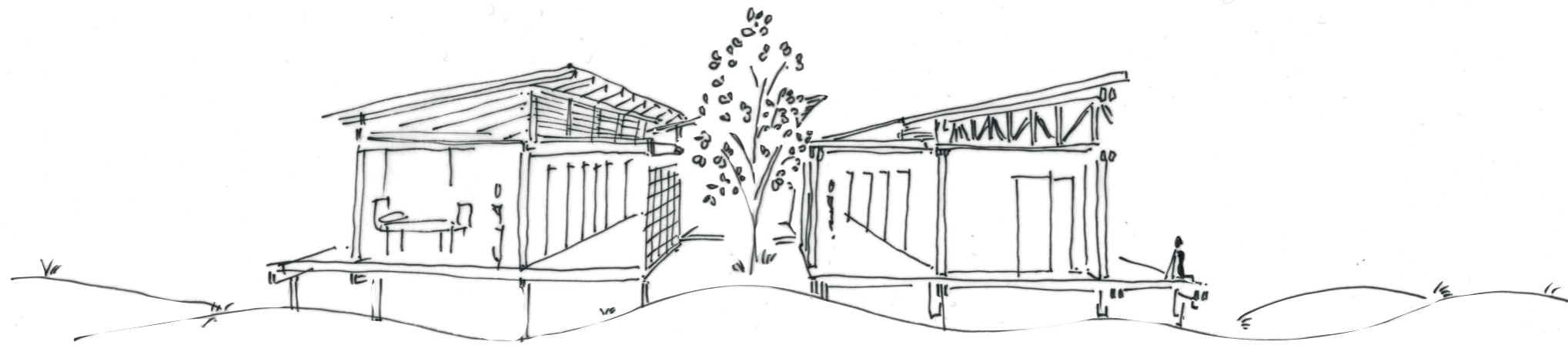
flat terrain





# flexibility

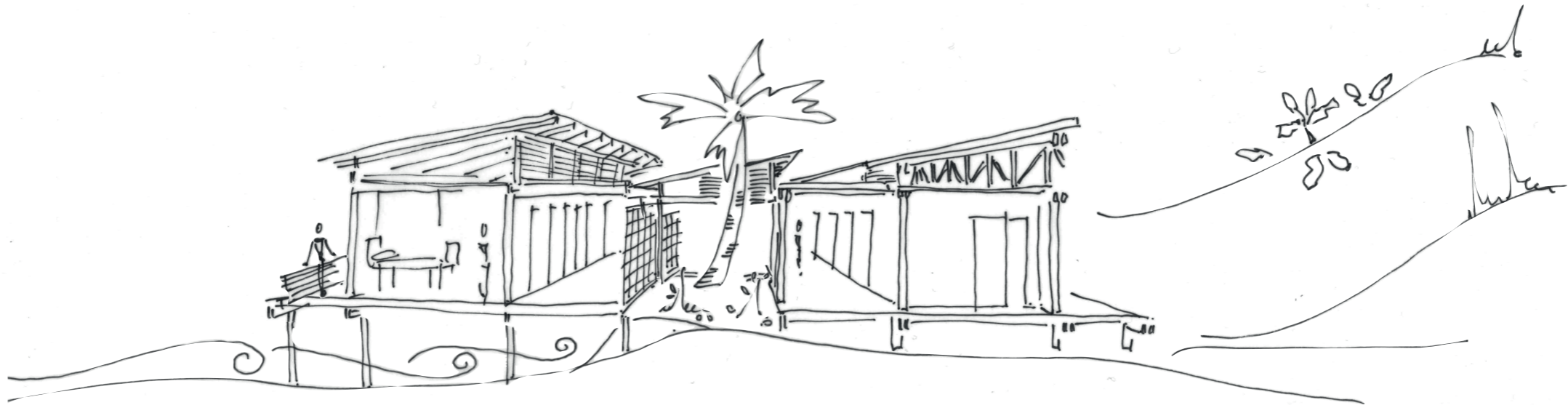
irregular terrain





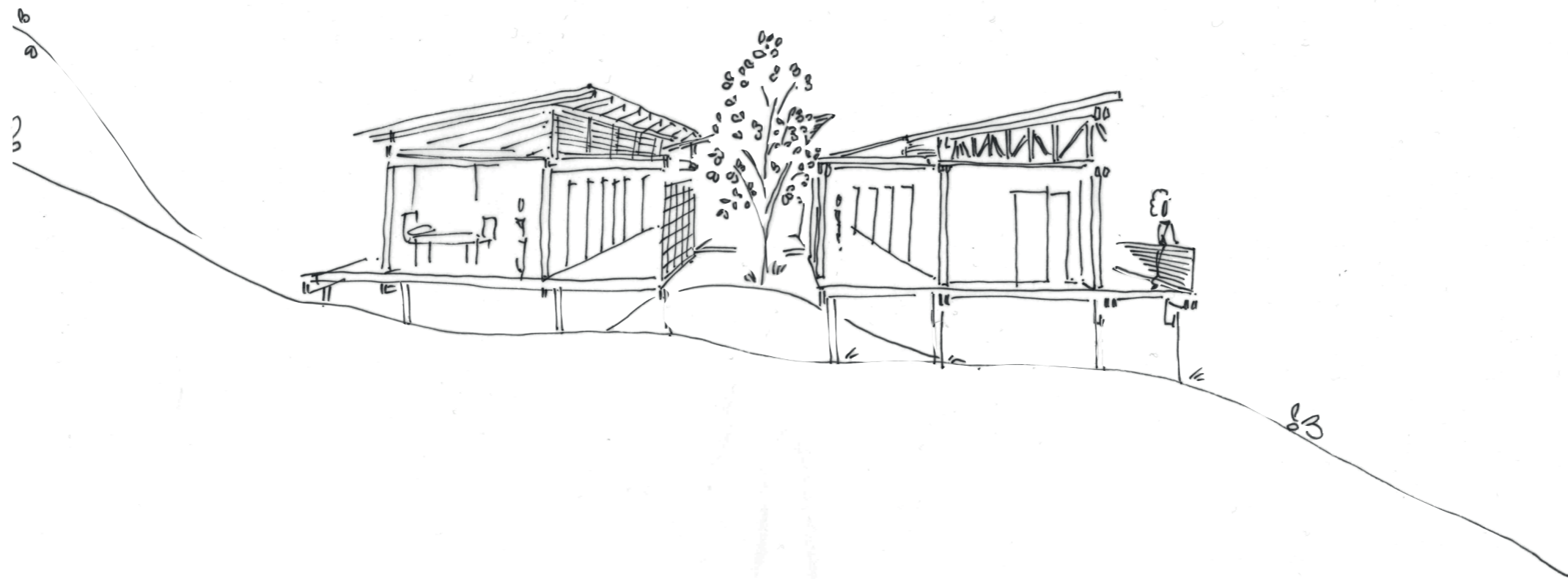
# flexibility

at sea



# flexibility

hilly terrain





# graduation project

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