HOSPITABLE MOVEMENT

Jasper Sterrenburg - 5653673

Advanced Housing Design



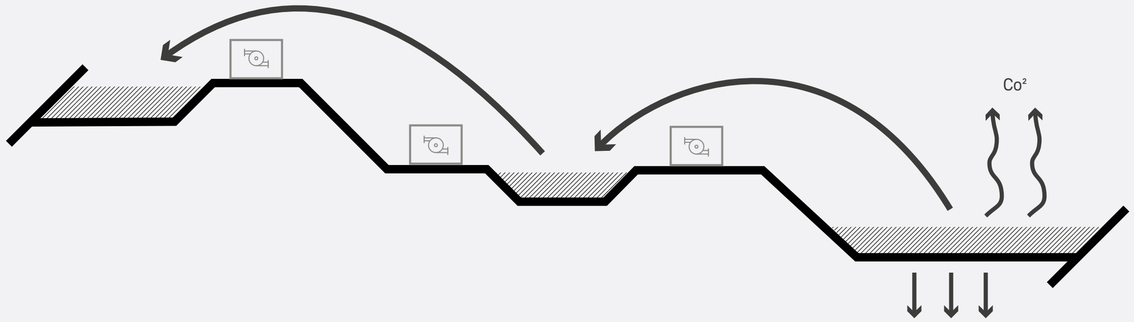
Contents

- Research
- Building design
- Building demountable



Peat & Water in the Netherlands






matig
uw
snelheid
i.v.m.
trillings-
hinder






POLDER
SCHIEVEEN
www.polderpad.nl

National Productive Park Delftland





Source: ZUS, remixed by JS

NATIONAL PRODUCTIVE PARK DELFTLAND

REDESIGNING DELTA

ZUS [Zones Urbaines Sensibles]
Flux
Sweco

National Productive Park Delftland





Source: ZUS, remixed by JS

NATIONAL PRODUCTIVE PARK DELFTLAND

REDESIGNING DELTA

ZUS [Zones Urbaines Sensibles]
Flux
Sweco

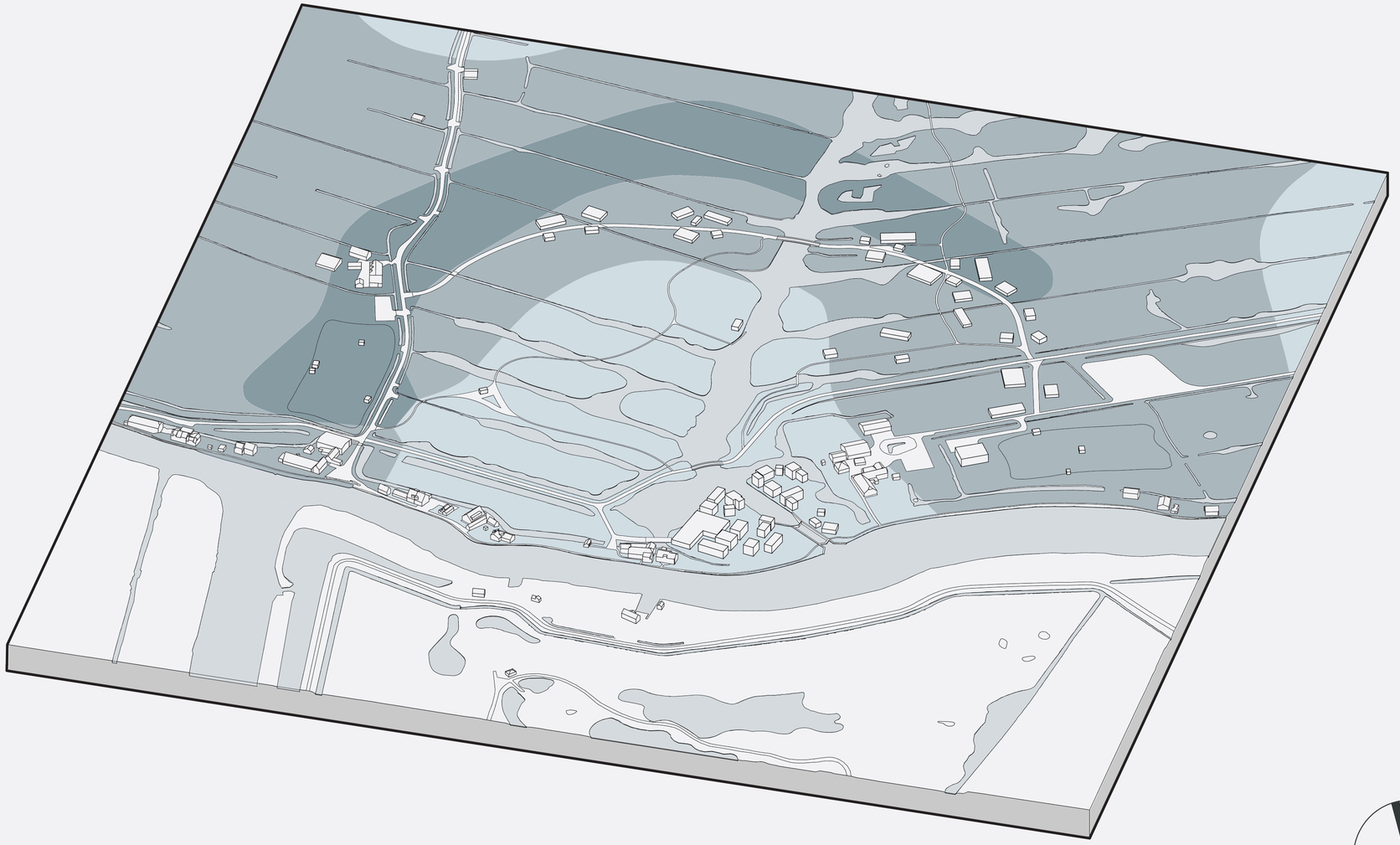


Soil Conditions

Tidal-Inversion Ridge

Marine-Based Clay

Peat



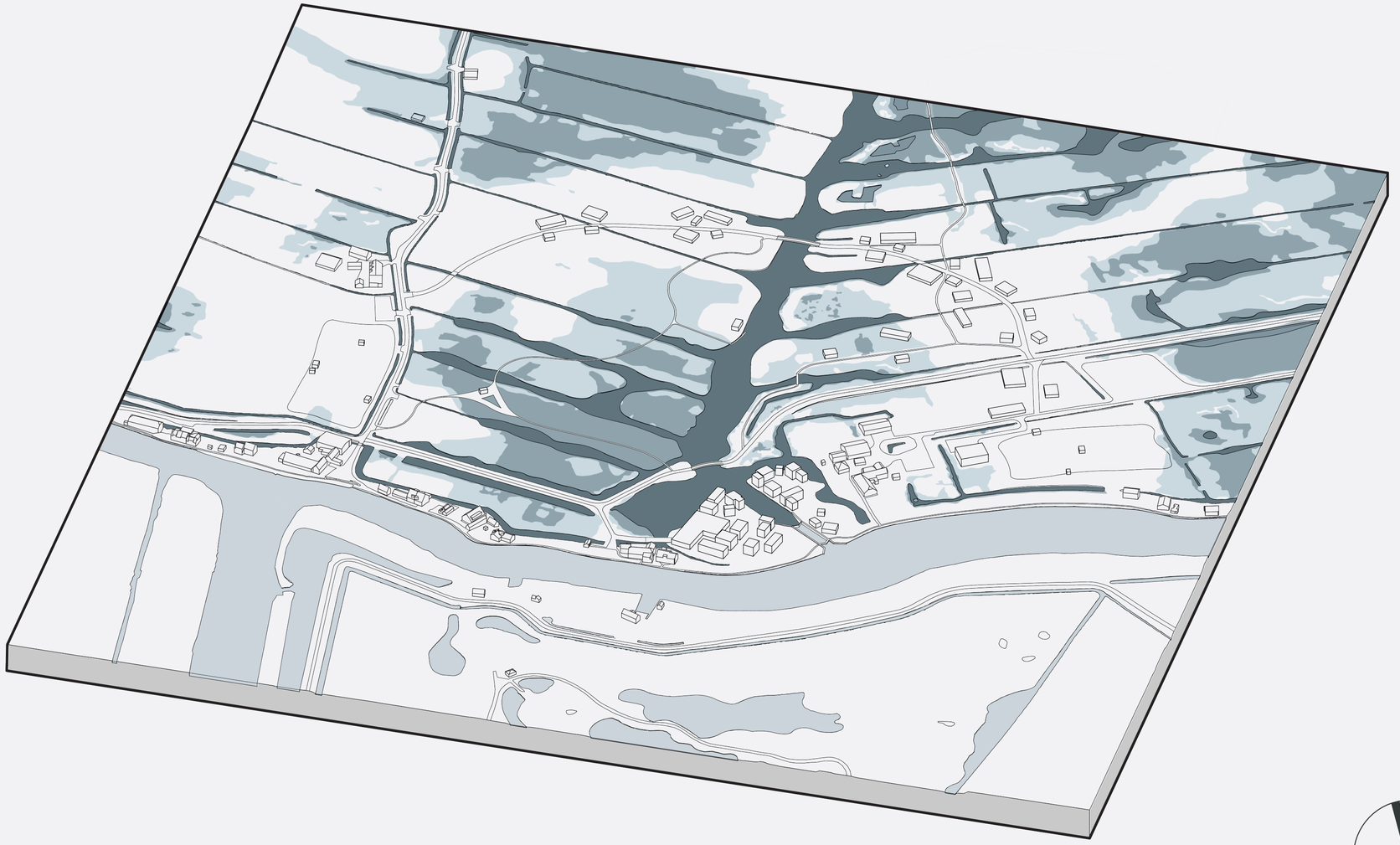


Water Influence

Normal waterlevel

60 mm/h

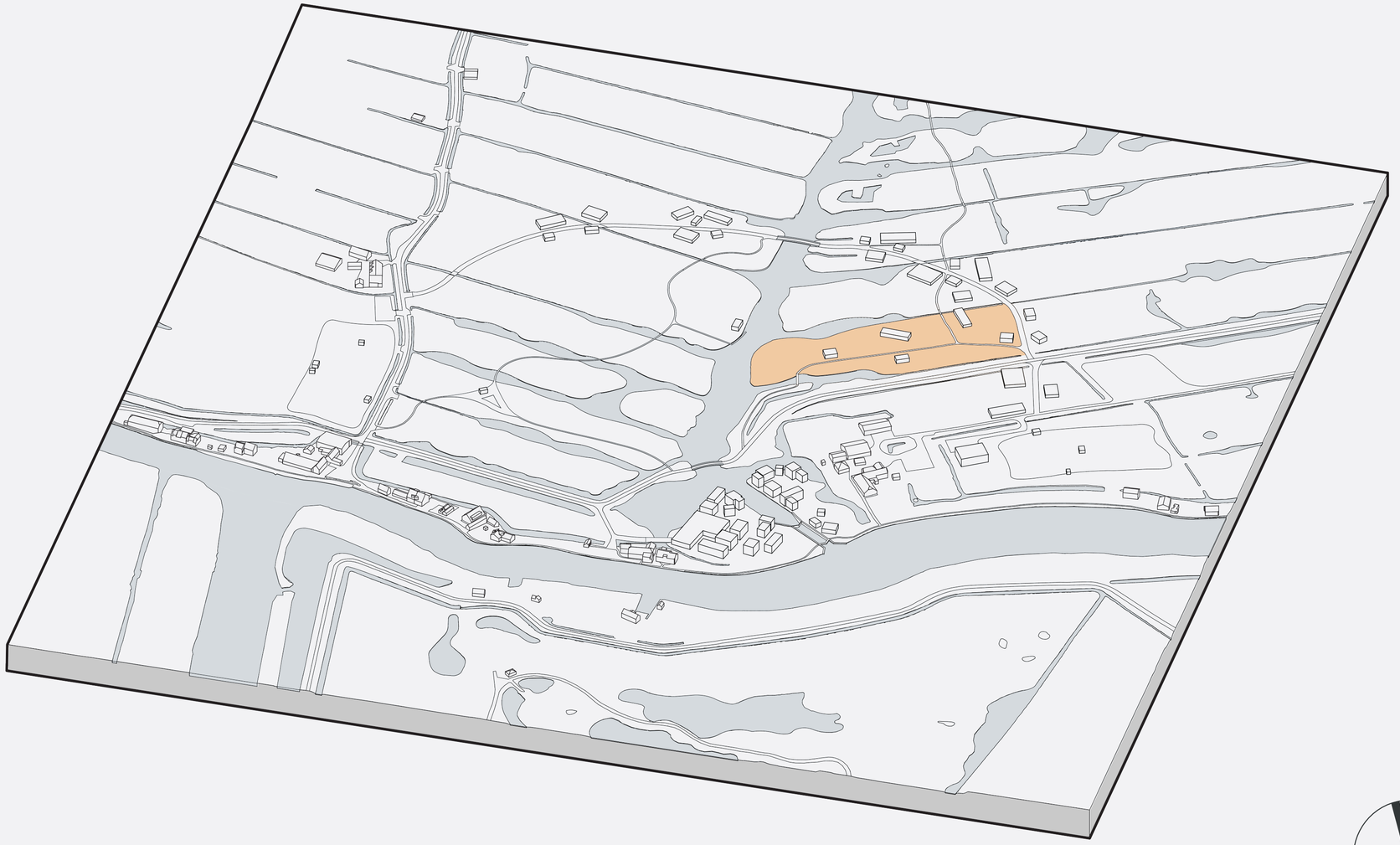
90 mm/h





Selected Site

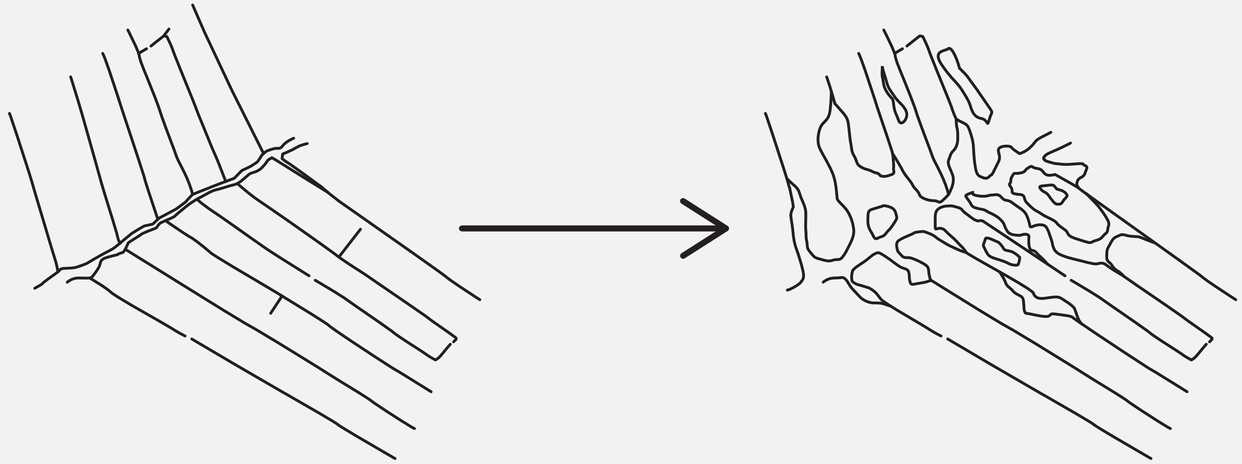
Selected Site





Changing Landscape

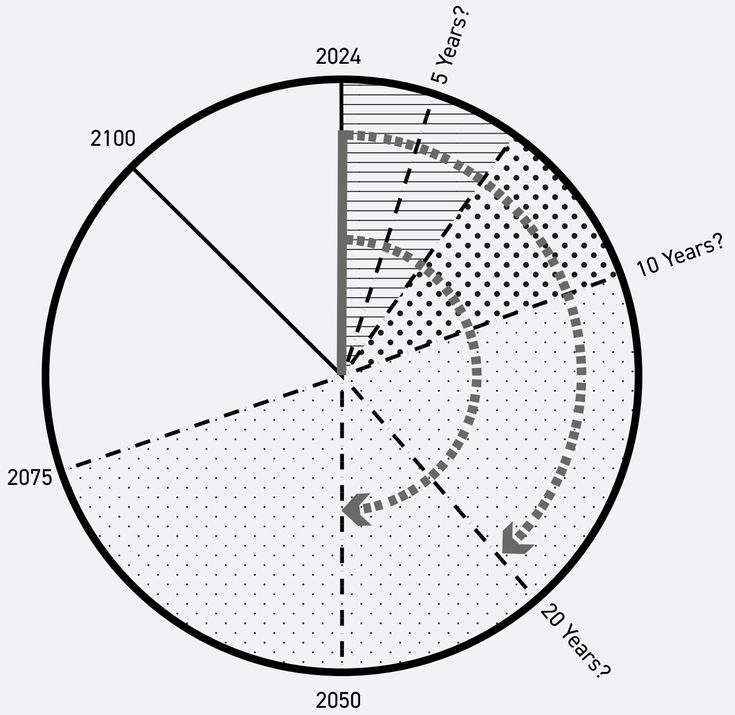


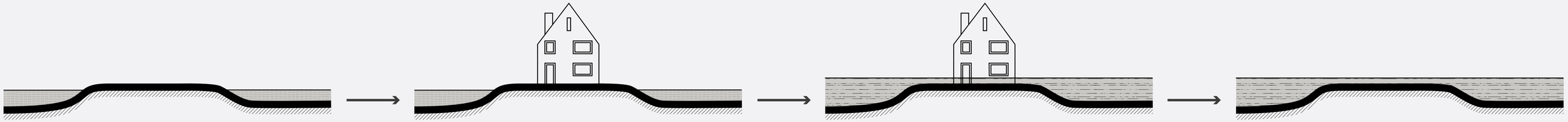


Polder

Wetlands

Target Groups





The permanently non-permanent

Source: Einszueins

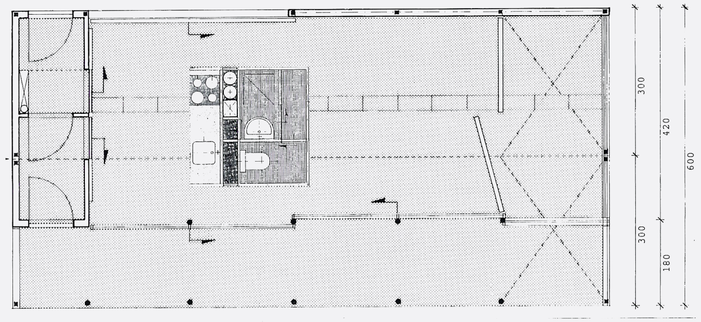


Source: Archdaily

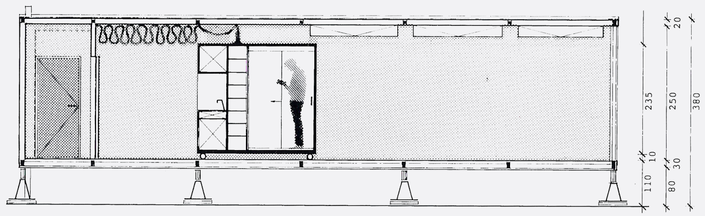


The contemporary Datsja

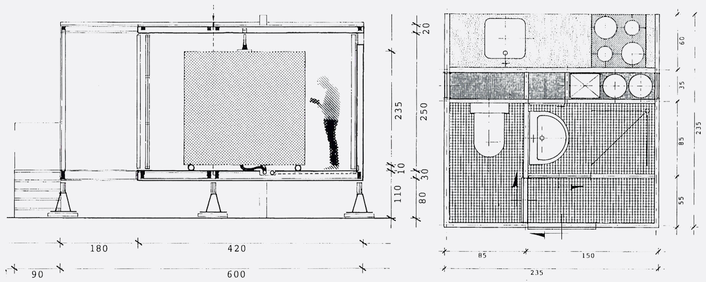
Source: Ontwerpend aan Holland



Plattegrond



Langsdoorsnede

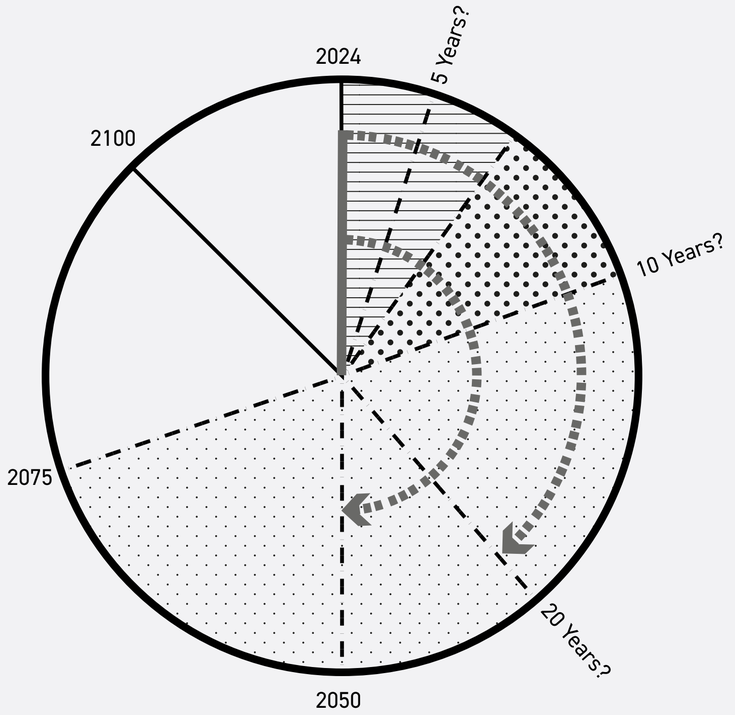


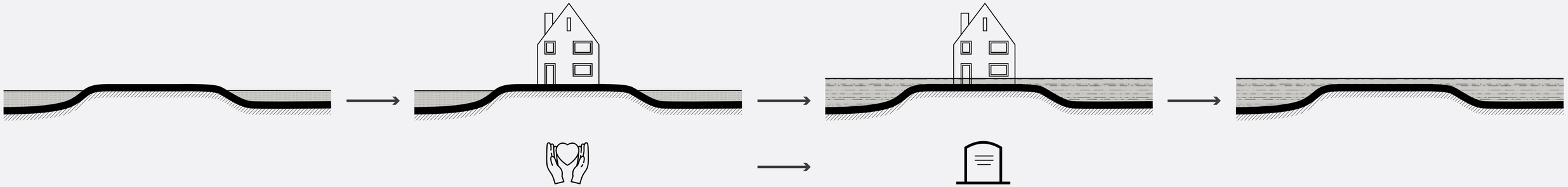
Dwarsdoorsnede en verplaatsbare kern

Source: Ontwerpend aan Holland



A hospitable Movement





Healing by nature

Source: Archdaily

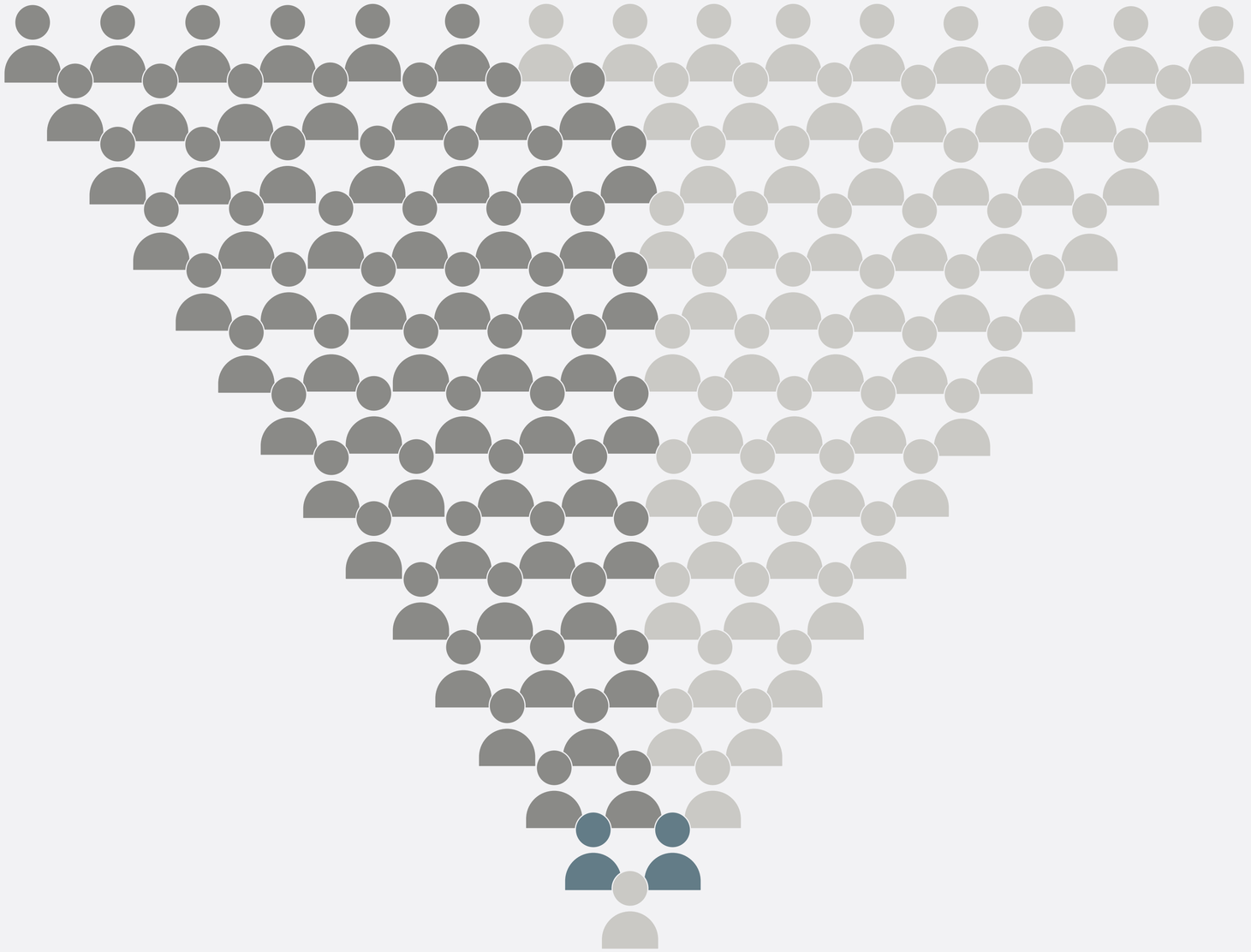


Source: Archdaily



Running a hospice

- ran by 120 volunteers
- just two staff members
- Funding by gifts
- A home-like environment



Reference Hospices

Hospice de liefde



575 m²



Source: Architectenweb

Hospice het tweede thuis



Source: Prosman Architecten

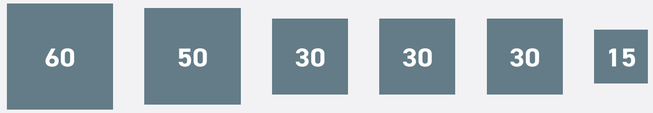


675 m²

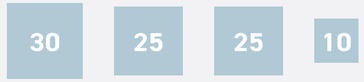
Building Program



Private area (300 m²)



Public area (215 m²)



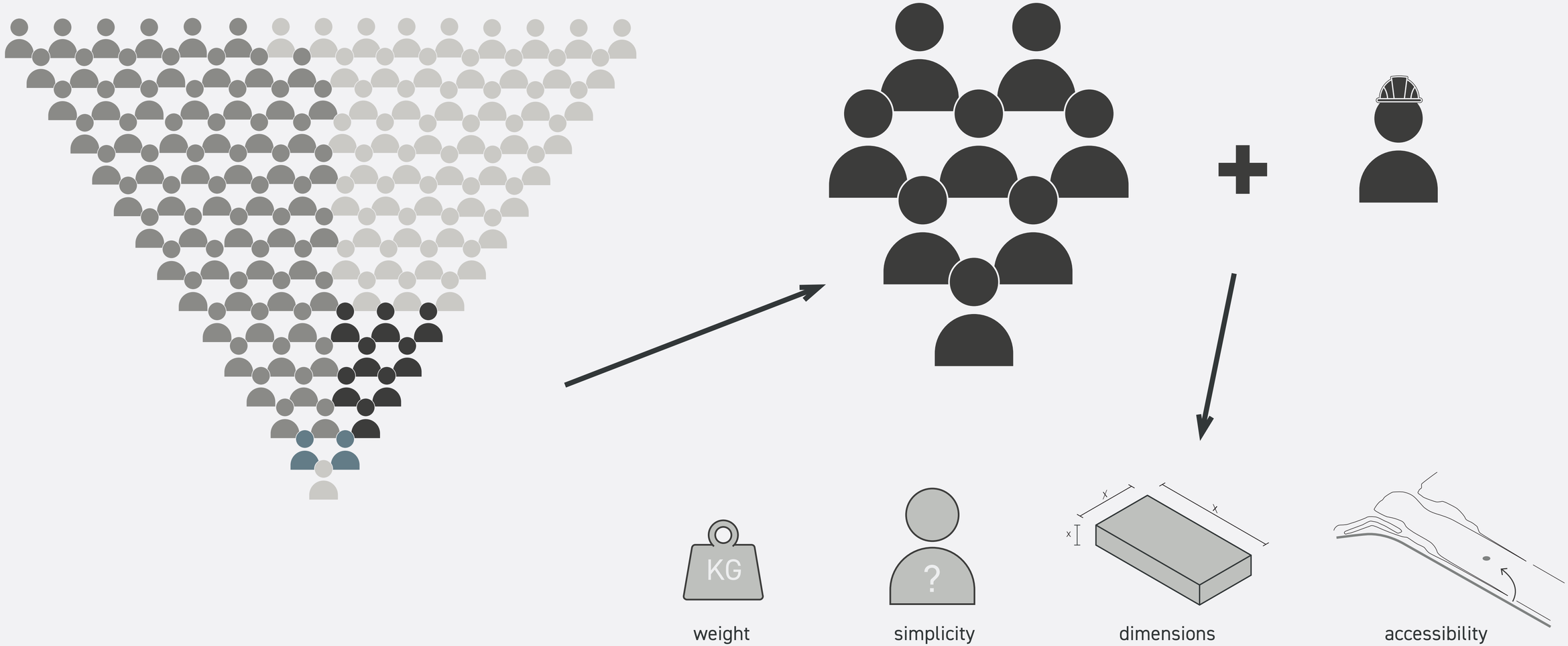
Service area (90 m²)

605 m²

Room Name	Area (m²)	Amount	Aditional Information	Borders Space
Entrance combined with reception	30 m²	1		
Living room	30 m²	1		circulation, dining and kitchen
Dining + kitchen	50 m²	1	main kitchen for general meals & small counter for private use	living room, criculation, supplies
Aula	60 m²	1	used for group meetings and as grieving room for larger groups	circulation, entrance / reception
Family room	30 m²	1	used for meetings and as grieving room for smaller groups	circulation, entrance reception
General toilets	15 m²	1	Including toilet for disabled	living room, kitchen, entrance
Guest parking space		6		
Staff parking		6		
Supplies parking		4	parking suited for a supply van	close to kitchen and storage
Drop off point		1	enables patients to be dropped of under a canopy near the entrance	entrance
Garden or patio dependant on landscape and overall setting	ca 60 m²	1		

Room Name	Area (m²)	Amount	Aditional Information	Borders Space
Palliative dwelling	40 m²	6 + 2 optional	includes a private bathroom with toilet	circulation system, has own HVAC system
Nurse office	30 m²	1	includes drugs storage	close to reception and palliative dwelling
Coördinator office	10 m²	1		close to the reception and entrance
Meeting room	15 m²	1	suited for family meetings and staff meetings	close to the administrative cluster
Private outdoor area	5 m²	6 + 2 optional		private dwellings
Supplies	30 m²	1	used for the storage of medical and food supplies	kitchen, dining and living room
Laundrette	25 m²	1	used for linnen and private use by relatives	supplies, circulation, nearby palliative dwellings
Building service systems	25 m²	1	includes heating HVAC etc.	reception area, supplies
Building maintenance storage	10 m²	1	for storing tools, gardening supplies, etc.	outdoor area, building services

Self-building & Demountability



DIY & Demountable

Source: Jean Prouvé

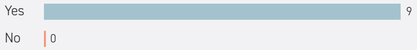


Source: The modern house

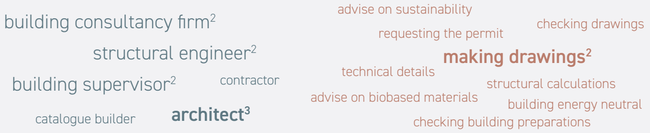


Survey Self-Building & Demountability

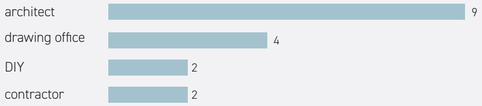
Q1
Would you recommend a self-builder to contact an advisor as preparation before they start building? (architect, technical engineer, structural engineer, etc.)



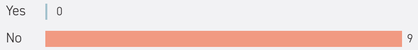
Q2
If yes, what type of advice or products would you recommend getting before starting a DIY building project, and who would you recommend asking?



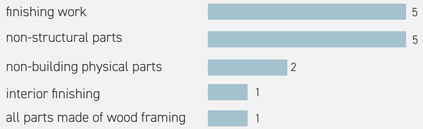
Q3
Expecting the self-builder knows how to draw, would you recommend them designing their building themselves or have it done by an architect?



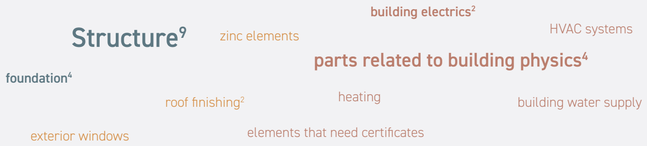
Q4
Would a self-builder be able to build all parts (foundation, structure, facade, etc.) of a building themselves, knowing that they don't have a lot of building experience?



Q5
What parts of a building would a self-builder be able to complete themselves in a DIY fashion, and why?



Q6
What parts of a building requires expert knowledge, and would you recommend to be executed by a contractor, and why?



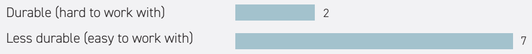
Q7
Would a self-builder be able to execute these building parts under supervision and support from a professional/ carpenter?



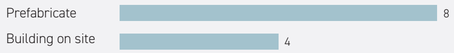
Q8
What materials would you recommend the self-builder for creating easy to assemble, demountable, and reusable buildings without a footprint?



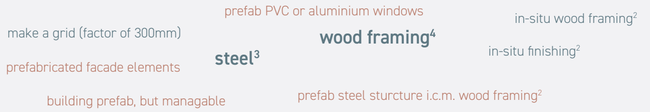
Q9
Would you recommend to the self-builder harder to process but more durable or easier and less durable materials requiring more maintenance?



Q10
Would you recommend building assembling a building in prefabricated elements, or build a demountable building on site?



Q11
What particular building techniques/methodologies would you recommend for this, keeping in mind that the building needs to be disassembled?



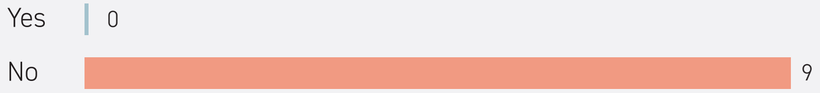
Q12
If the self-builder wants to find information, where would you recommend them looking for? (books, speaking to professionals, social media, etc.)



Survey Self-Building & Demountability

Q4

Would a self-builder be able to build all parts (foundation, structure, facade, etc.) of a building themselves, knowing that they don't have a lot of building experience?



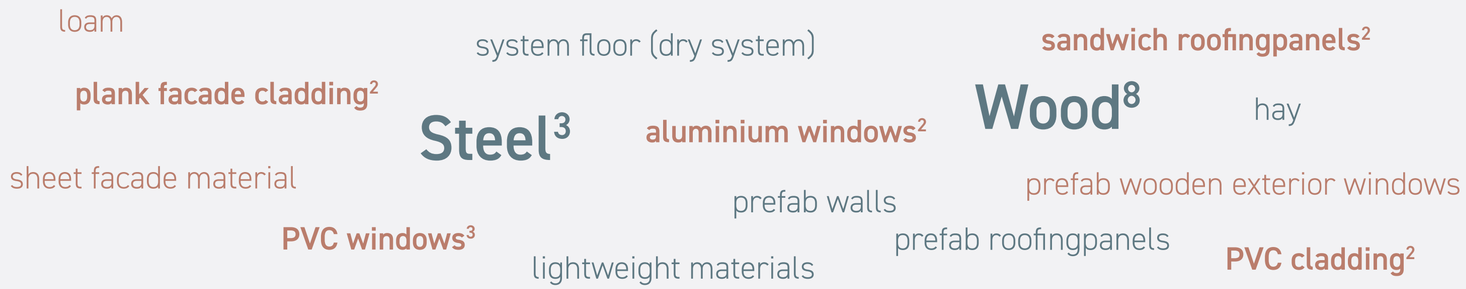
Q7

Would a self-builder be able to execute these building parts under supervision and support from a professional/ carpenter?



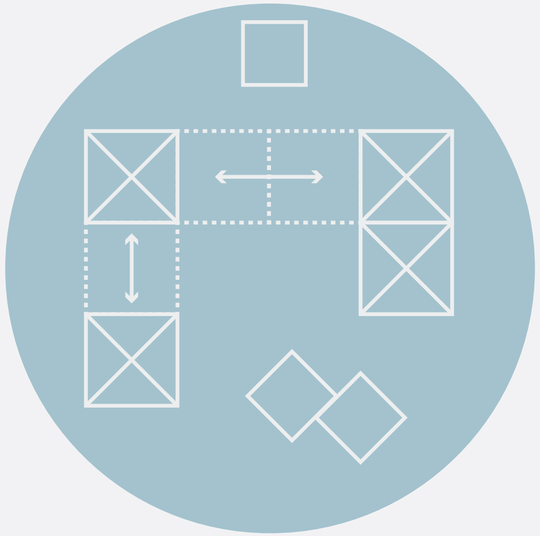
Q8

What materials would you recommend the self-builder for creating easy to assemble, demountable, and reusable buildings without a footprint?





Building Design







Building Organisation

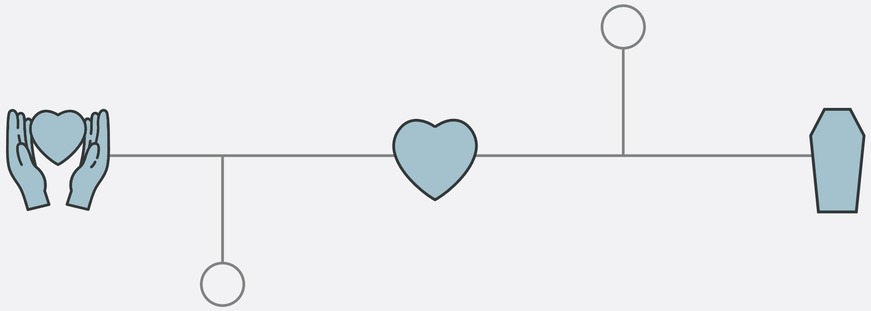




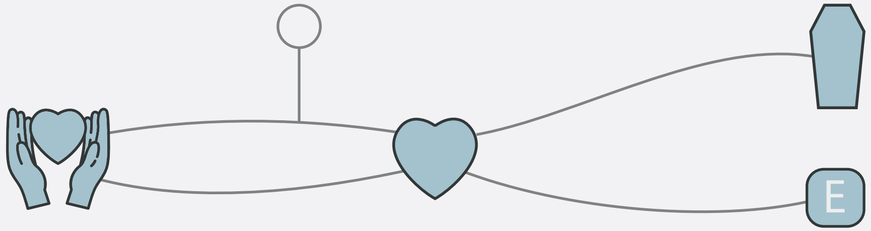


Building Schemes

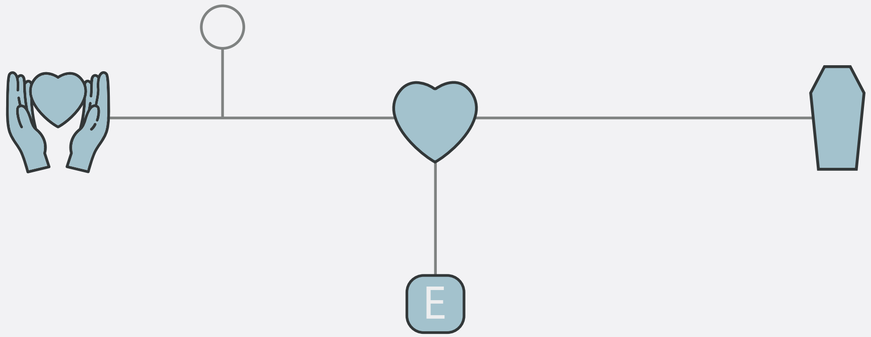
Center and Branch

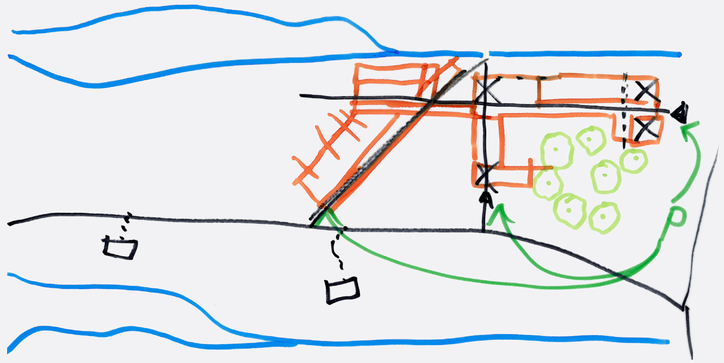


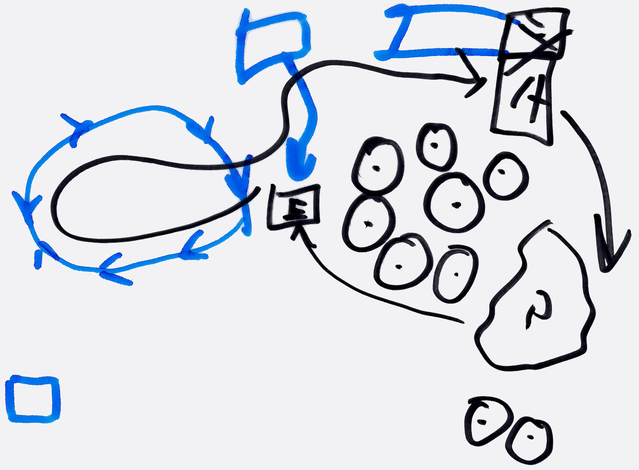
Circle of life

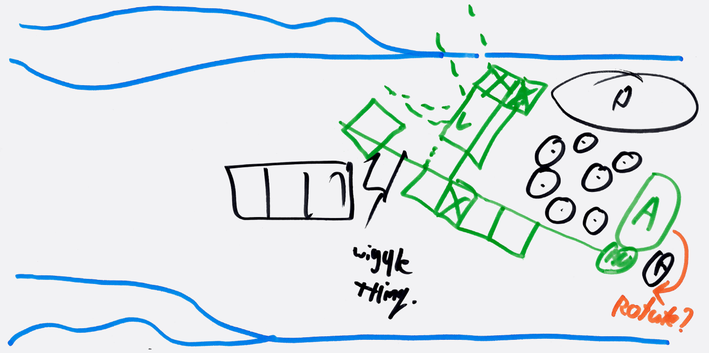


Start-Heart-End



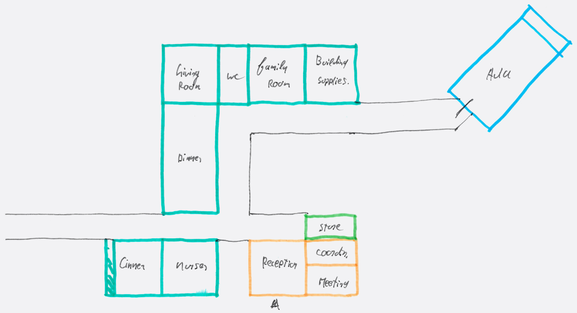




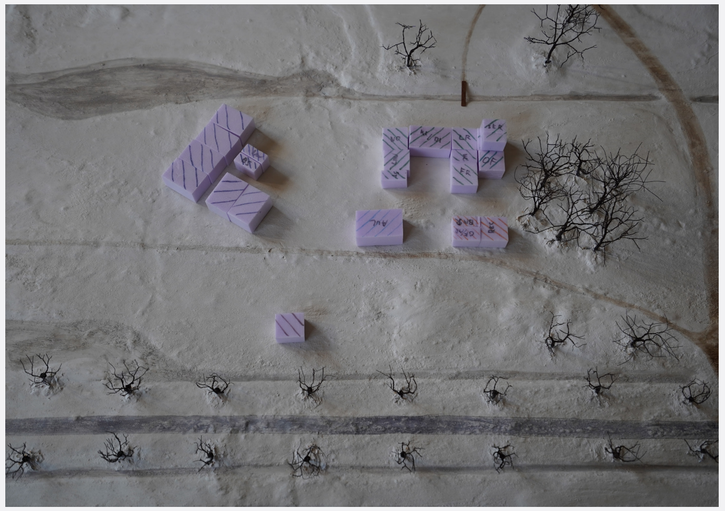


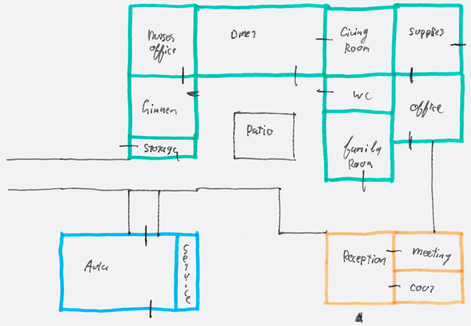
Building Schemes





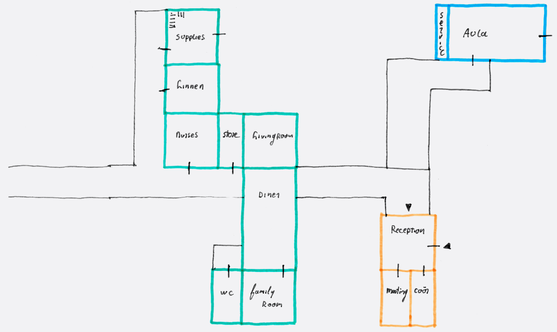
Design Aspect	Rating
Compactness	+
Public space view	+ +
Patio orientation	+
Nurse logistics	+ +
Visitor logistics	+





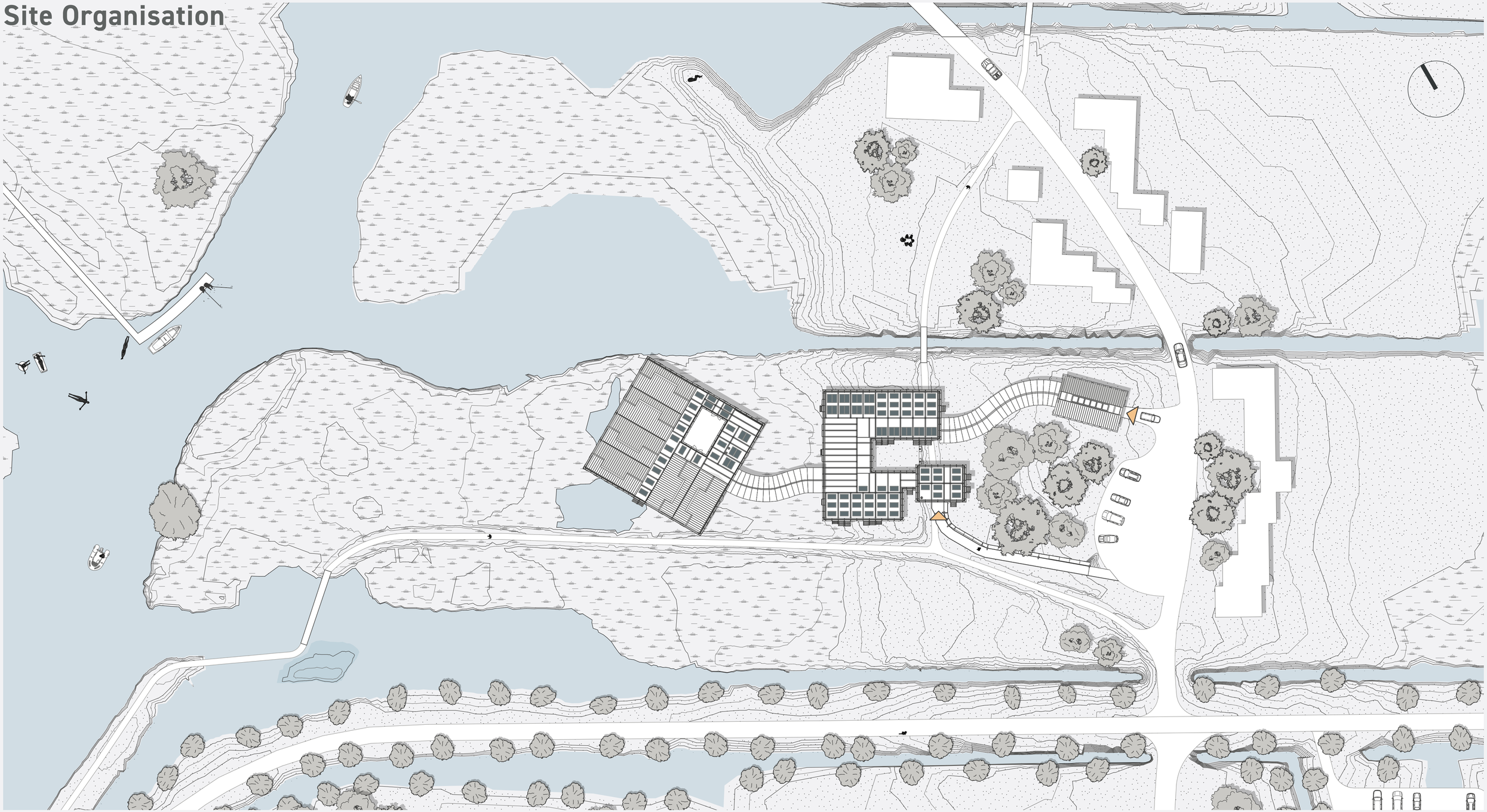
Design Aspect	Rating
Compactness	+ -
Public space view	+ -
Patio orientation	+ +
Nurse logistics	+
Visitor logistics	+





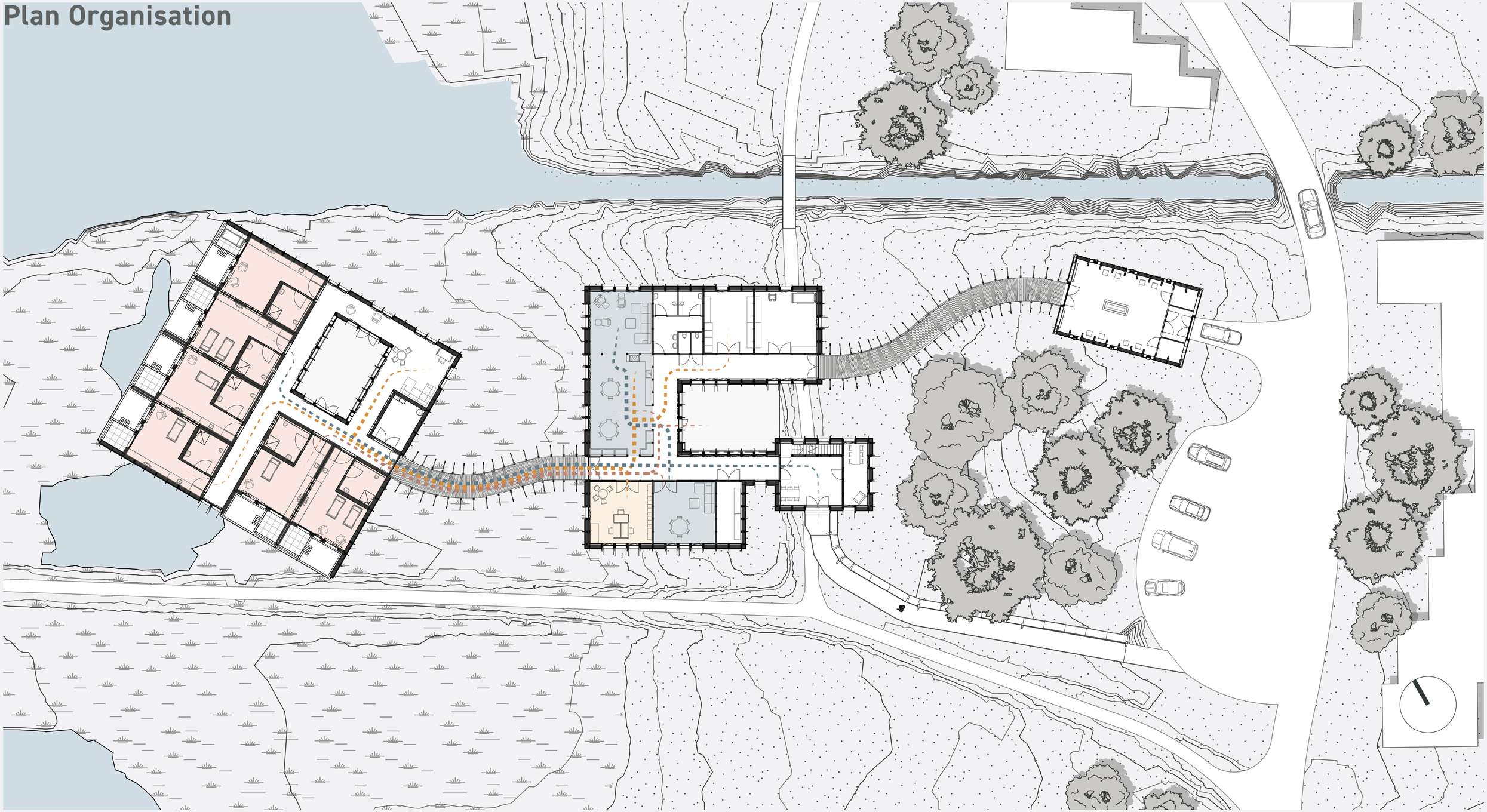
Design Aspect	Rating
Compactness	-
Public space view	-
Patio orientation	- -
Nurse logistics	+ -
Visitor logistics	-

Site Organisation





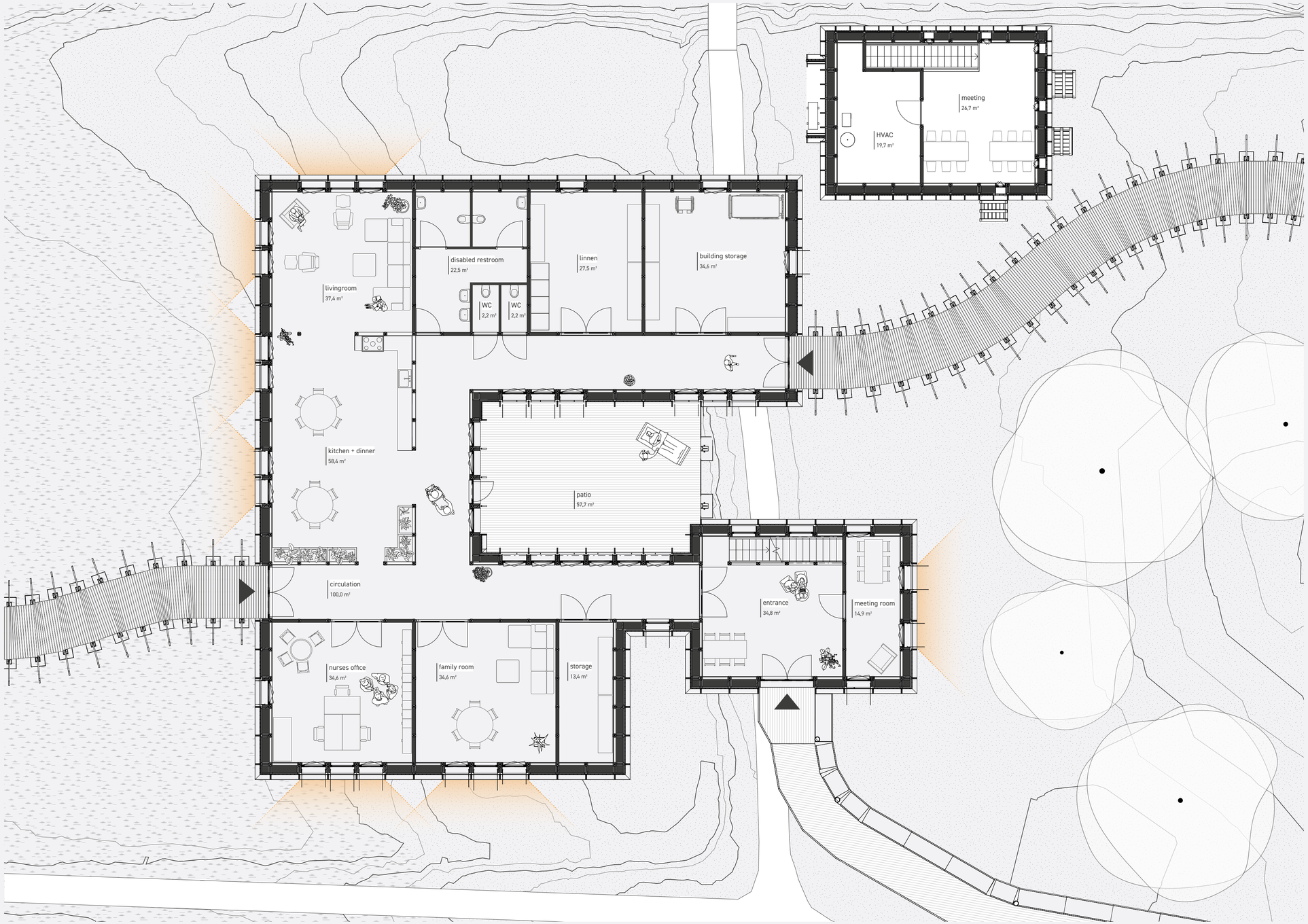
Plan Organisation





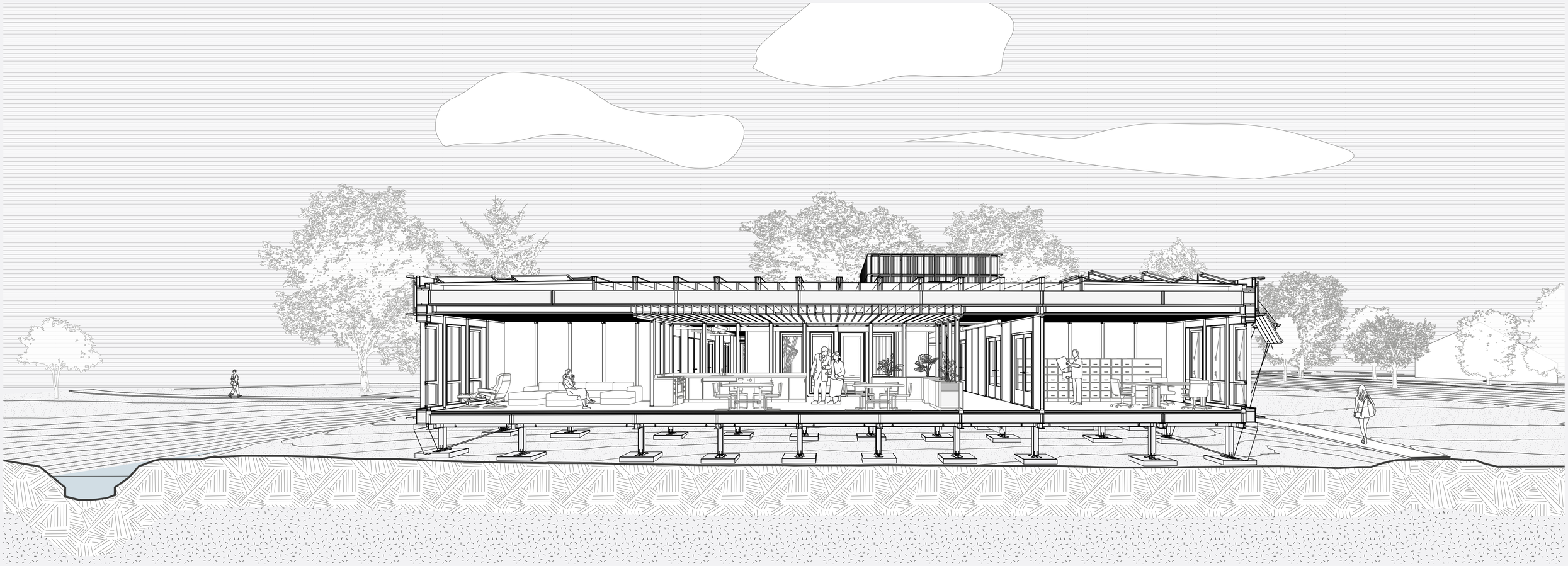
Central Heart

Ground floor + first floor



Central Heart

Section

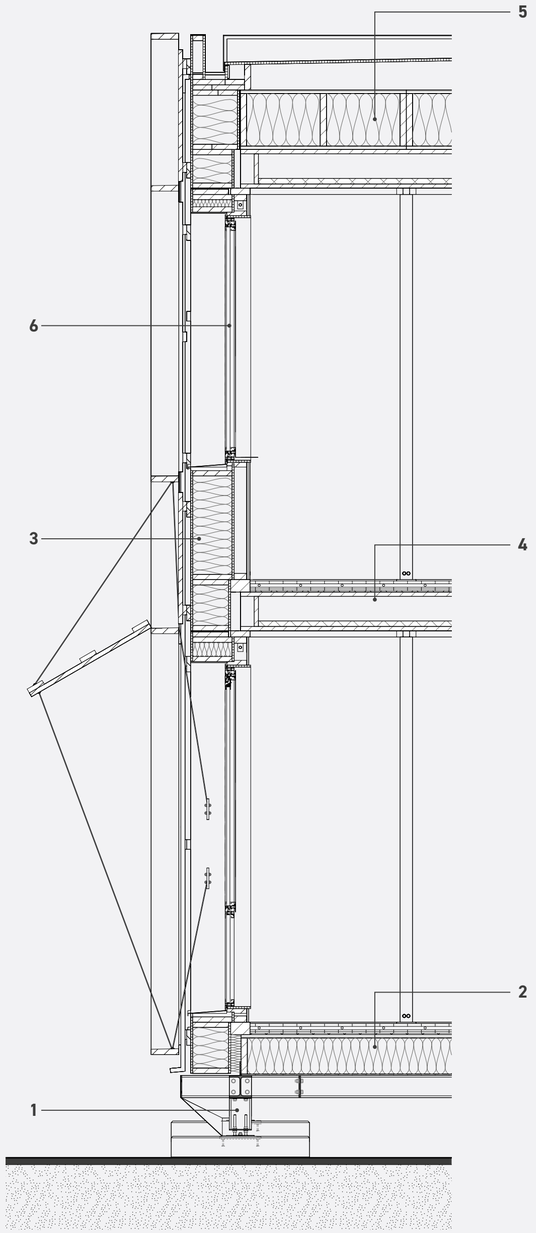


Central Heart

Materials



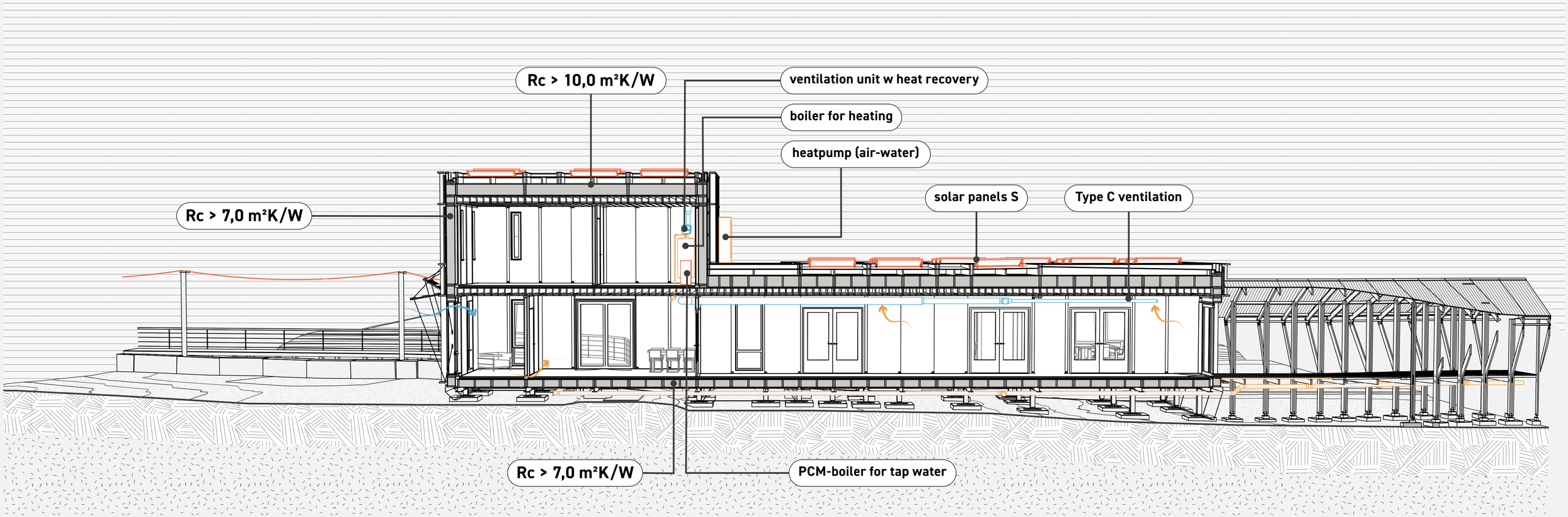
Facade
Scale 1:20



Section
Scale 1:20

Central Heart

Climate





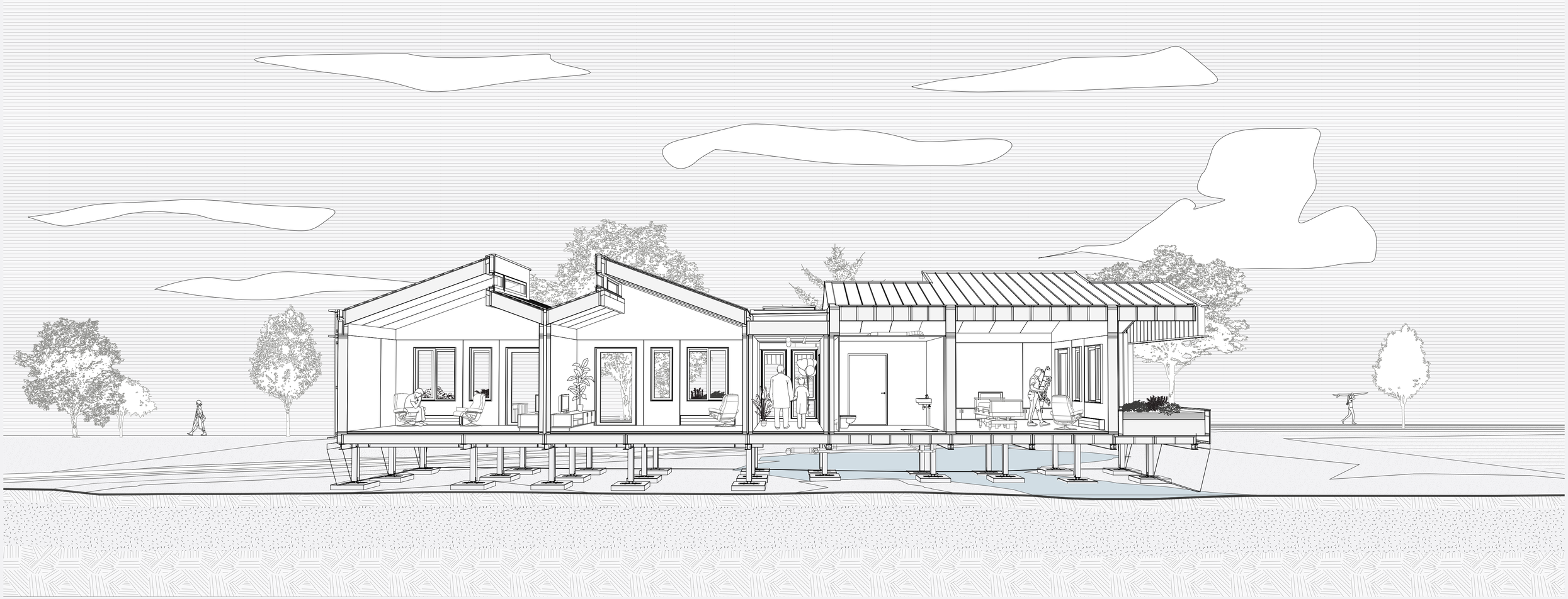
Hospice rooms

Ground floor



Hospice rooms

Section



Hospice rooms

Typical dwelling



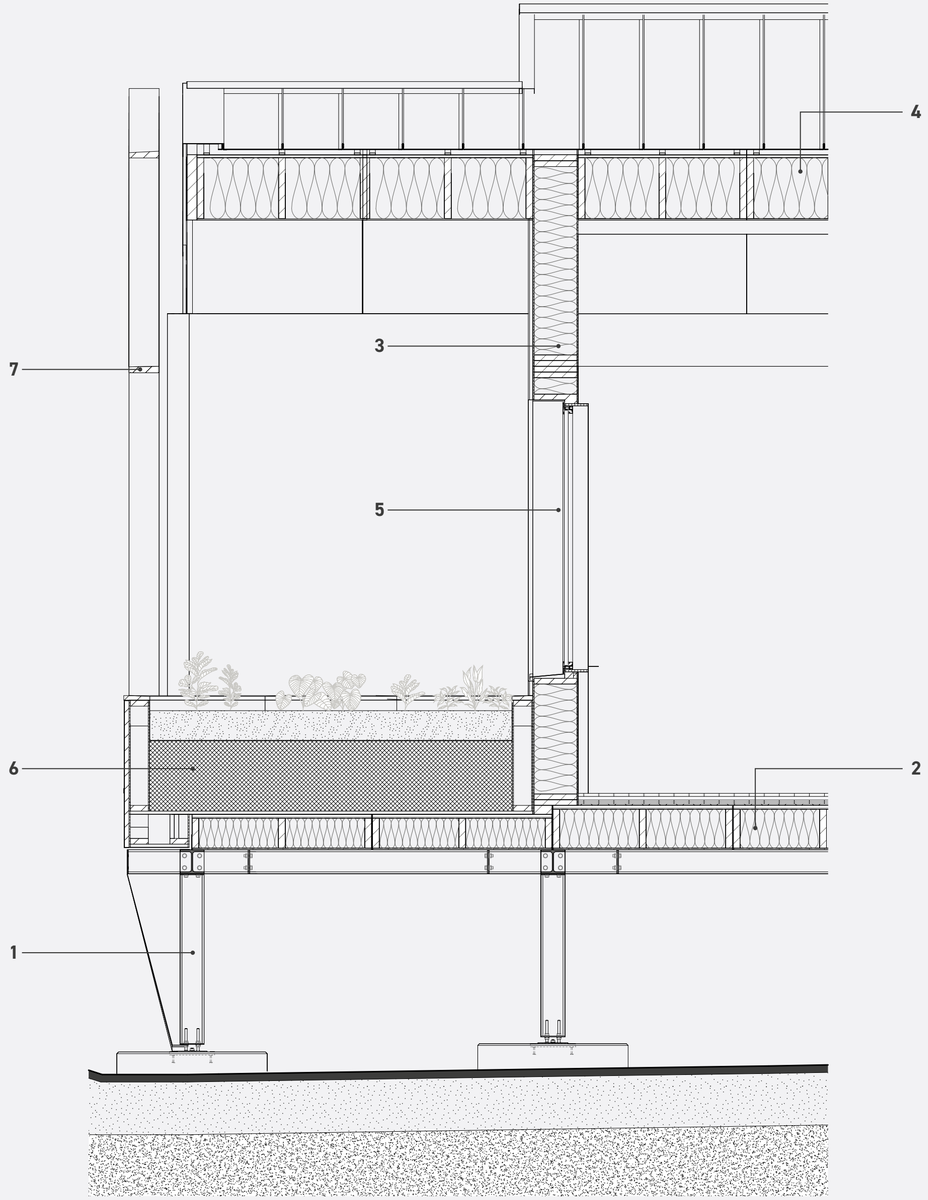


Hospice rooms

Materials



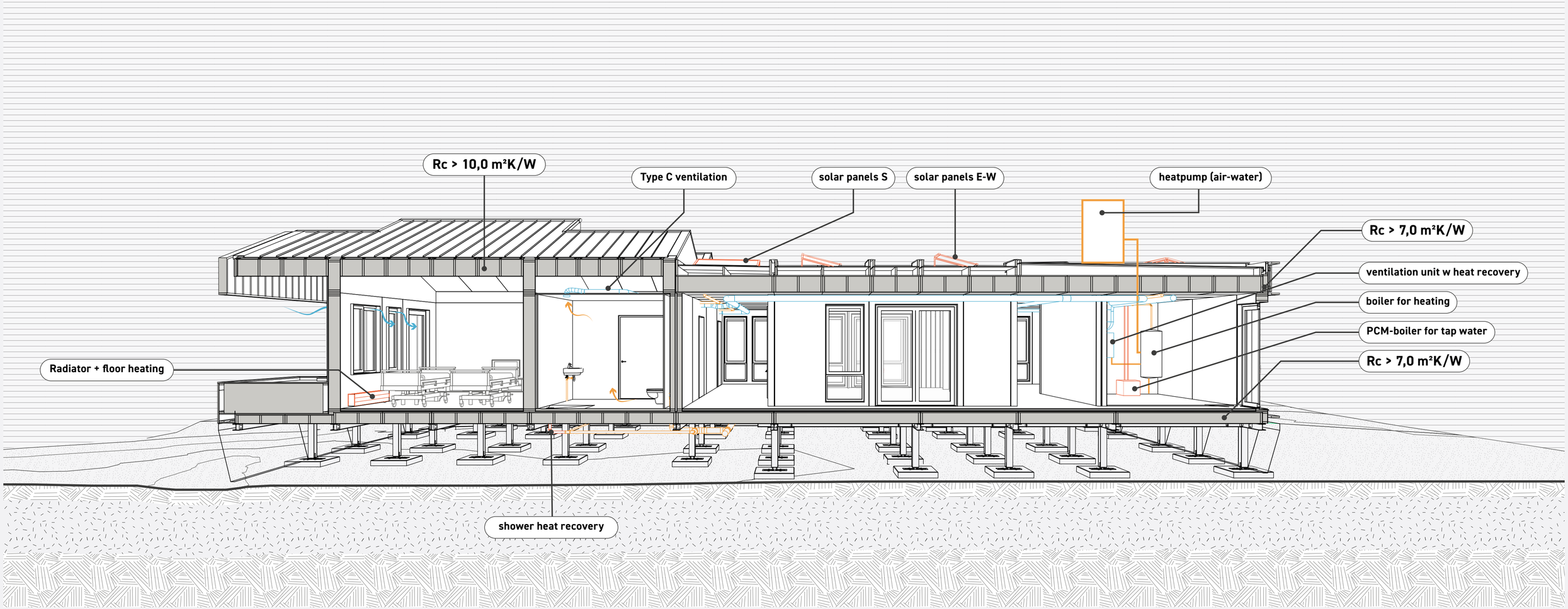
Facade
Scale 1:20



Section
Scale 1:20

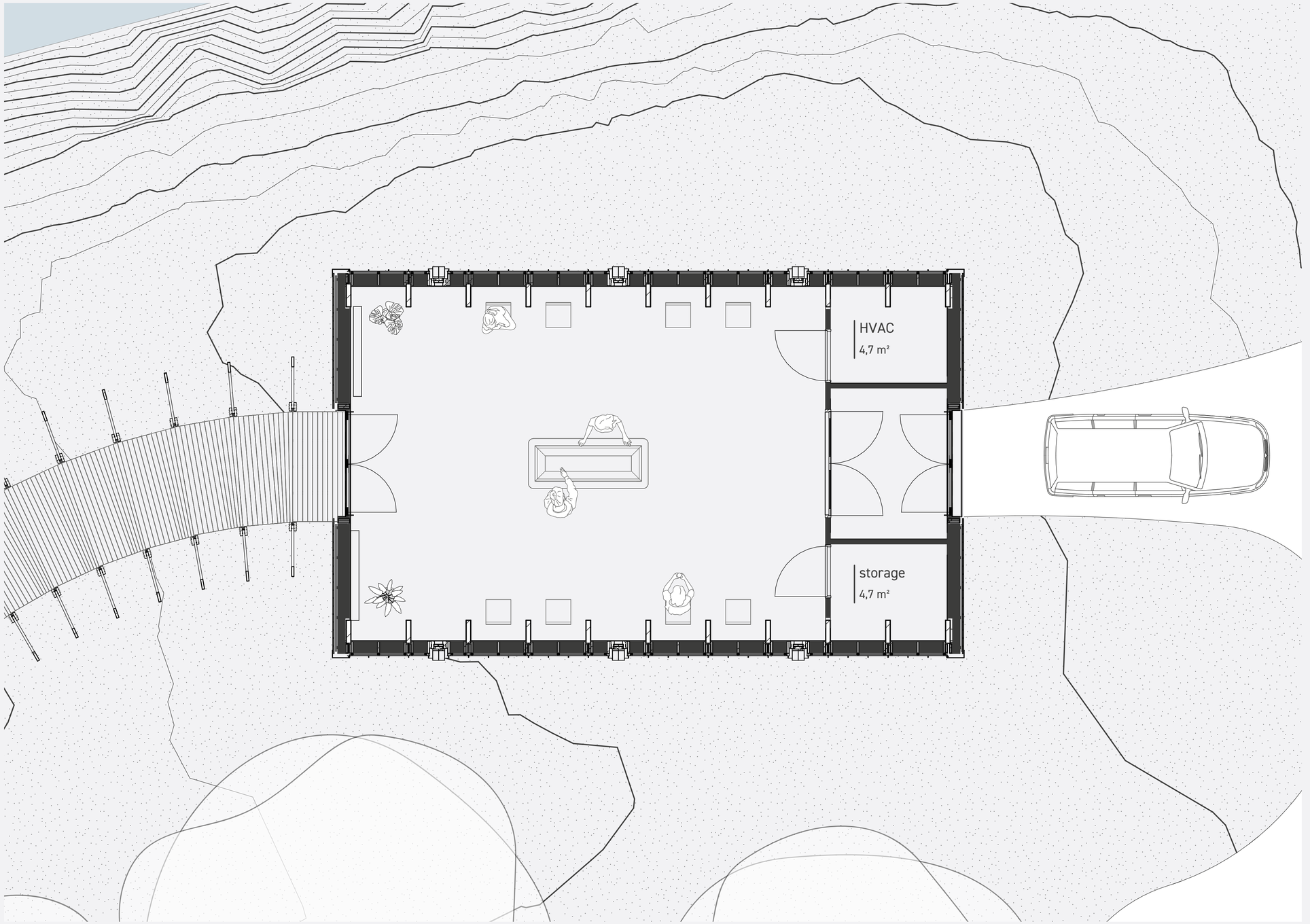
Hospice rooms

Climate



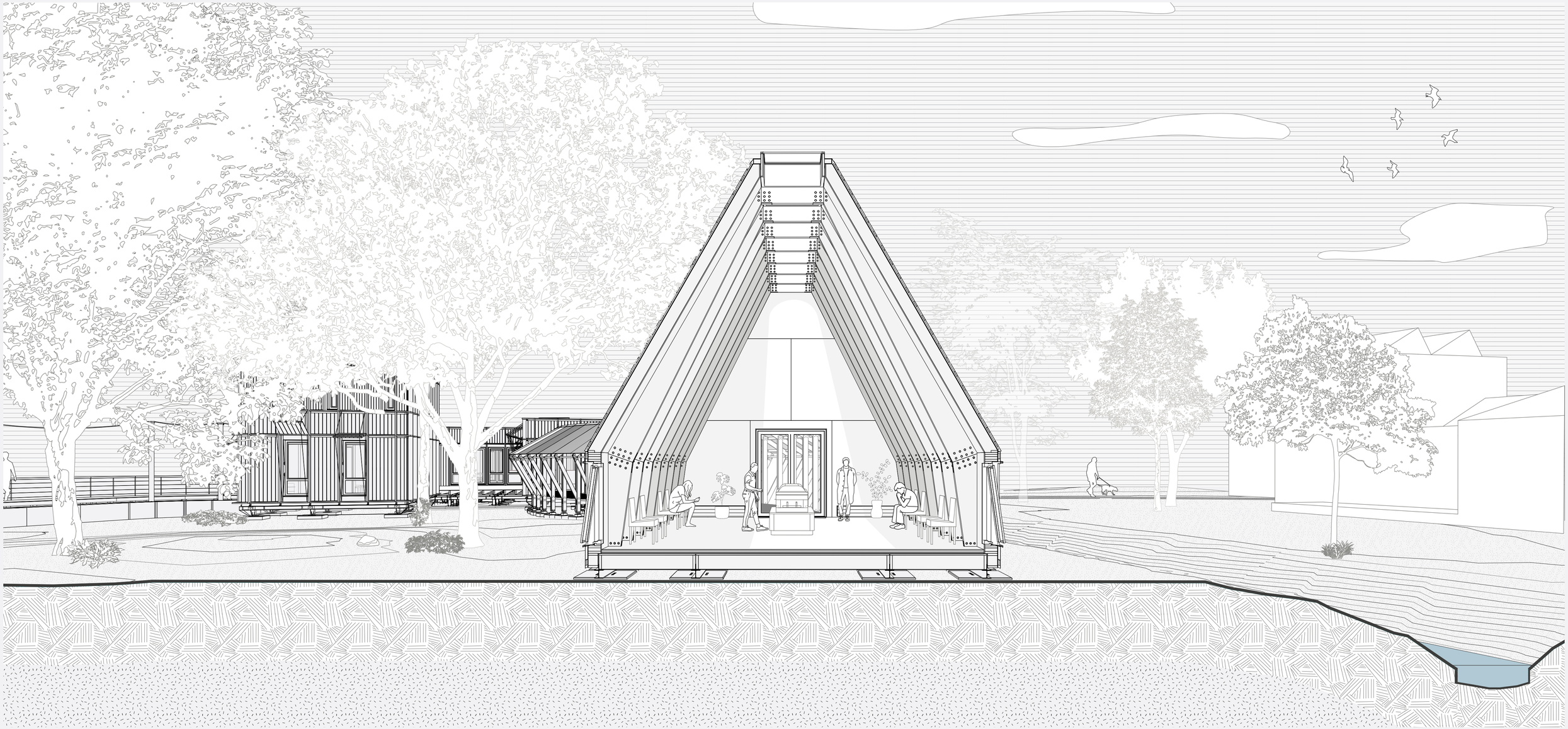
Ritual Space

Ground floor



Ritual Space

Section

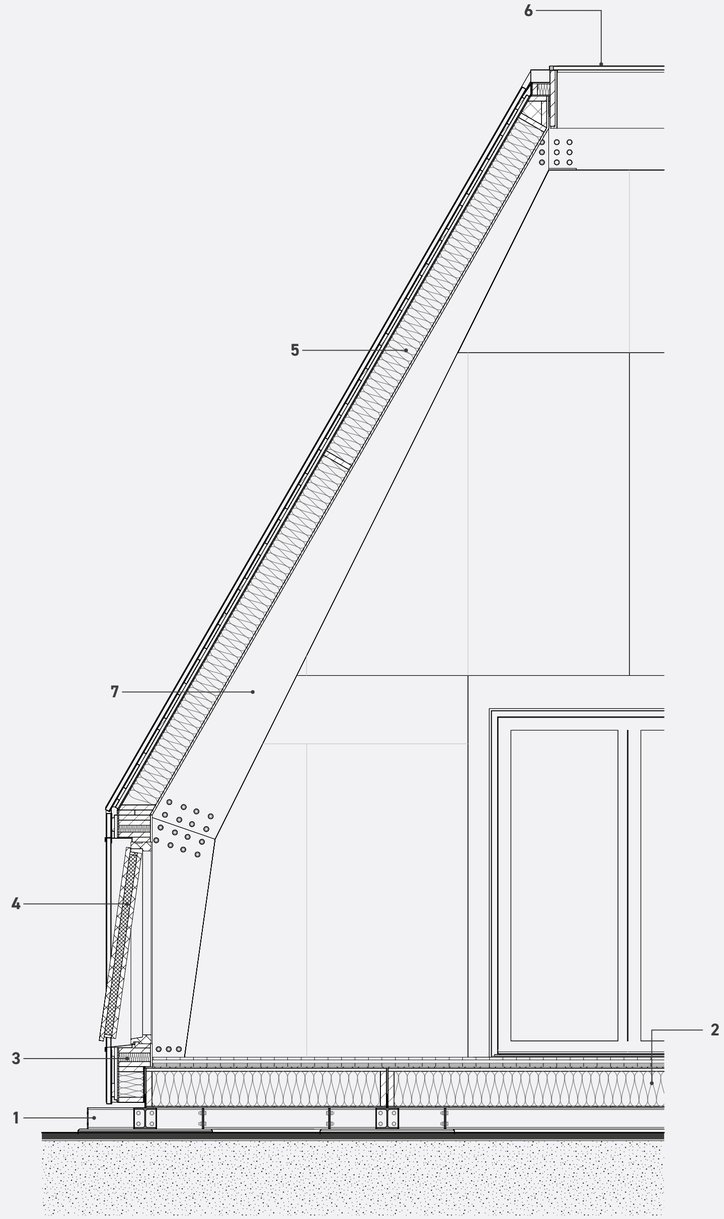


Ritual space

Materials



Facade
Scale 1:20

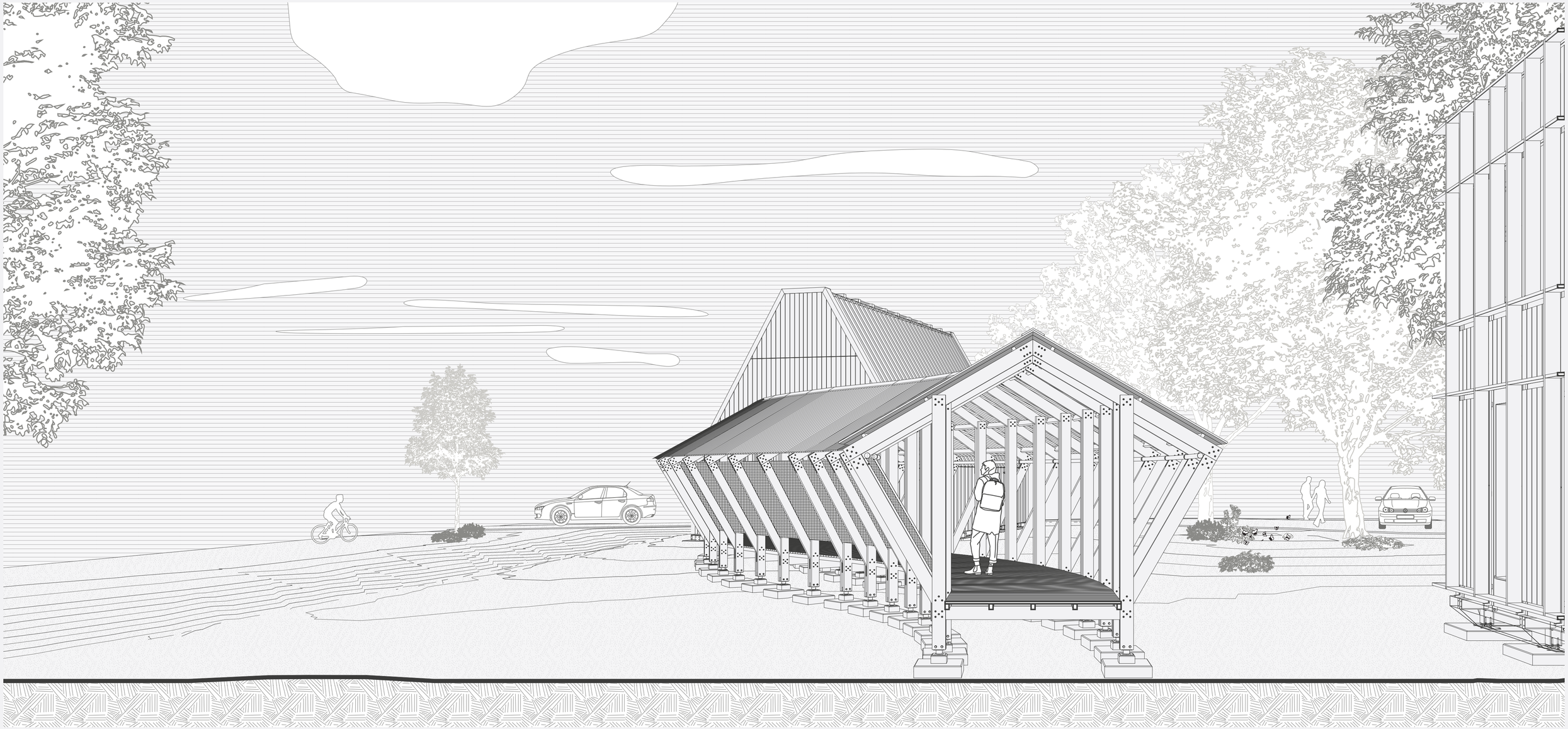


Section
Scale 1:20



Corridor

Section

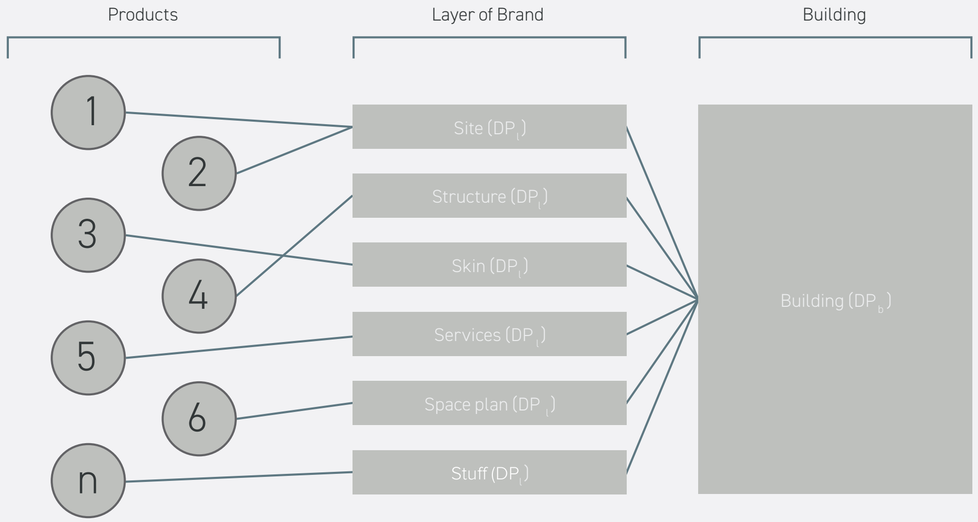






Measuring demountability





Connection accessibility (CA)	Score
Freely accessible without additional actions	1.00
Accessible with additional actions that do not cause damage	0.80
Accessible with additional actions with fully repairable damage	0.60
Accessible with additional actions with partially repairable damage	0.40
Not accessible - irreparable damage to the product or surrounding products	0.10

Independency (ID)	Score
No independency - modular zoning of products or elements from different layers.	1.00
Occasional independency of products or elements from different layers.	0.40
Full integration of products or elements from different layers.	0.10

Geometry of product edge (GPE)	Score
Open, no obstacle to the (interim) removal of products or elements.	1.00
Overlapping, partial obstruction to the (interim) removal of products or elements.	0.40
Closed, complete obstruction to the (interim) removal of products or elements.	0.10

Connection type (CT)		Score
Dry connection	Loose (no fastening material)	1,00
	Click connection	
	Velcro connection	
	Magnetic connection	1.00
Connection with added elements*	Bolt and nut connection	0,80
	Spring connection	
	Corner connections	
	Screw connection	
	Connections with added connection elements**	
Direct integral connection	Pin connections***	0,60***
	Nail connection	
Soft chemical connection	Caulking connection	0,20
	Foam connection (PUR)	
Hard chemical connection	Adhesive connection	0,10
	Dump connection	
	Weld connection	
	Cementitious connection	
	Chemical anchors	
	Hard chemical connection	

Disassembly potential of composition

$$DPcp_n = \frac{2}{\frac{1}{ID_n} + \frac{1}{GPE_n}}$$

Where:
$DPcp_n$ = disassembly potential of the composition of element n:
ID_n = independency of product or element n;
GPE_n = product edge geometry of product or element n

Disassembly potential of connection

$$DPc_n = \frac{2}{\frac{1}{CT_n} + \frac{1}{CA_n}}$$

Where:
DPc_n = disassembly potential of the connection of n product or element n:
CT_n = type of connection of product or element n;
CA_n = accessibility connection of product or element n.

Disassembly potential of product or element

$$DPp_n = \frac{2}{\frac{1}{DPc_n} + \frac{1}{DPcp_n}}$$

Where:
DPp_n = disassembly potential of product or element n.
DPc_n = disassembly potential of the connection of product or element n.
$DPcp_n$ = disassembly potential of the composition of product or element n.

Disassembly potential per layer of Brand

$$DPl_n = \frac{1}{\sum_{i=1}^{i} ECI_n} \cdot \sum_{i=1}^{i} ECI_n \cdot DPp_n$$

Where:
DPl_n = disassembly potential of a Layer of Brand n;
DPp_n = disassembly potential of product or element n;
ECI_n = Environmental Cost Indicator of product or element n.

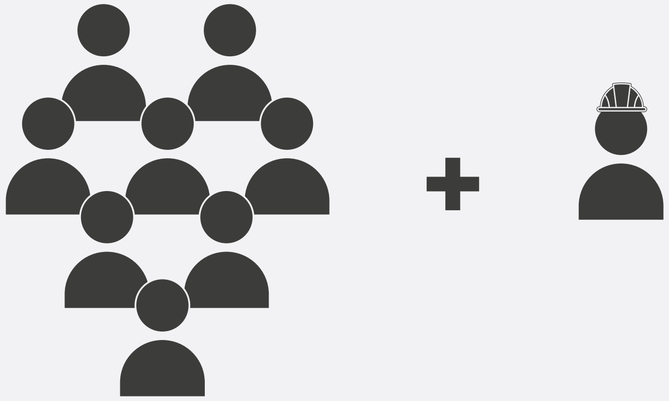
Disassembly potential of building

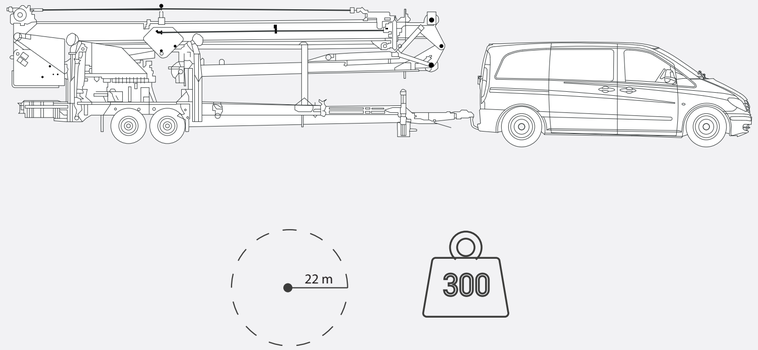
$$DPb_n = \frac{1}{\sum_{i=1}^{i} ECI_n} \cdot \sum_{i=1}^{n} ECI_n \cdot DPp_n$$

Where:
DPb_n = disassembly potential of building n;
DPp_n = disassembly potential of product or element n;
ECI_n = Environmental Cost Indicator of product or element n.

Building demountable

- Within the constraints of the builders
- Measured by the formula



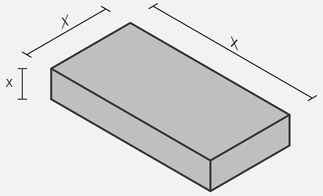




weight



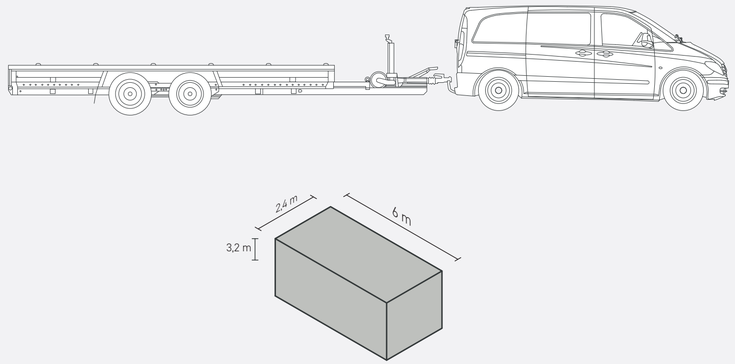
simplicity



dimensions

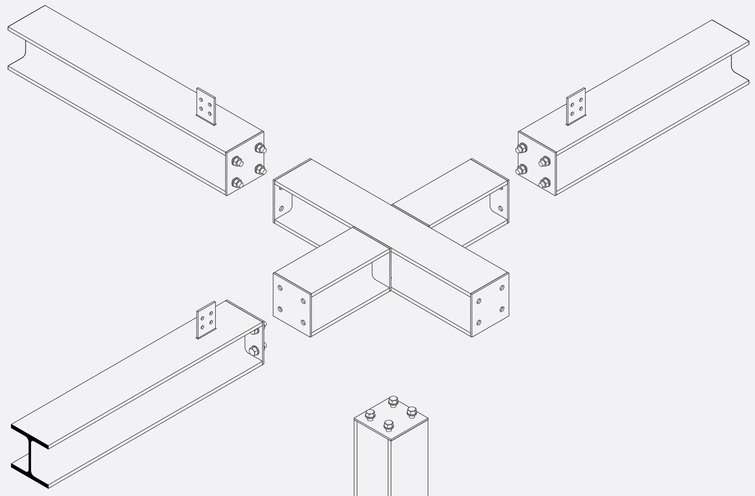


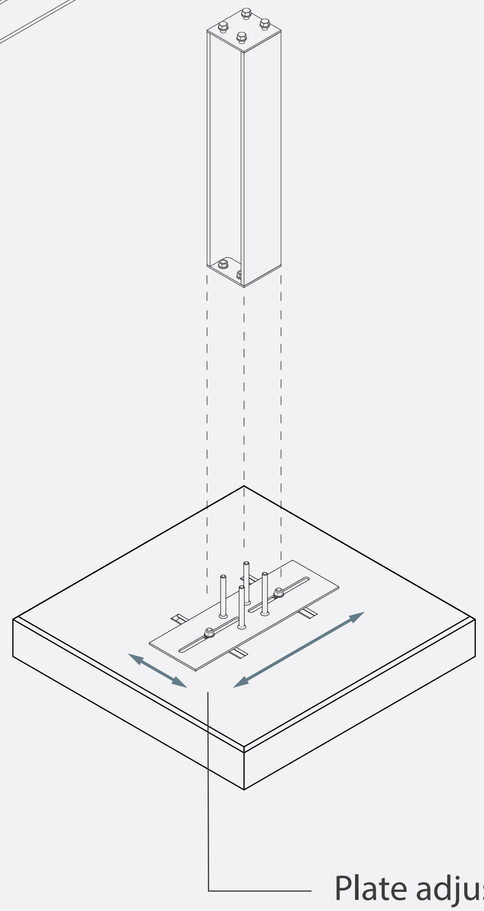
accessibility

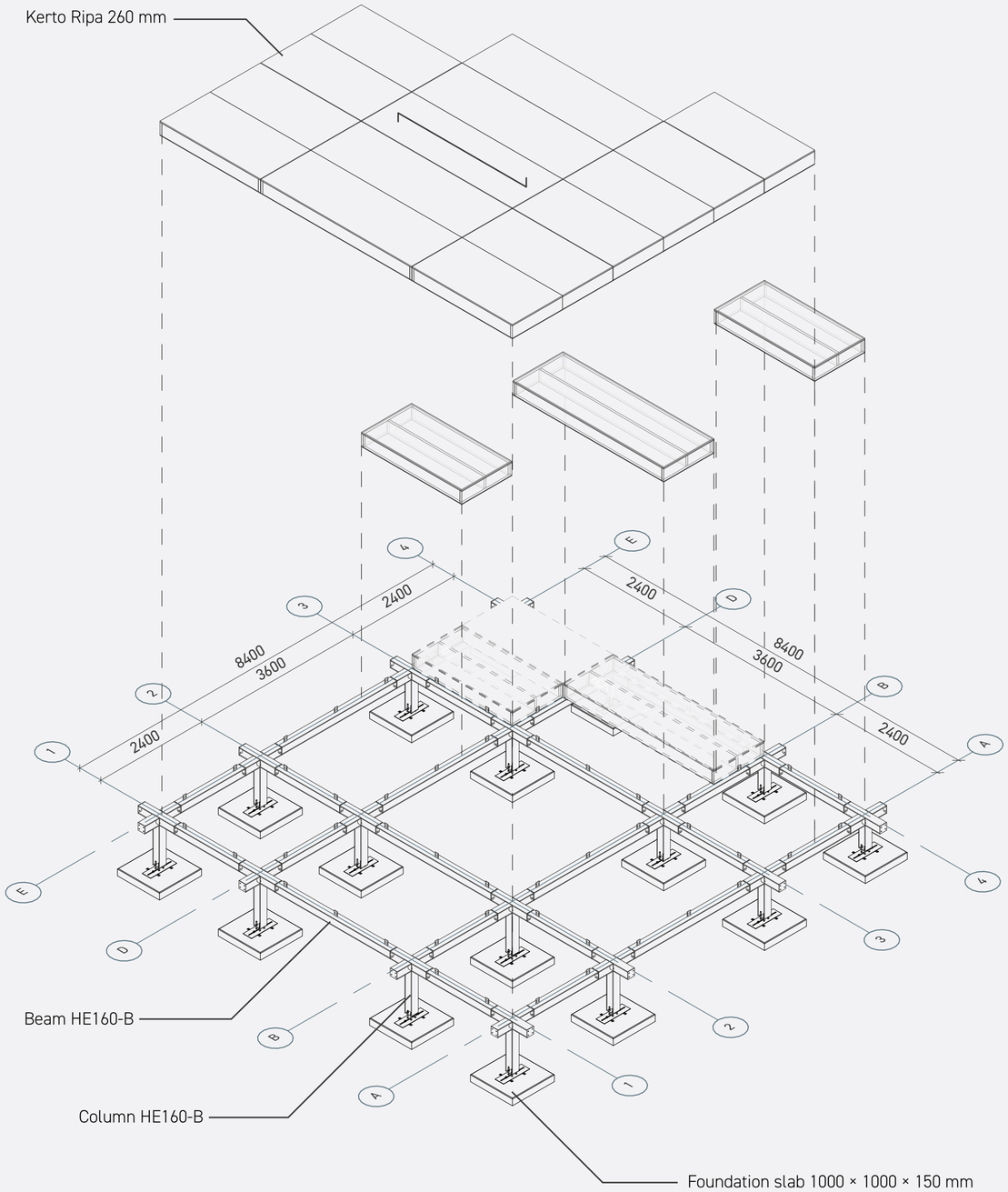


Structure

Foundation platform

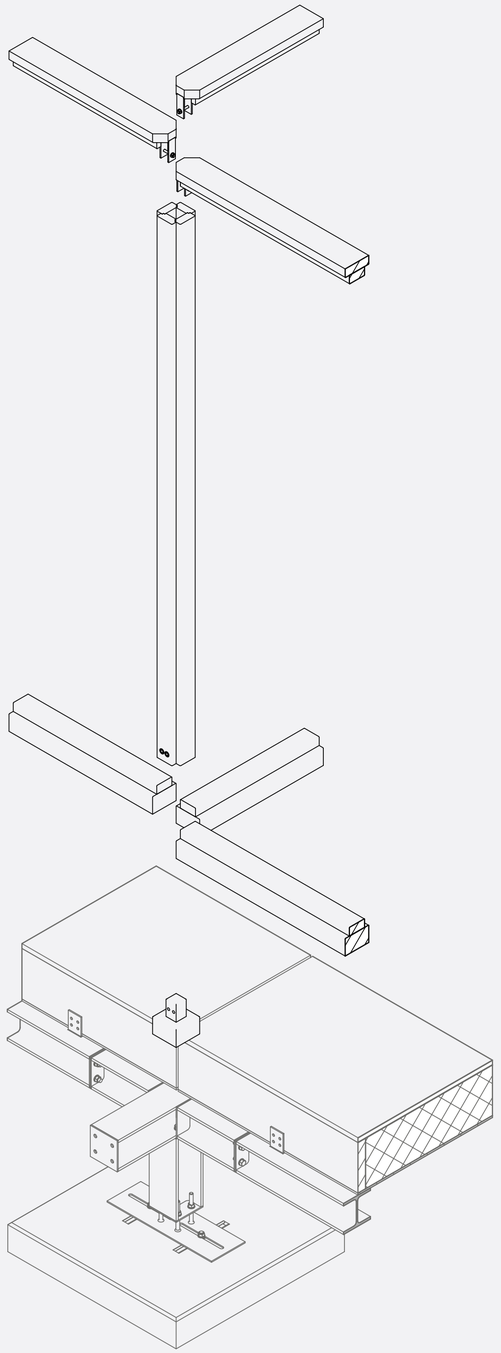


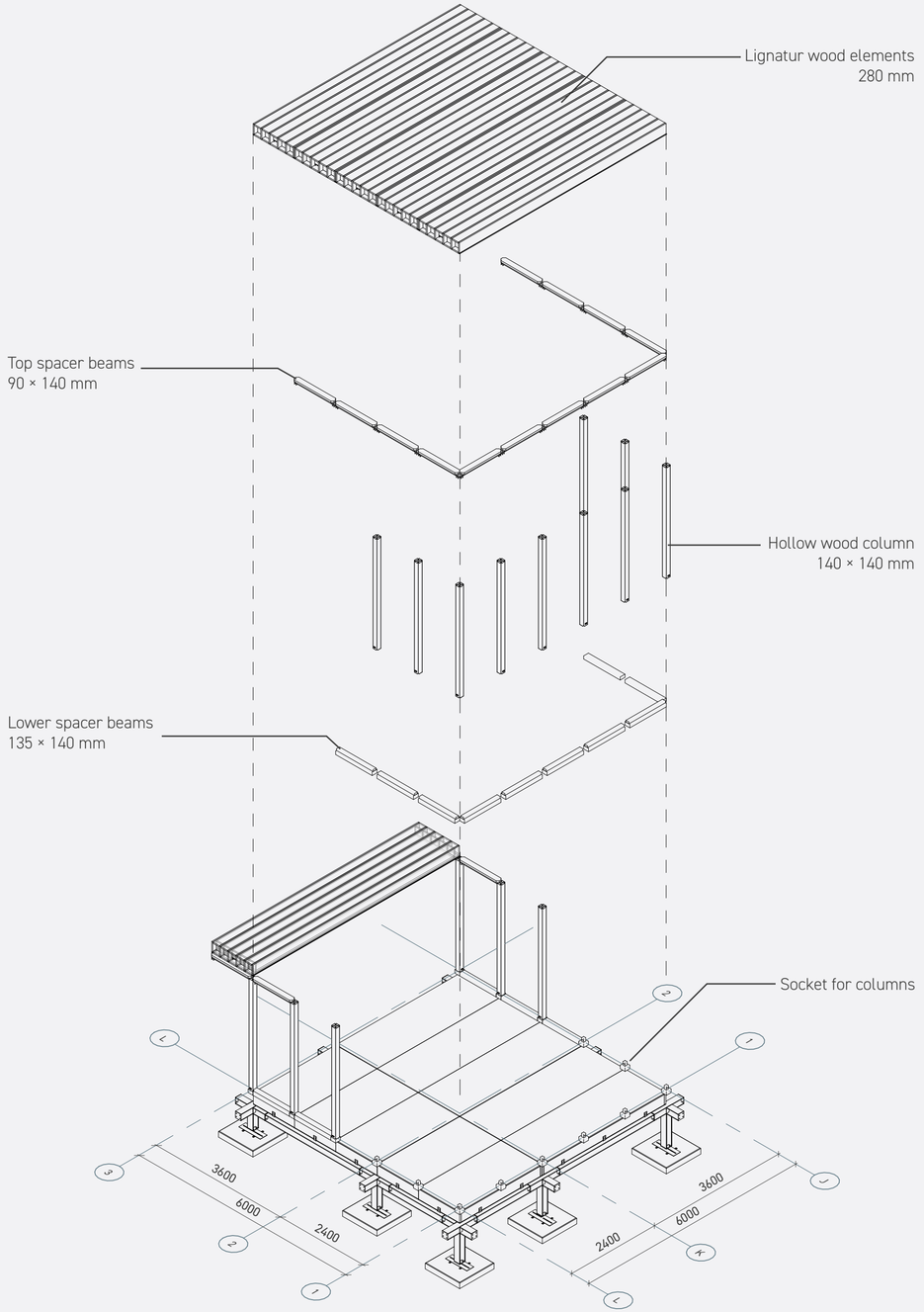




Central Heart

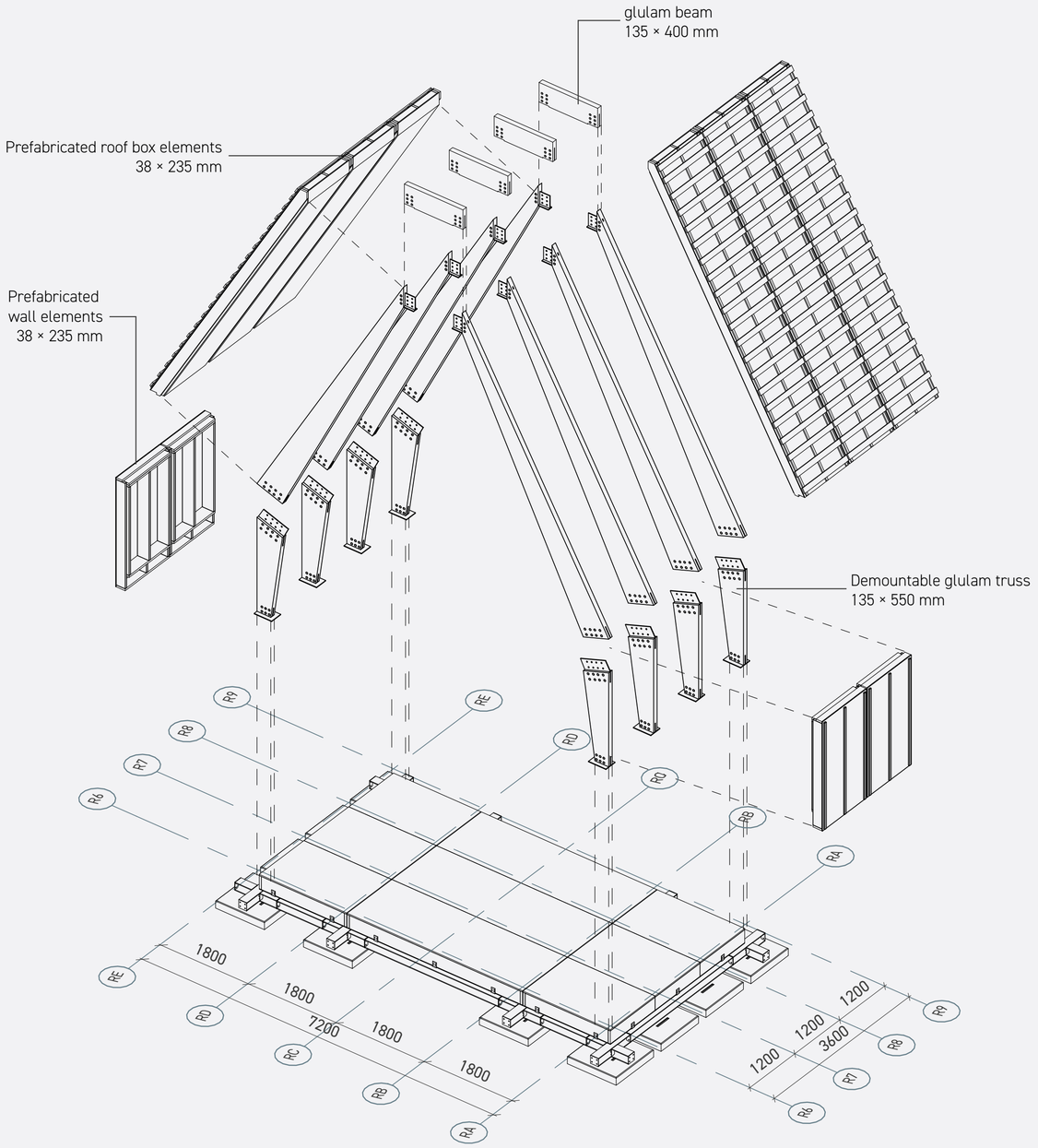
Structure

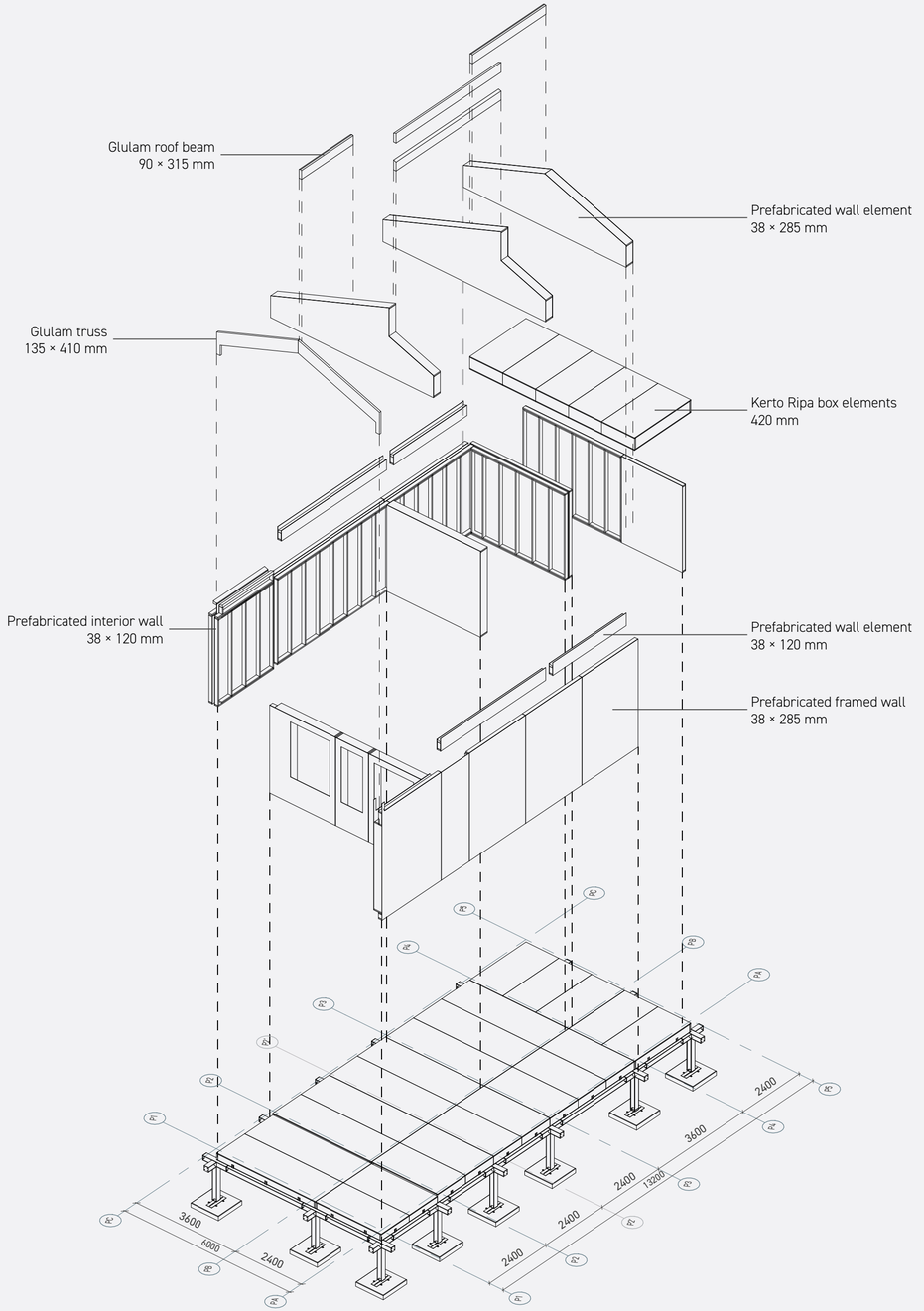


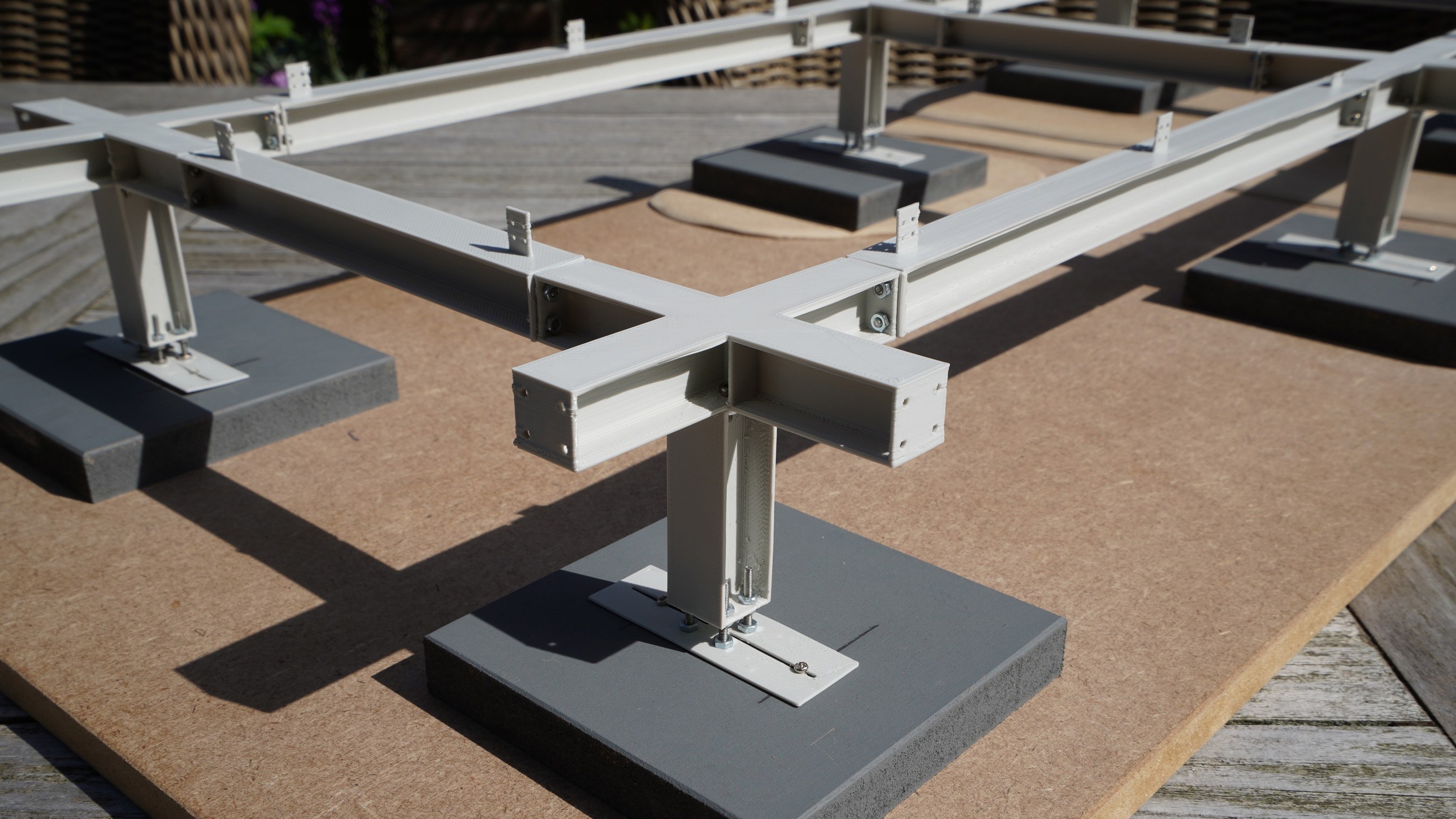


Hospice rooms & Ritual space

Structure

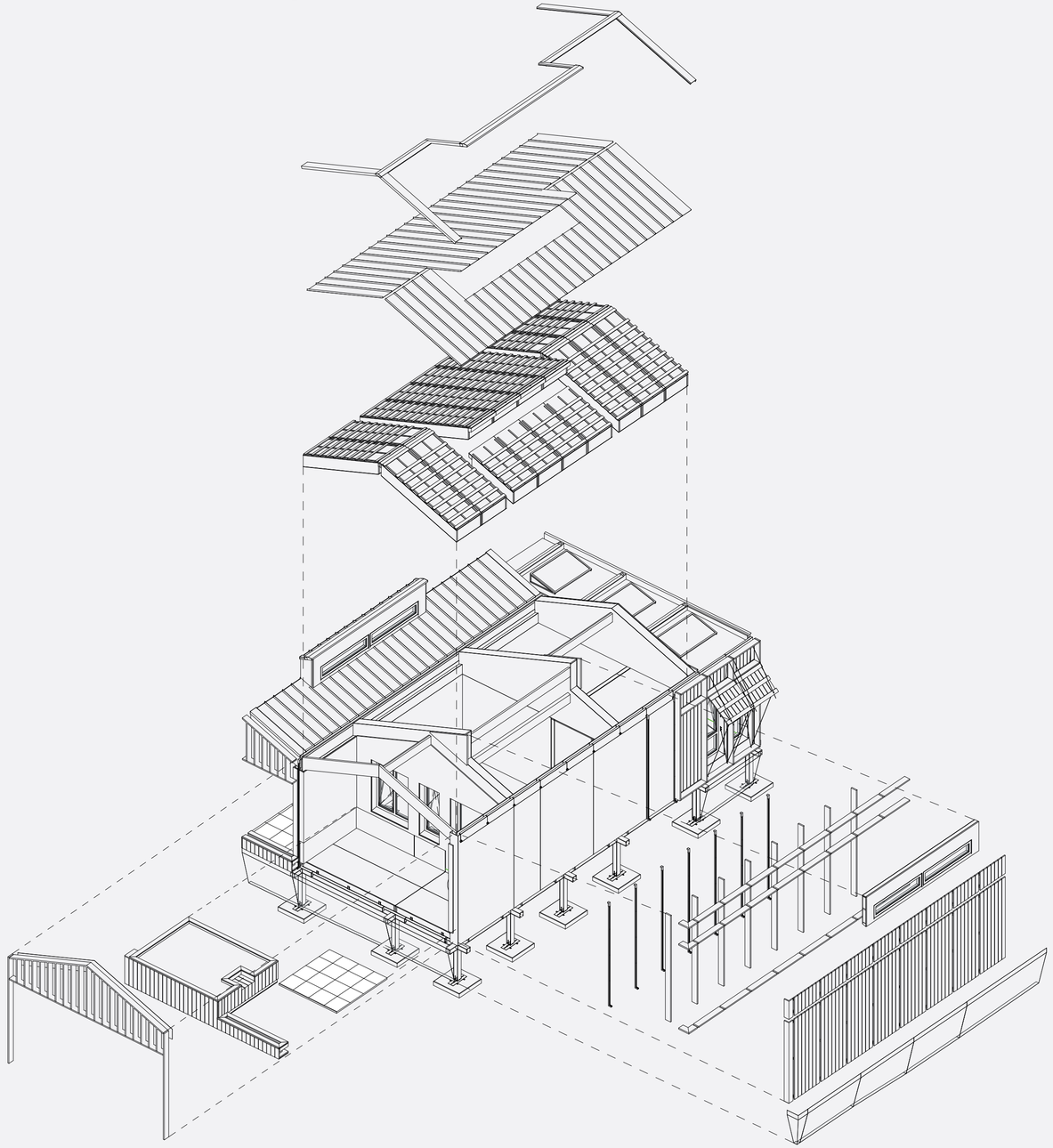


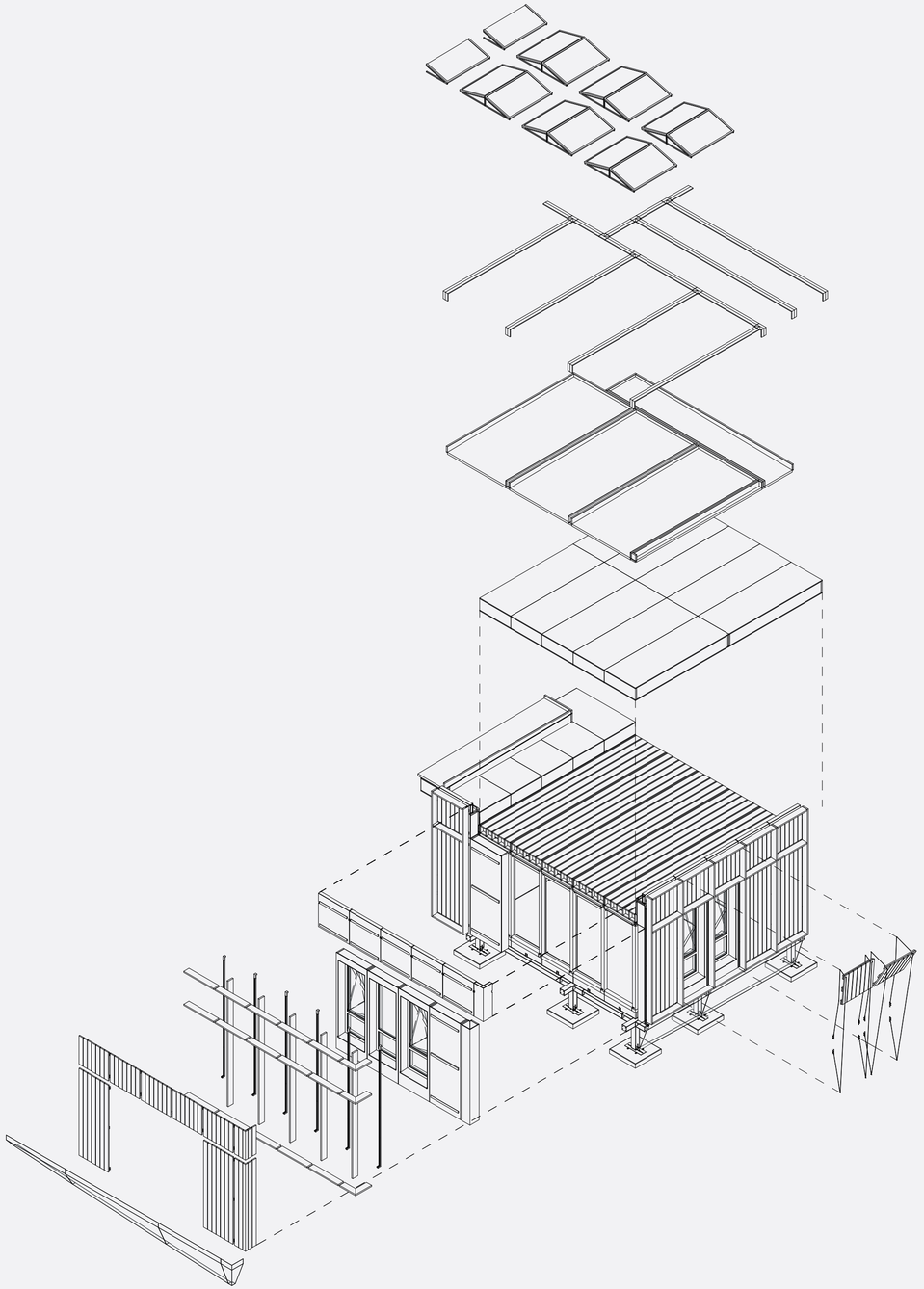




Central Heart & Hospice rooms

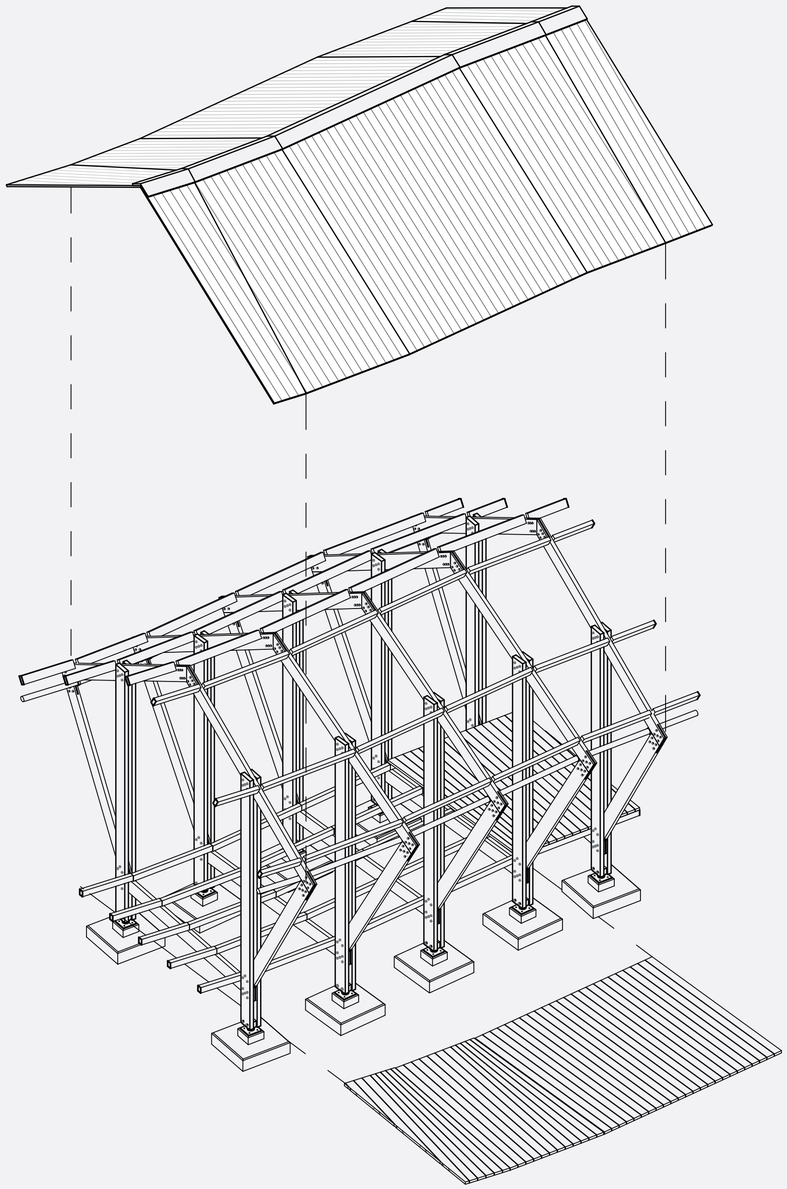
Skin

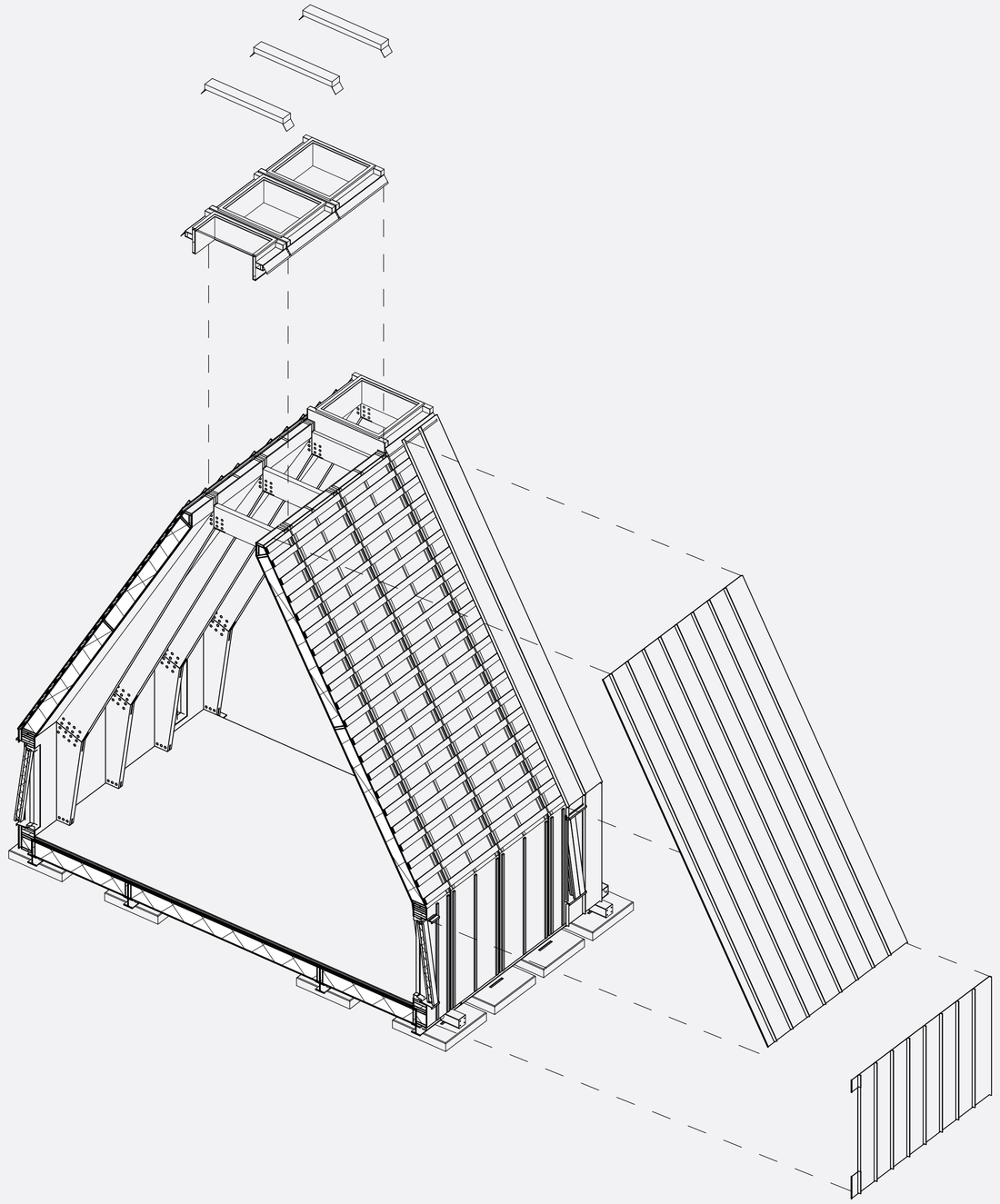




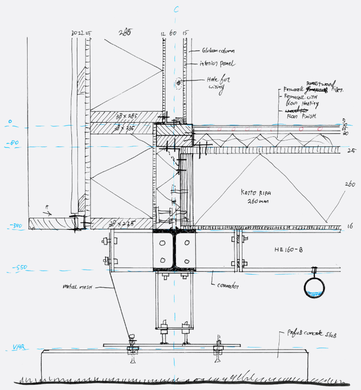
Ritual space & Corridor

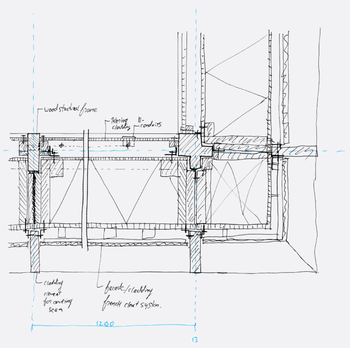
Skin

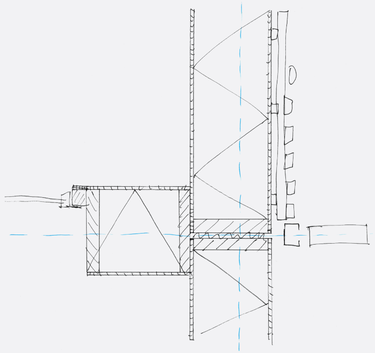


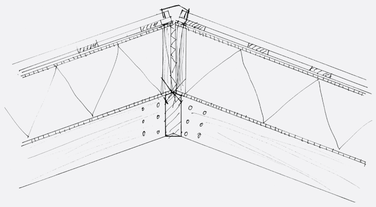


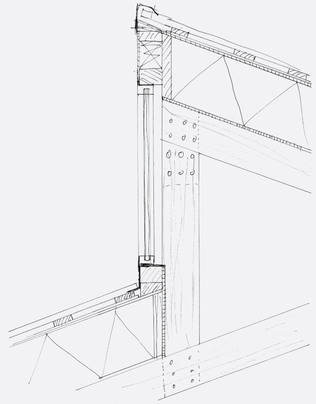
Details, details, details

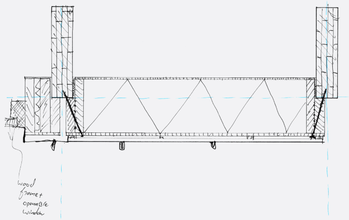


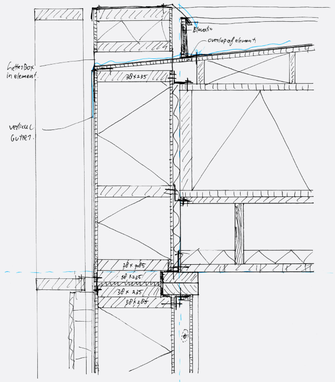


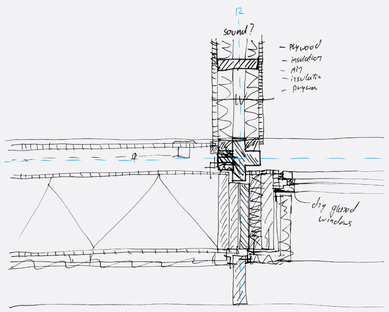


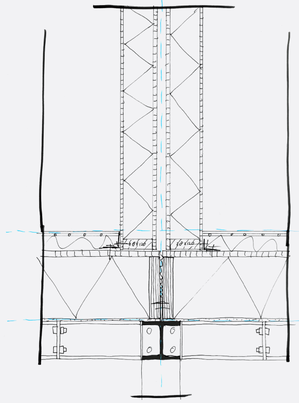


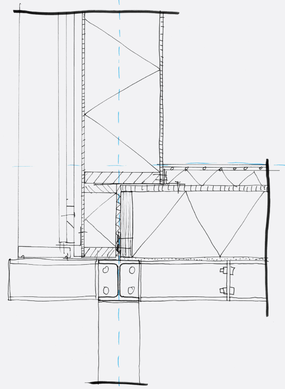


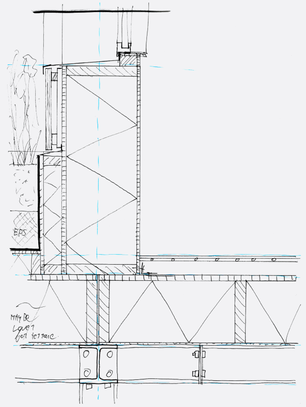


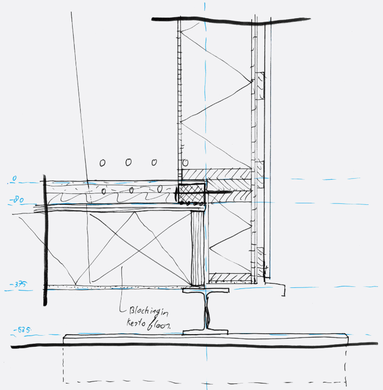


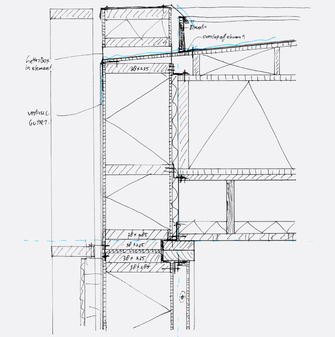


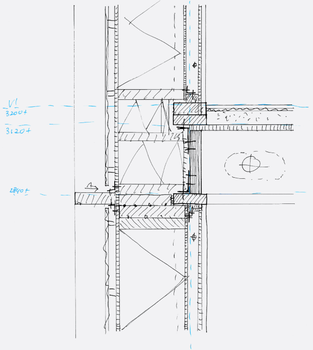


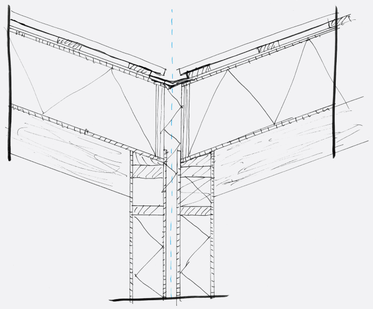


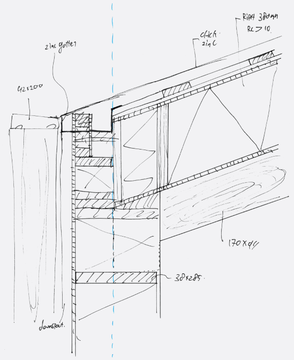


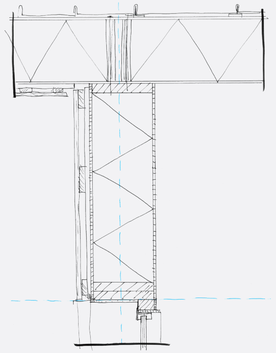


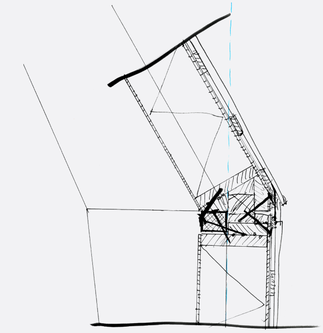






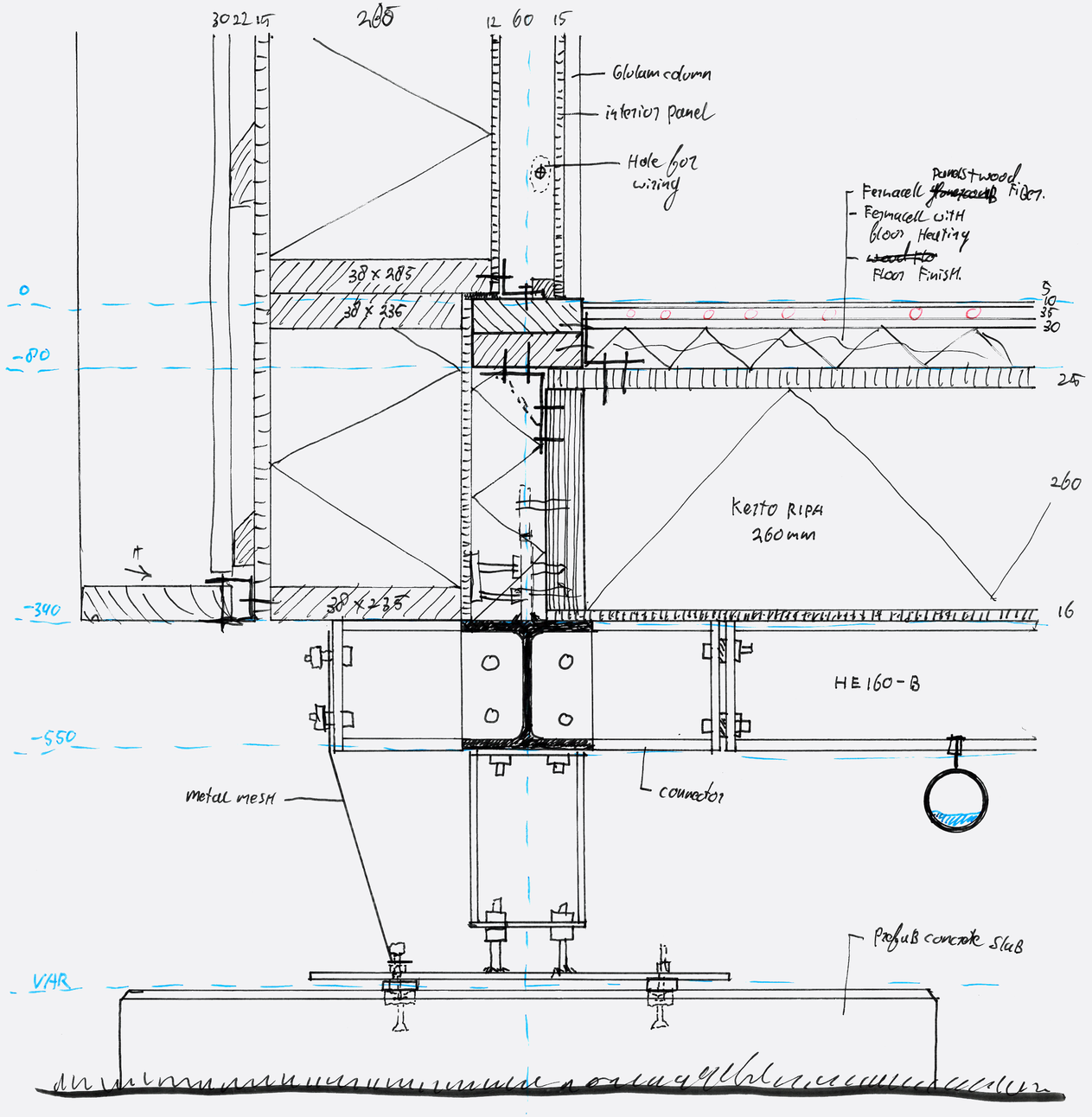






Central Heart

Example detail

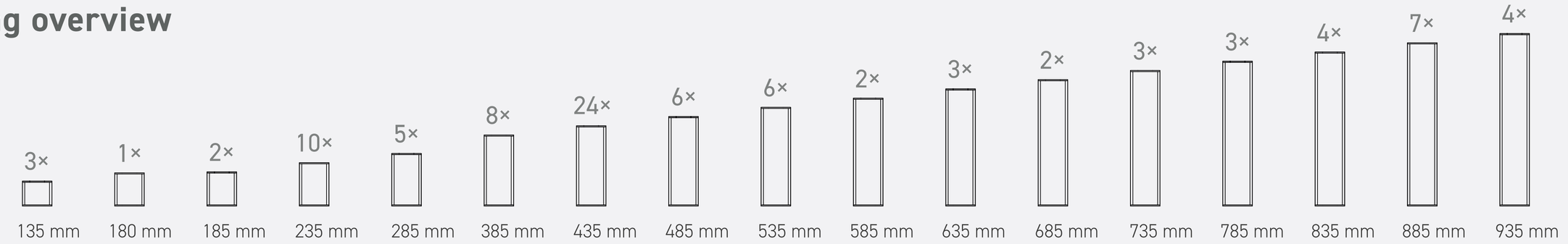


element | detail data			
project:	hospitable movement	detail:	CH V.04
project nr.:	AHD-24	version:	2.1
date:	18-4-2024		

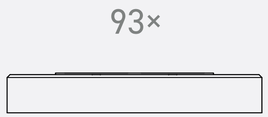
ID	Description	CT	CA	DPc	ID	GPE	DPcp	DP
Structure				**0,85**			**0,76**	**0,78**
1.1	Precast foundation plate 100 × 100 × 15 cm	1,00	0,80		1,00	1,00		0,94
1.2	Adjustable column HE14-A	0,80	1,00		1,00	1,00		0,94
1.3	Steel beam HE160-B	0,80	1,00		1,00	1,00		0,94
1.4	Prefab Wood Kerto floor 260 mm	0,80	0,80		0,40	1,00		0,67
1.5	Glulam floorbeam	0,80	0,80		1,00	0,40		0,67
1.6	Glulam column	0,80	0,80		0,40	0,40		0,53
Skin				**0,85**			**1,00**	**0,92**
2.1	Prefabricated insulated framed panels	0,80	0,80		1,00	1,00		0,89
2.2	aesthetical wood frame	0,80	0,80		1,00	1,00		0,89
2.3	Cladding	0,80	1,00		1,00	1,00		0,94
2.4	Metal mesh for foundation	0,80	1,00		1,00	1,00		0,94
2.5								
2.6								
Services				**0,86**			**0,71**	**0,76**
3.1	Electricity wiring	1,00	0,80		1,00	0,40		0,69
3.2	Floor heating	1,00	0,80		1,00	0,40		0,69
3.3	Sewer pipe	0,80	0,80		1,00	1,00		0,89
3.4								
3.5								
3.6								
Space plan							**0,80**	**0,83**
4.1	Floating screed floor	1,00	0,80		0,40	0,40		0,55
4.2	Floor finish	1,00	1,00		1,00	1,00		1,00
4.3	Interior plywood cladding	0,80	1,00		1,00	1,00		0,94
4.4								
4.5								
4.6								
Total				**0,85**			**0,82**	**0,82**

Building overview

List of parts



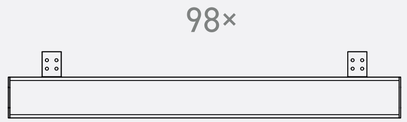
Foundation columns
HE160-B



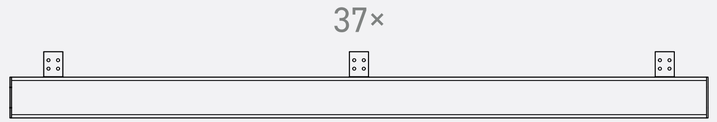
Prefabricated concrete slab
1000 × 1000 × 150 mm



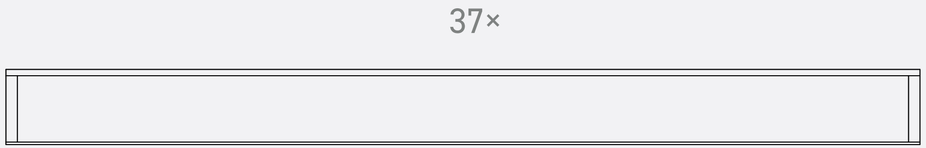
Steel crosslink
HE160-B



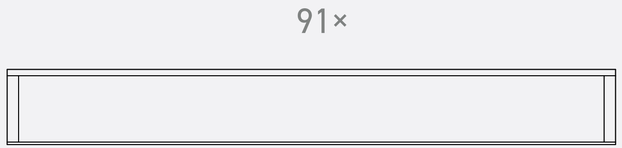
HE160-B beam
1540 mm



HE160-B beam
2740 mm



Kerto Ripa floor element 260 mm
3600 mm



Kerto Ripa floor element 260 mm
2400 mm

Calculation

Project data	
project name:	Hospitable Movement
project number:	AHD-24
client:	Hospice Vlaardingen
adress:	Vlietskade 1, Vlaardingen
Building part:	Central heart
version:	1.0
version date:	24-5-2024
calculated by:	J. (Jasper) Sterrenburg

Summary		
disassembly potential	**ECI**	**DP**
building	**5513,13**	**0,89**
structure	2332,29	0,91
skin	2017,22	0,94
services	305,38	0,60
space plan	858,24	0,80

ID	product/element description	ID load-bearing connection	Load-bearing connection	ECI	CT	CA	disassembly potential of the connection (DPc)	ID	GPE	Disassembly potential of the composition (DPcp)	disassembly potential (DP)
1.0	**Structure**			**2332,29**			**0,94**			**0,9**	**0,91**
1.1	Precast foundation plate 100 × 100 × 15 cm			1050,44	1,00	1,00	1	1,00	1,00	1	1
1.2	Steel column HE160-B	1.1	Precast foundation plate 100 × 100 × 15 cm	73,24	0,80	1,00	0,89	1,00	1,00	1	0,94
1.3	Steel crossjoint HE160-B	1.2	Steel column HE160-B	251,14	0,80	1,00	0,89	1,00	1,00	1	0,94
1.4	Steel beam HE160-B	1.3	Steel crossjoint HE160-B	399,31	0,80	1,00	0,89	1,00	1,00	1	0,94
1.5	Kerto Ripa ground floor elements	1.4	Steel beam HE160-B	531,26	0,80	1,00	0,89	0,40	1,00	0,57	0,69
1.6	Wood column base elements	1.5	Kerto Ripa ground floor elements	0,02	0,80	1,00	0,89	1,00	1,00	1	0,94
1.7	Wood columns	1.6	Wood column base elements	0,38	0,80	1,00	0,89	0,40	0,40	0,4	0,55
1.8	Floor beam between columns	1.5	Kerto Ripa ground floor elements	0,18	0,80	1,00	0,89	1,00	1,00	1	0,94
1.9	Top beam between columns	1.7	Wood columns	0,13	0,80	1,00	0,89	1,00	1,00	1	0,94
1.10	Lignature roof structure elements	1.9	Top beam between columns	26,19	0,80	1,00	0,89	0,40	1,00	0,57	0,69
2.0	**Skin**			**2017,22**			**0,89**			**1**	**0,94**
2.1	Prefab framed panel (closed)	1.7	Wood columns	352,32	0,80	1,00	0,89	1,00	1,00	1	0,94
2.2	Prefab framed panel (open)	1.7	Wood columns	52,37	0,80	1,00	0,89	1,00	1,00	1	0,94
2.3	Prefab framed top panel	1.10	Lignature roof structure elements	166,07	0,80	1,00	0,89	1,00	1,00	1	0,94
2.4	Zinc downspout	2.1	Prefab framed panel (closed)	422,92	0,80	1,00	0,89	1,00	1,00	1	0,94
2.5	Wood frame on facade	2.1	Prefab framed panel (closed)	80,76	0,80	1,00	0,89	1,00	1,00	1	0,94
2.6	Wood cladding	2.1	Prefab framed panel (closed)	0,82	0,80	1,00	0,89	1,00	1,00	1	0,94
2.7	Sunshading	2.5	Wood frame on facade	0,01	0,80	1,00	0,89	1,00	1,00	1	0,94
2.8	Kerto insulated roof elements	1.10	Lignature roof structure elements	477,55	0,80	1,00	0,89	1,00	1,00	1	0,94
2.9	Roof panels	2.8	Kerto insulated roof elements	464,40	0,80	1,00	0,89	1,00	1,00	1	0,94
2.10											
3.0	**Services**			**305,38**			**0,89**			**0,46**	**0,6**
3.1	Floor heating	4.1	Screed floor (dry system)	197,88	1,00	0,80	0,89	0,40	0,40	0,4	0,55
3.2	Ventilation system	1.10	Lignature roof structure elements	107,50	0,80	1,00	0,89	0,40	1,00	0,57	0,69
3.3											
3.4											
3.5											
3.6											
3.7											
3.8											
3.9											
3.10											
4.0	**Space Plan**			**858,24**			**0,97**			**0,7**	**0,8**
4.1	Screed floor (dry system)	1.5	Kerto Ripa ground floor elements	591,44	1,00	1,00	1	0,40	1,00	0,57	0,73
4.2	Interior wall panels	1.7	Wood columns	266,80	0,80	1,00	0,89	1,00	1,00	1	0,94
4.3											
4.4											
4.5											
4.6											
4.7											
4.8											
4.9											
4.10											

Calculation

Project data	
project name:	Hospitable Movement
project number:	AHD-24
client:	Hospice Vlaardingen
adress:	Vlietskade 1, Vlaardingen
date:	24-5-2024

Cluster Summary								
	central heart		hospice rooms		ritual space		corridors	
	ECI	DP	ECI	DP	ECI	DP	ECI	DP
structure	2.332,29	0,91	3.771,29	0,92	1.192,23	0,94	271,49	1,01
skin	2.017,22	0,94	1.773,64	0,94	475,29	0,94	1.126,14	0,94
services	305,38	0,60	290,75	0,60	64,38	1,00	28,80	0,53
space plan	858,24	0,80	520,66	0,73	247,85	0,84	0,00	0,00
building	5.513,13	0,89	6.356,34	0,90	1.979,75	0,93	1.426,43	0,95

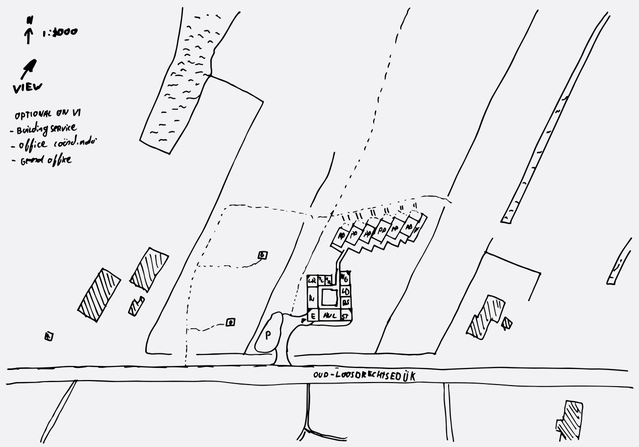
Layer calculation		
Layer	**ECI**	**disassembly potential (DP)**
structure	7.567,30	0,92
skin	5.392,29	0,94
services	689,31	0,63
space plan	1.626,75	0,78

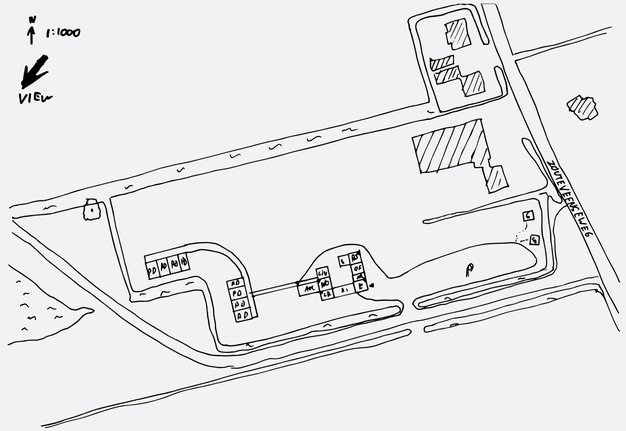
Building disassembly potential		
	ECI	**disassembly potential (DP)**
Building	**15.275,65**	**0,90**



Building Displacement



















HOSPITABLE MOVEMENT

Jasper Sterrenburg - 5653673

Advanced Housing Design

