

# طرب\_Tarab

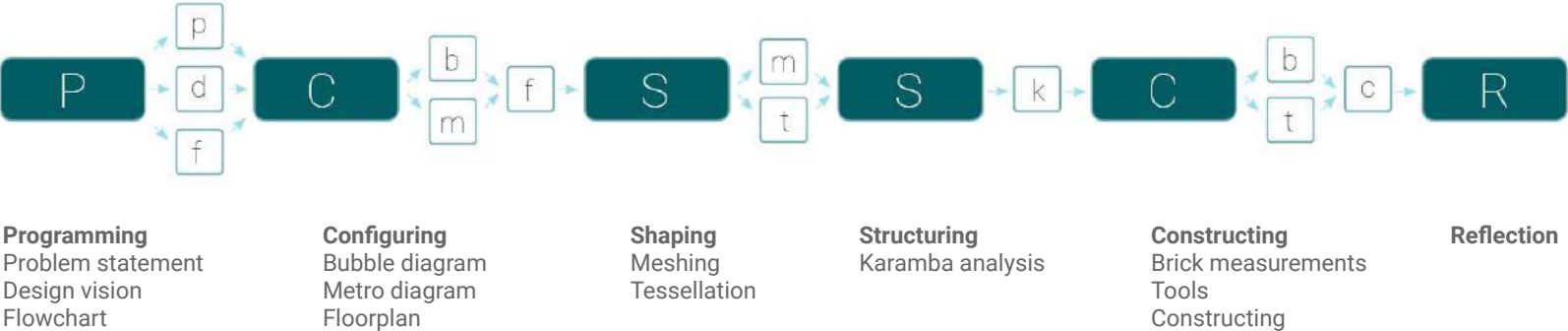
GROUP 5  
Earthy - 2020



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Isidoros Spanolios	4846982
Lama Idrees	5137330

29-10-2020

# Structure of presentation

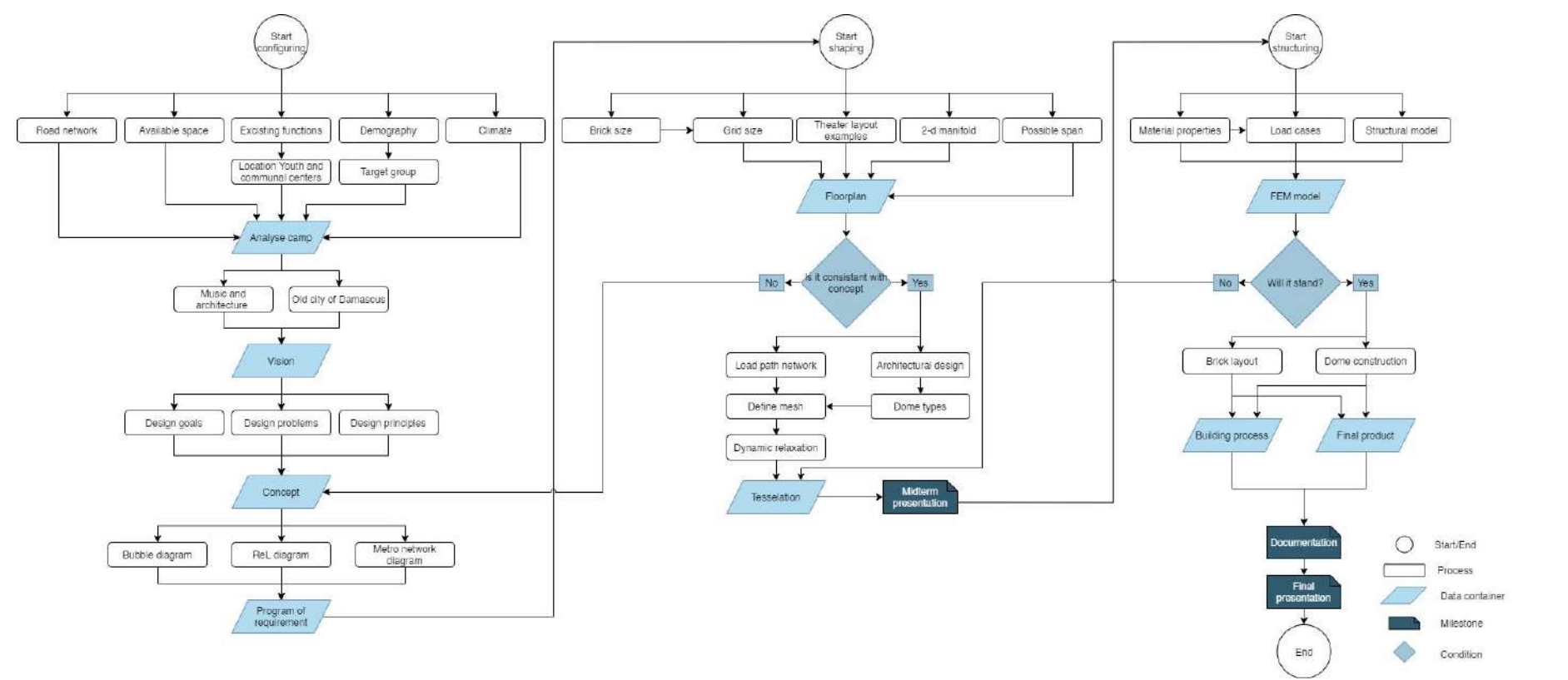


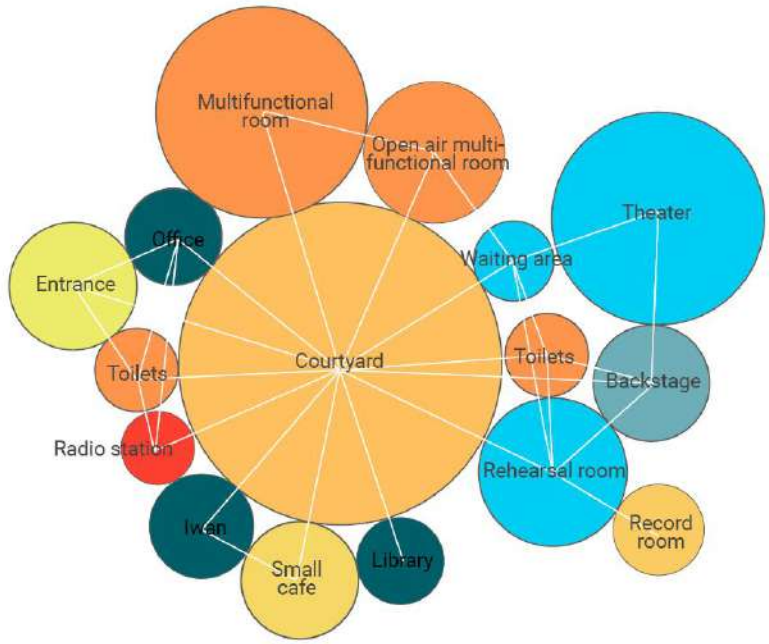
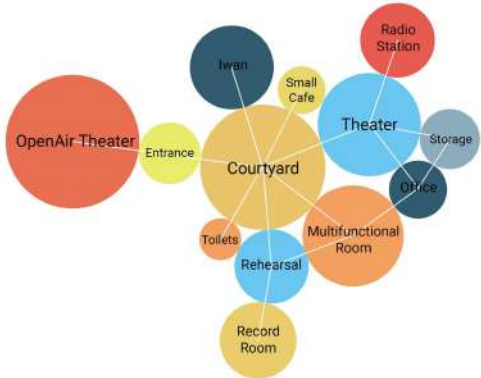
## Problem statement

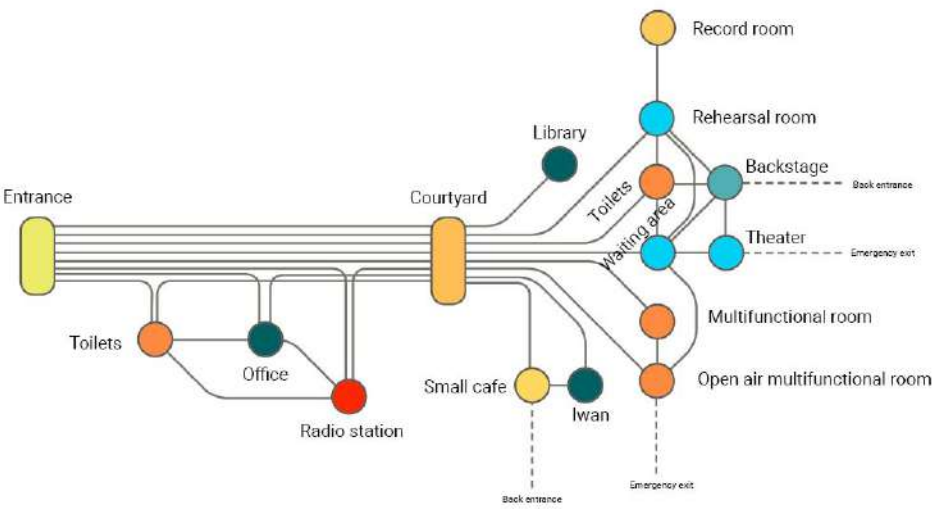
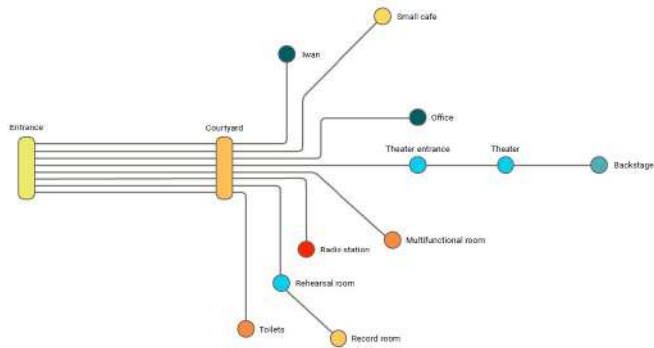
“The Za’atari refugee camp is in size and numbers a city, but not in its functions.”

## Design vision

“Design a safe place for people to enjoy musical and cultural activity, so the Za’atari refugee camp becomes a more livable and enjoyable place”

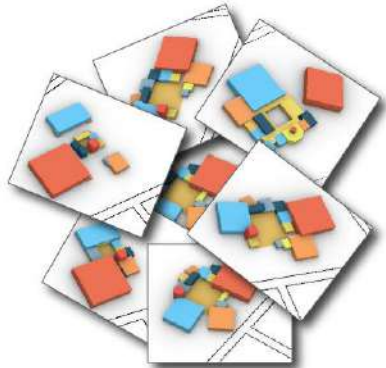




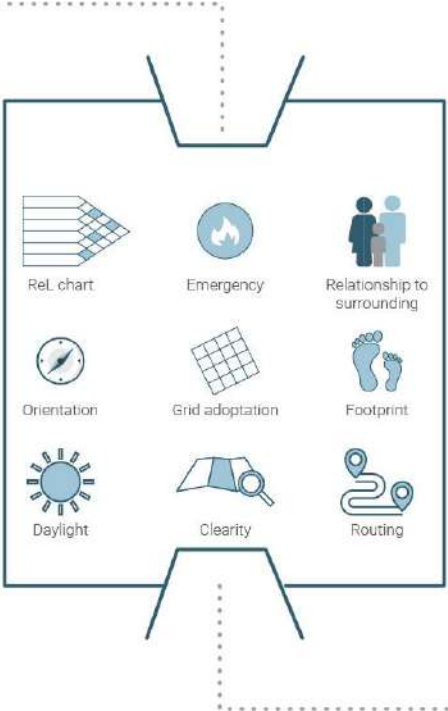




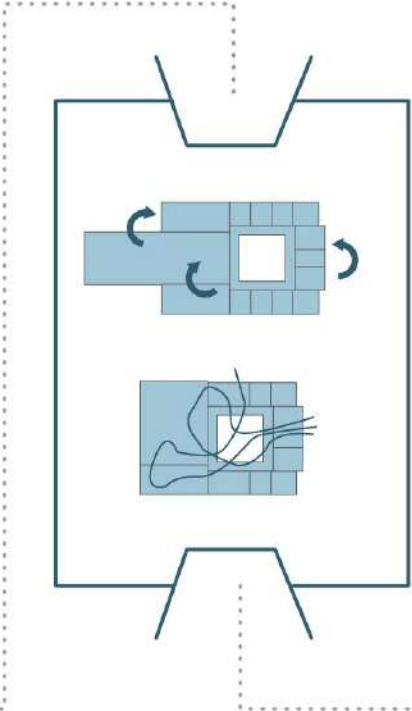
Set of manually and computationally  
created floorplans



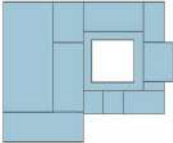
Evaluation



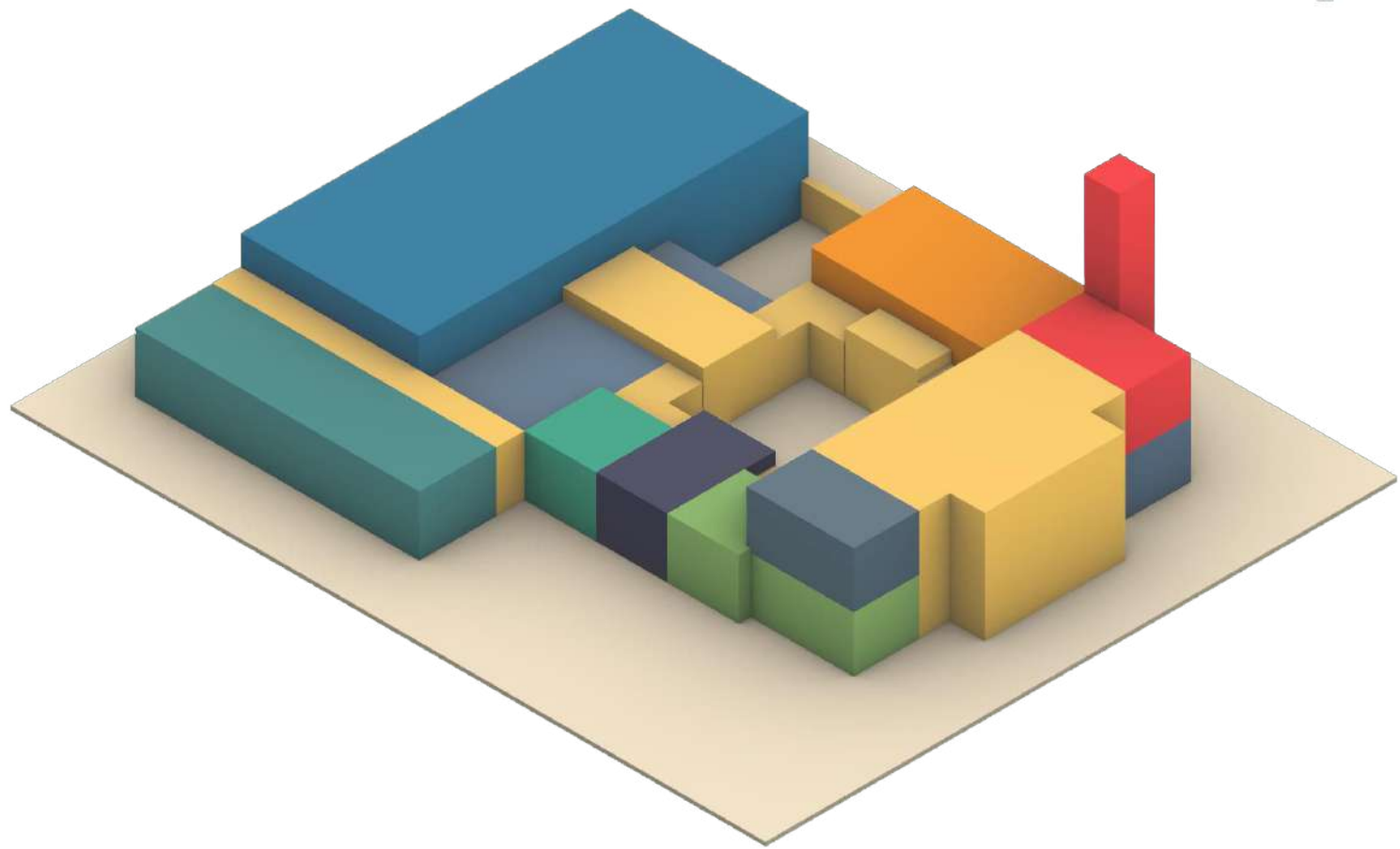
Improve



Finalize

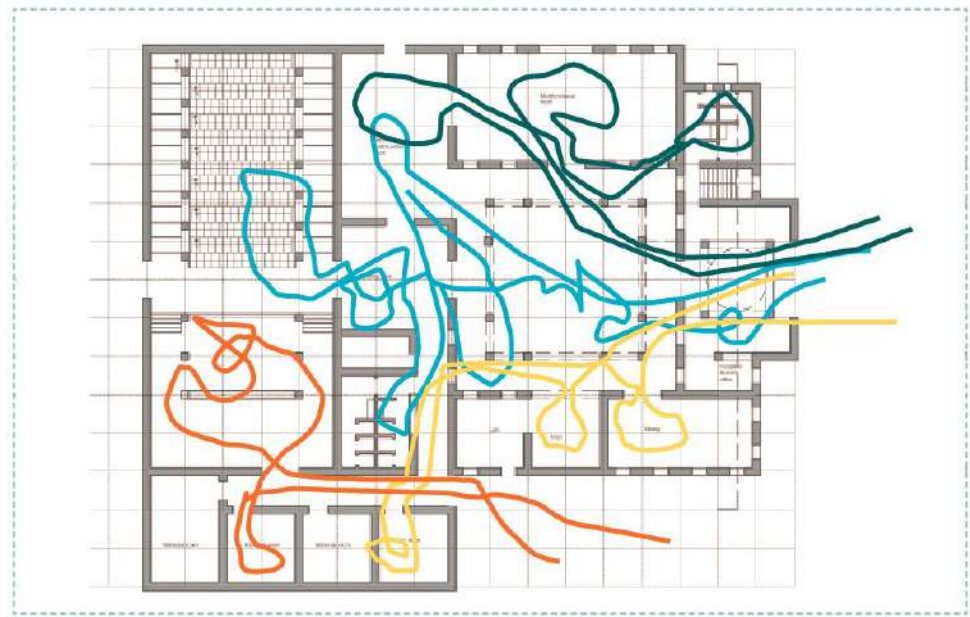




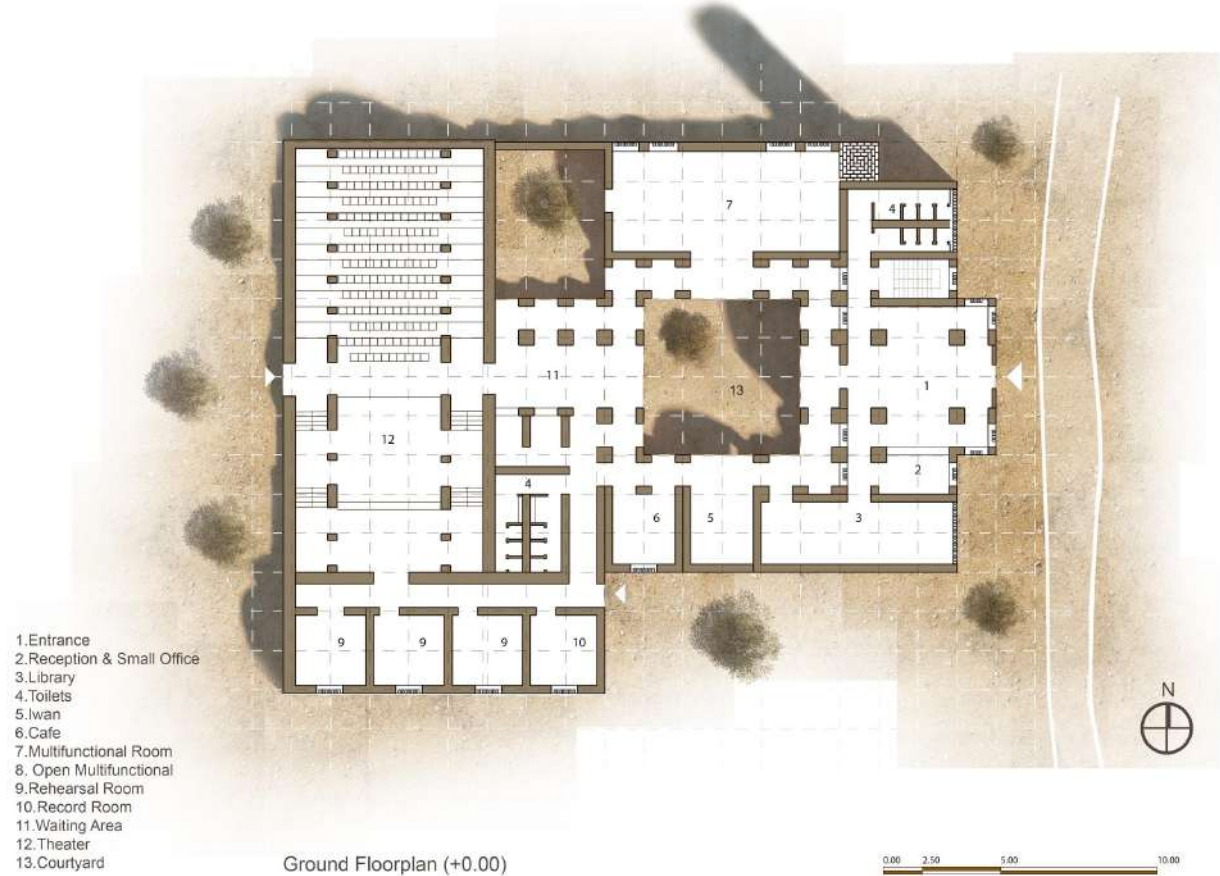


Legend

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- Legend
- Theater visitor
  - Theater performer
  - School children
  - Band



- 1. Entrance
- 2. Reception & Small Office
- 3. Library
- 4. Toilets
- 5. Iwan
- 6. Cafe
- 7. Multifunctional Room
- 8. Open Multifunctional
- 9. Rehearsal Room
- 10. Record Room
- 11. Waiting Area
- 12. Theater
- 13. Courtyard

Ground Floorplan (+0.00)

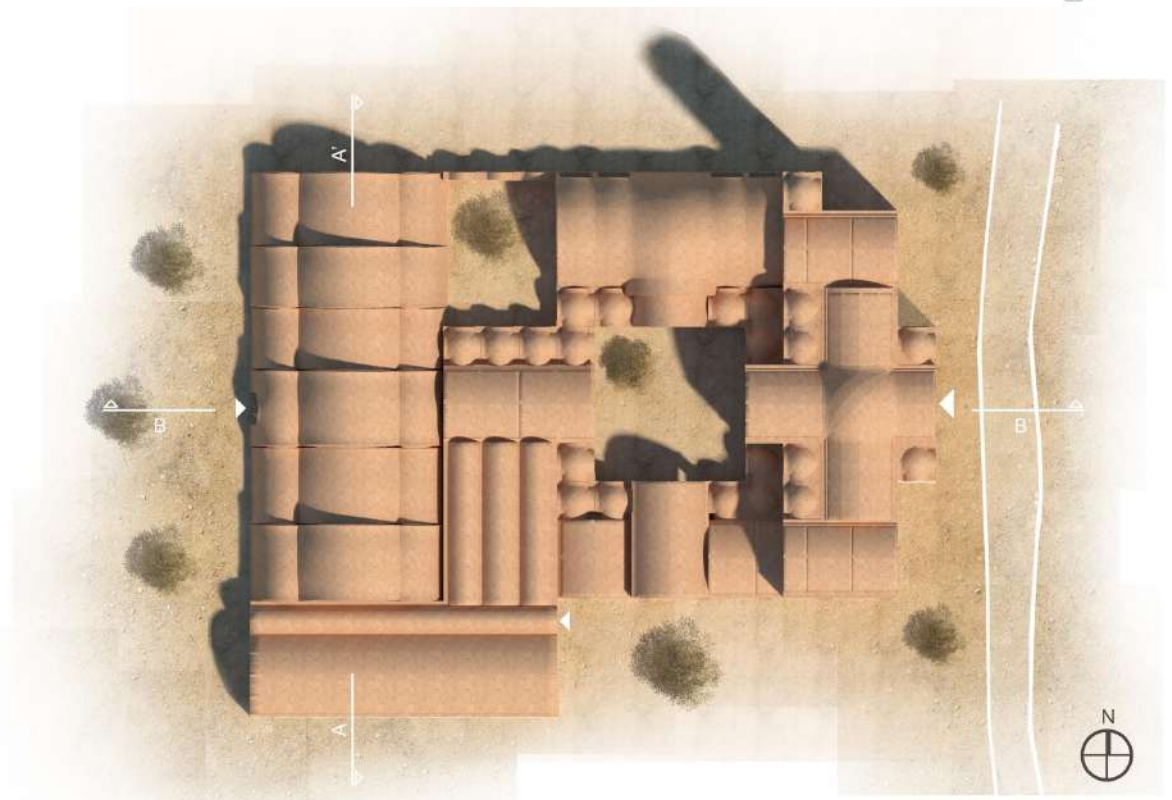




- 1. Radio Station
- 2. Office
- 3. Balcony

1st Floor (+4.00)

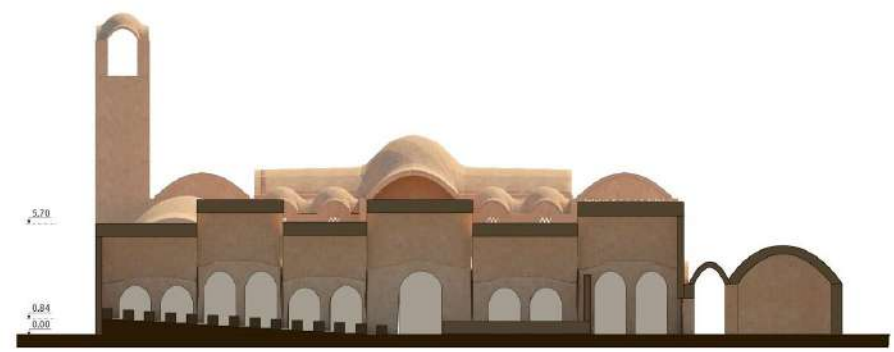




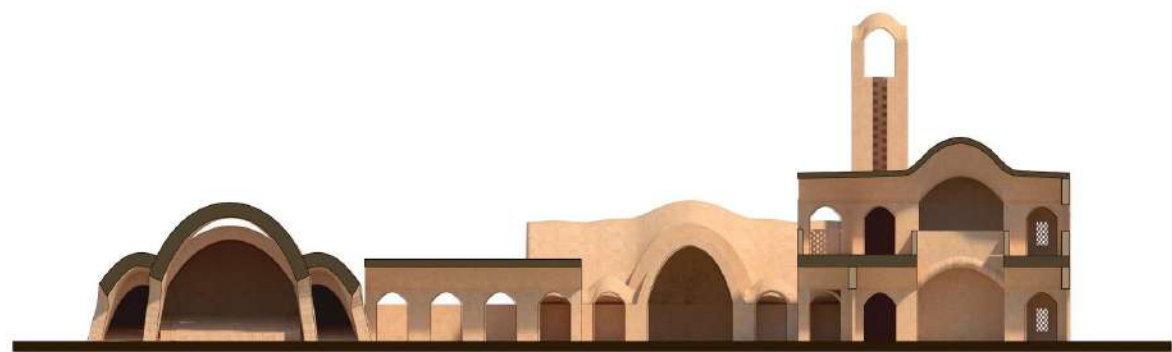
Topographic Plan







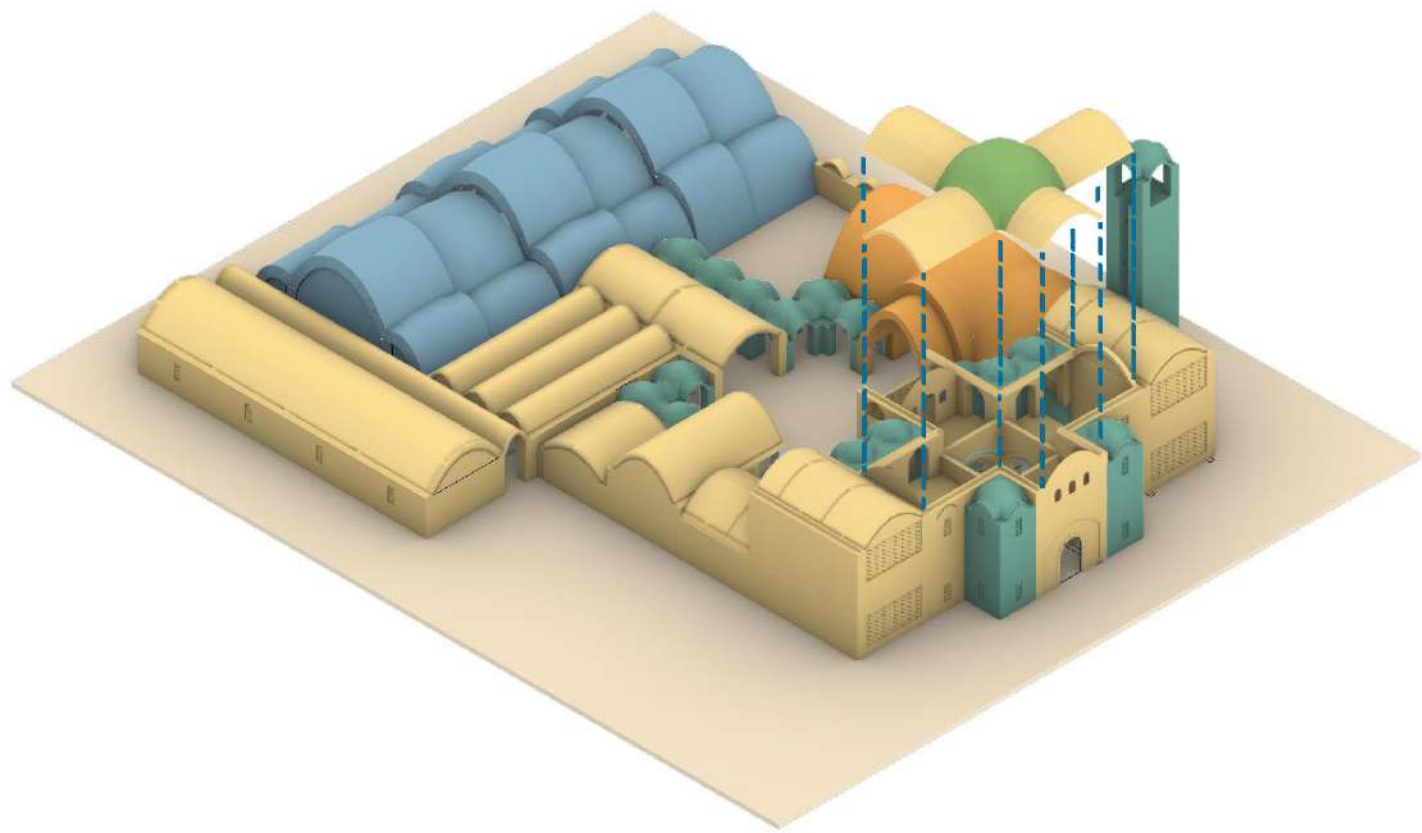
Section A-A'



Section B-B'



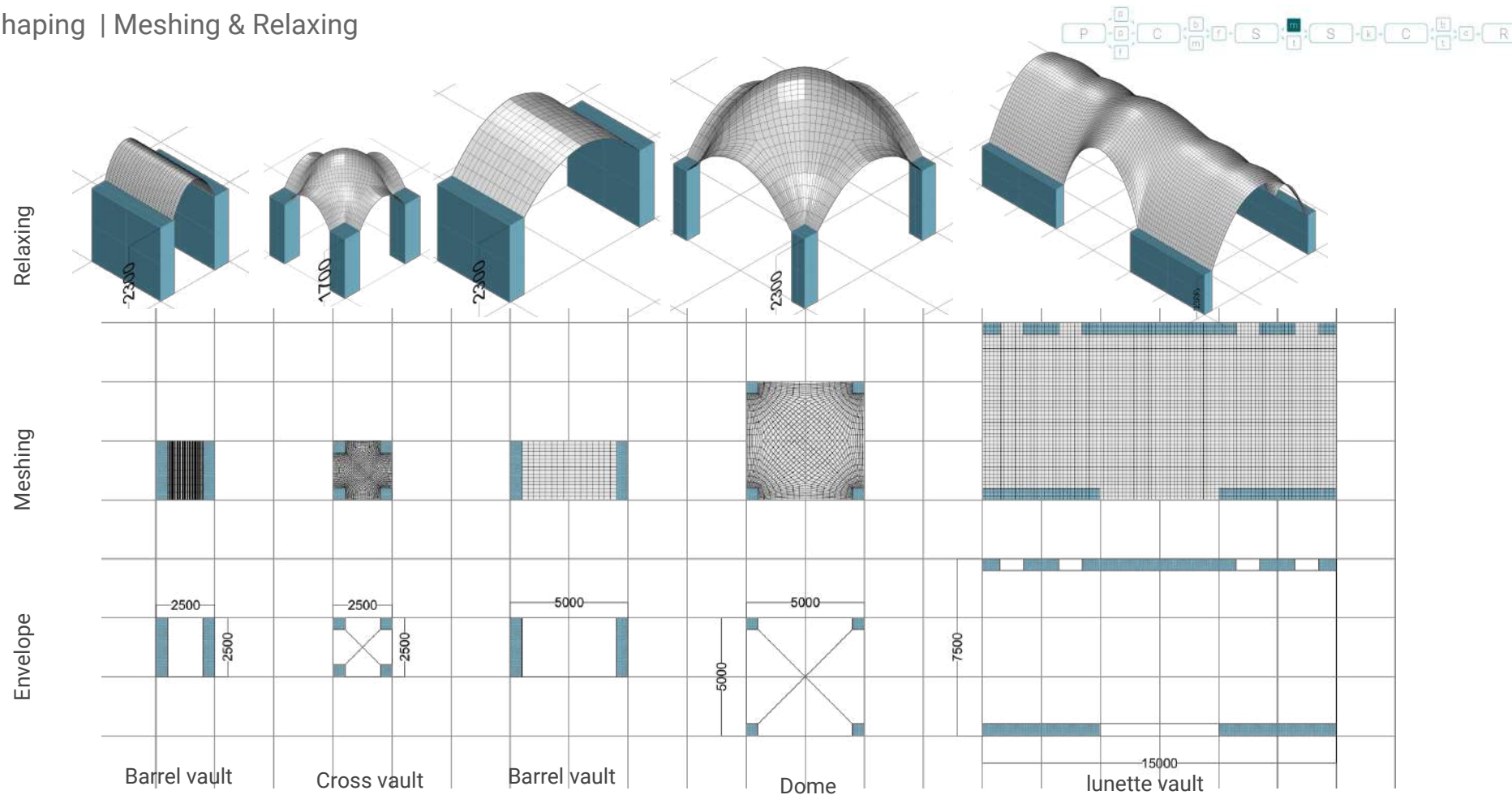




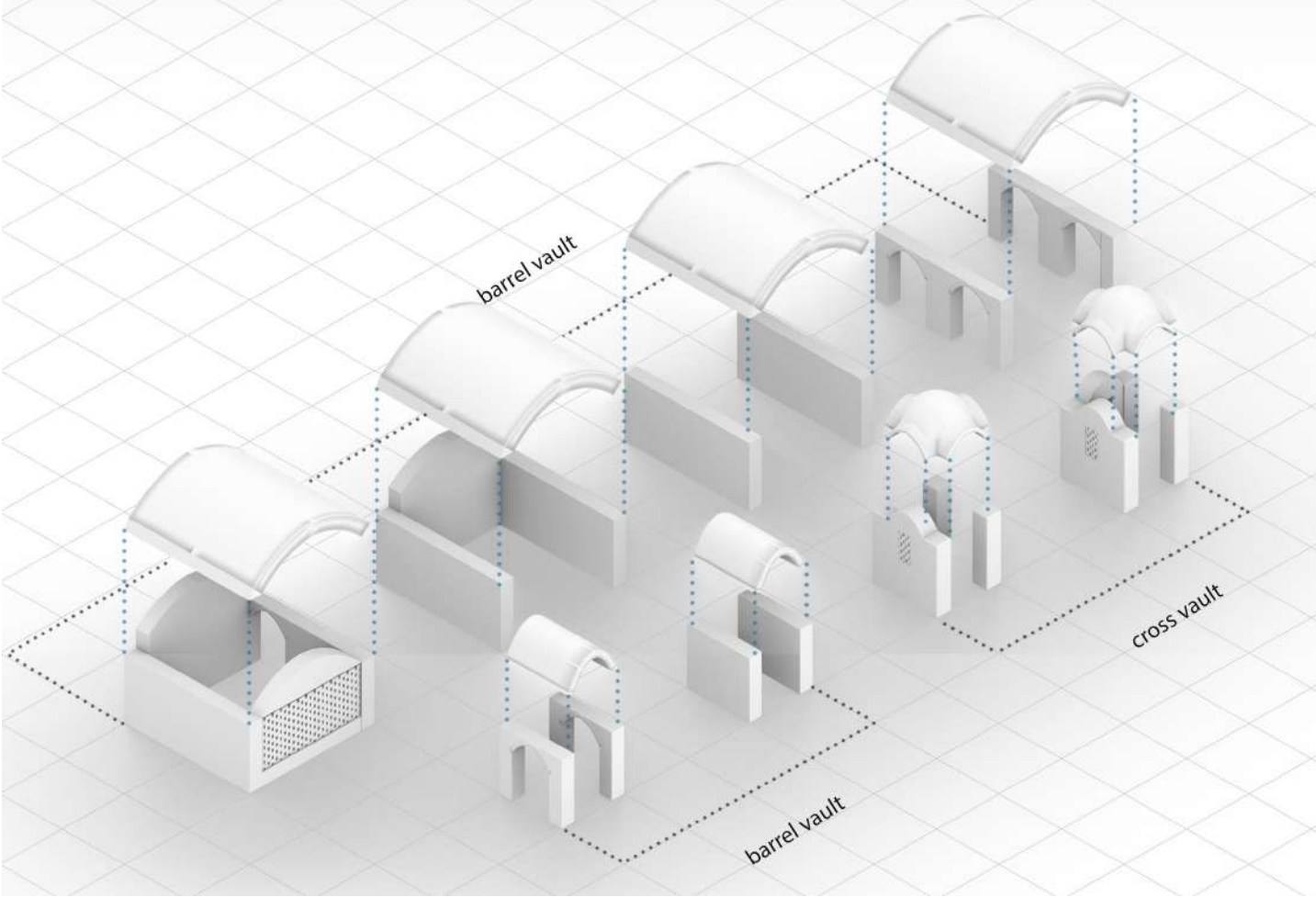
Legend

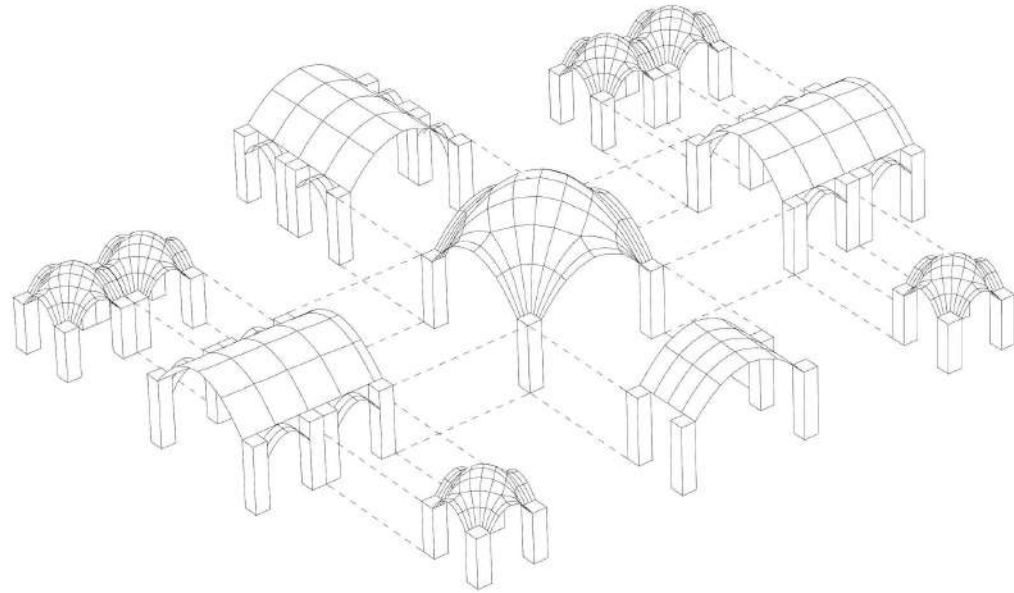




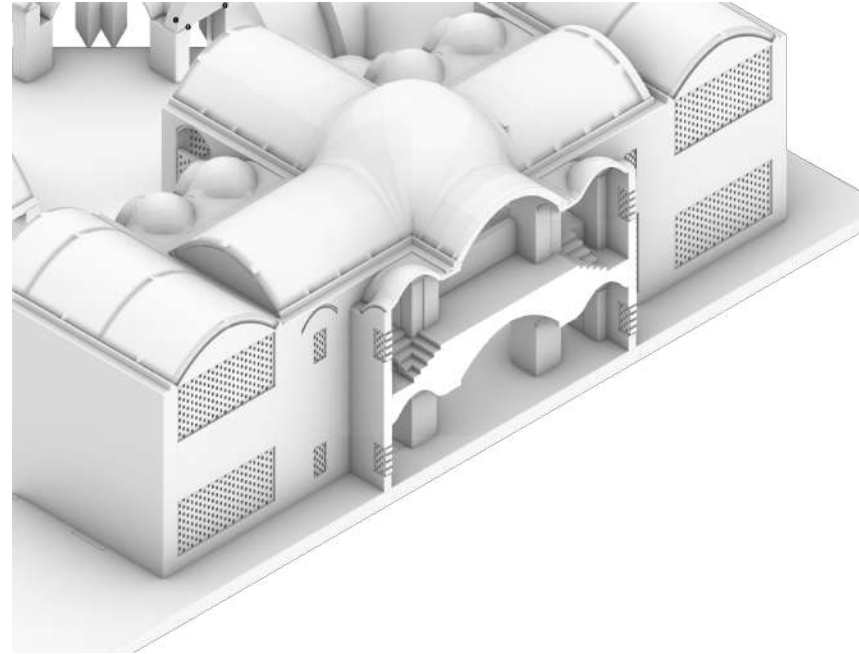


The smallest module is one units ( 2.5 m \* 2.5 m)





The connection between the entrance dome and the vaults next to it



Section in the entrance



1 Base point

2 Determine dimensions

3 Extrude

4 Select proper faces

5 Cut doorway openings

6 Mirror doorways

7 Mesh and apply forces

8 Check structural stability

Change load case / anchor points if stress is too high.

Legend

Automated

Manual

Parametric







Material properties

Compressive strenght [mpa]	2.10
Tensile strenght [mpa]	0.21
Young's modulus [mpa]	115
Density adobe [kN/m3]	15

Displacement

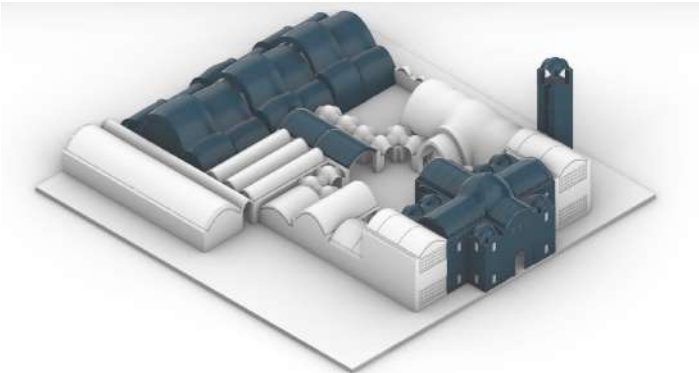
Displacement span	Span*0.0015
Displacement tower	Height/500

Loads

Self-weight [kN/m3]	15
Filling load [kN/m3]	15
Wind load [kN/m2]	2
Live load [kN/m2]	2

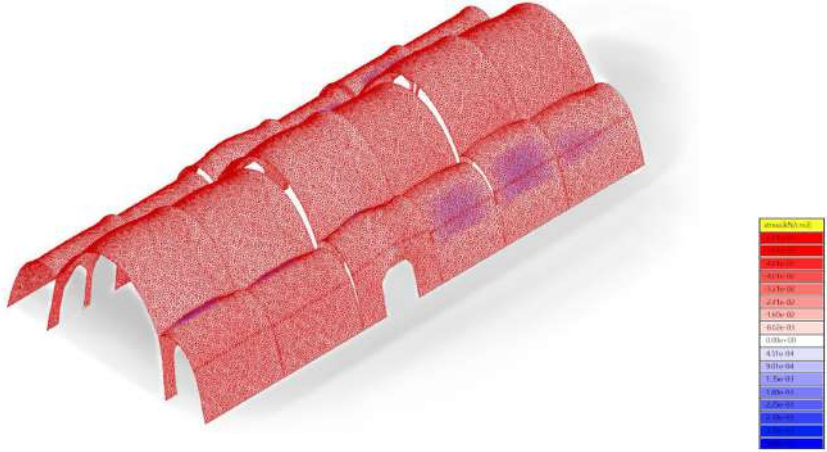
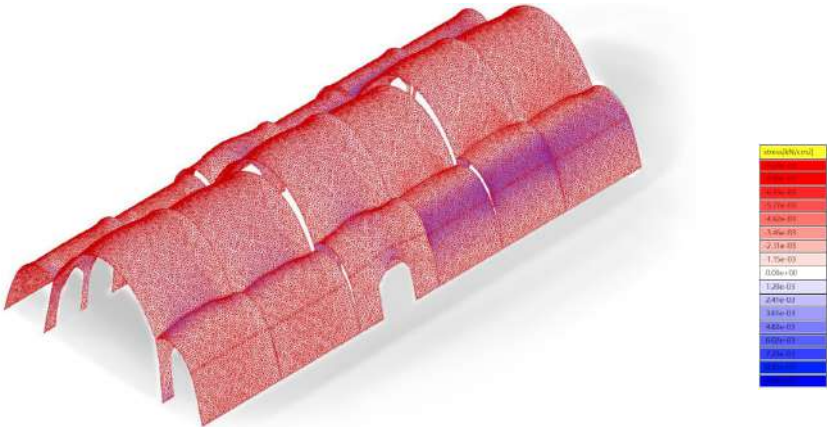
Safety factors

Permanent, unfavorable	1.2
Permanent, favorable	0.9
Variable	1.5



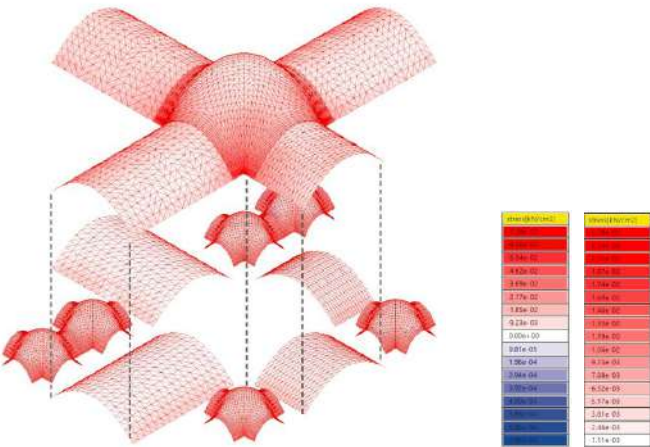
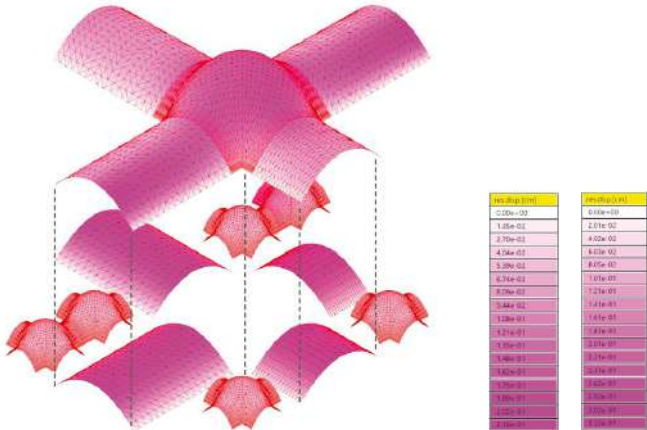
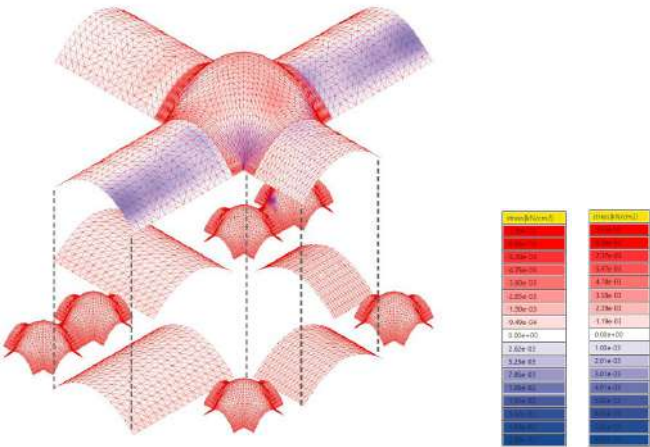


	Allowable	Peak
Compressive strenght [mpa]	2.10	0.64
Tensile strenght [mpa]	0.21	0.10
Displacement [mm]	11.25	10.60
Cross section thickness [mm]	875	





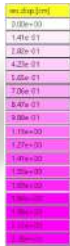
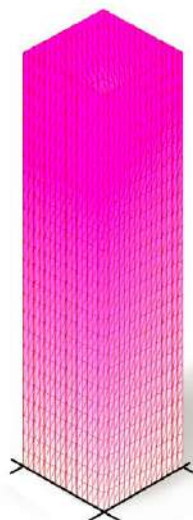
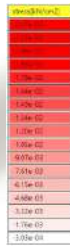
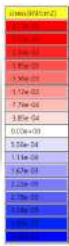
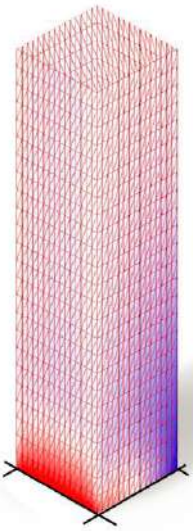
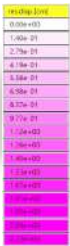
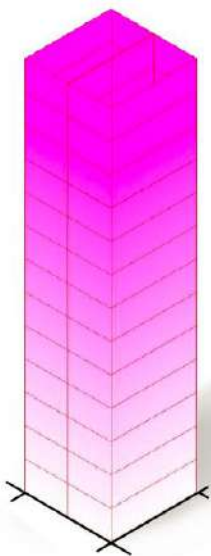
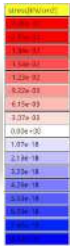
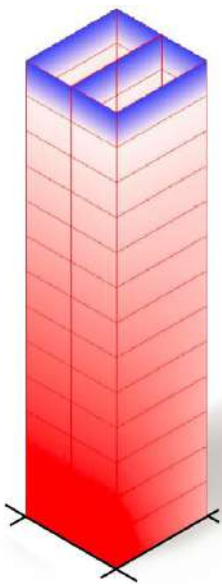
	Allowable	Peak 1st floor	Peak 2th floor
Compressive strenght [mpa]	2.10	0.74	0.23
Tensile strenght [mpa]	0.21	0.21	0.08
Displacement [mm]	7.50	2.16	3.22
Cross section thickness [mm]		500	250

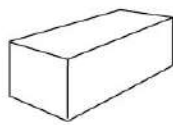
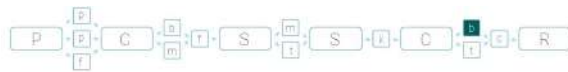






	Allowable	Beam	Tube
Compressive strenght [mpa]	2.10	0.25	0.28
Tensile strenght [mpa]	0.21	8.53e-18	0.09
Displacement [mm]	24.0	22.3	22.6
Height [m]		12	12



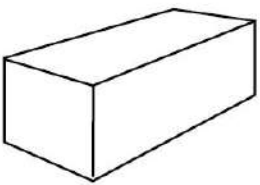


**Benefits:**

- + Lighter +
- + Easy to lift by hand +
- + Fluent arches +
- + Dries more efficient – less possible cracks +

**Disadvantages:**

- More bricks needed -
- Less stability -
- More mortar – more possible cracks and leakages -
- Does not fit the grid size – problems with windows, doors -

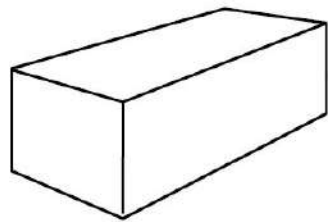


**Benefits:**

- + Less bricks needed
- + More stability
- + Less mortar – less possible leakage – less possible cracks

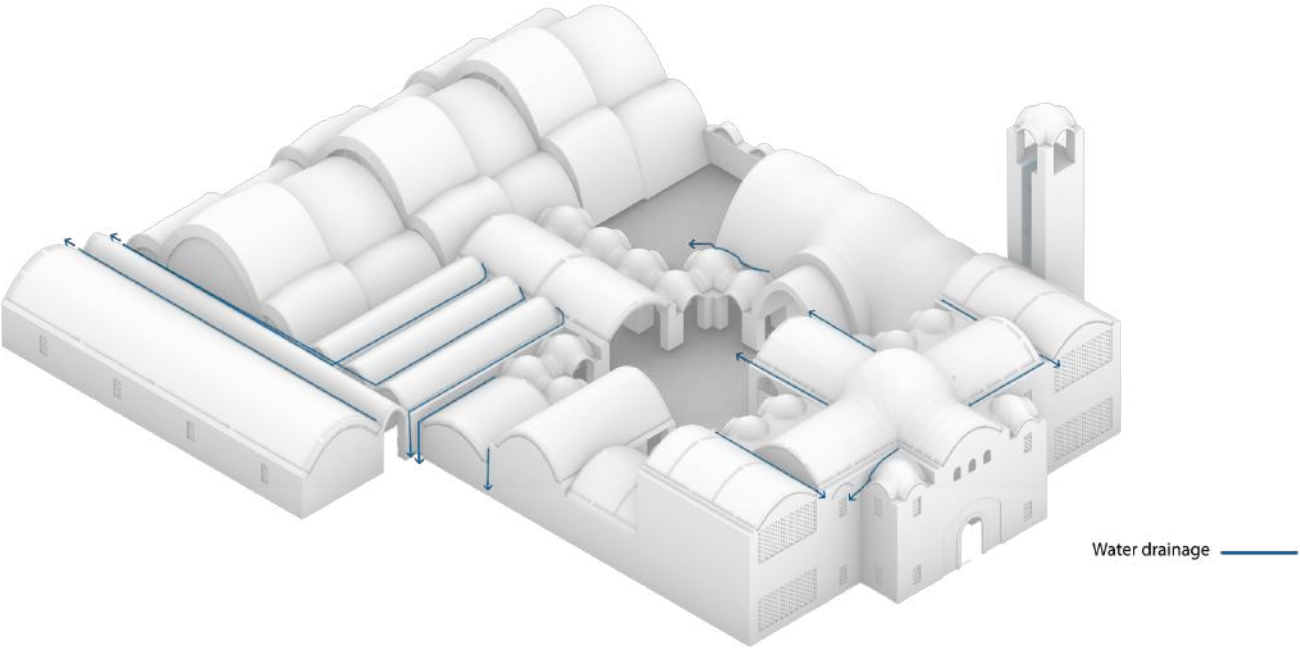
**Disadvantages:**

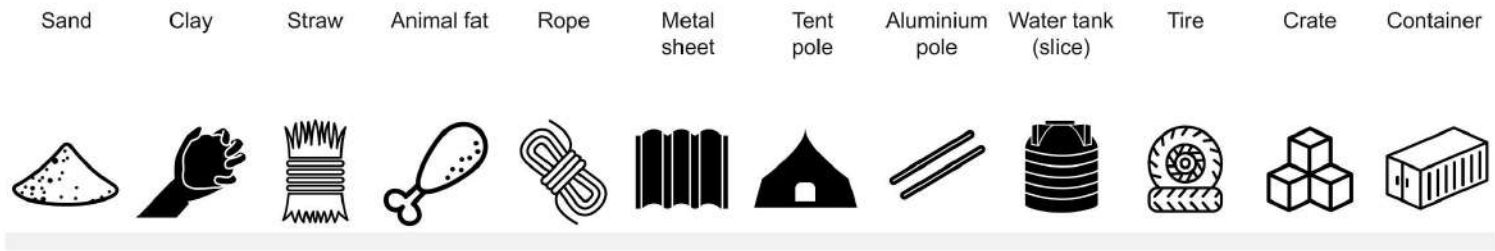
- Heavier
- Less convenient to lift by hand
- Does not fit the grid size – problems with windows, doors
- Dries less efficient – possible cracks
- Less fluent arches



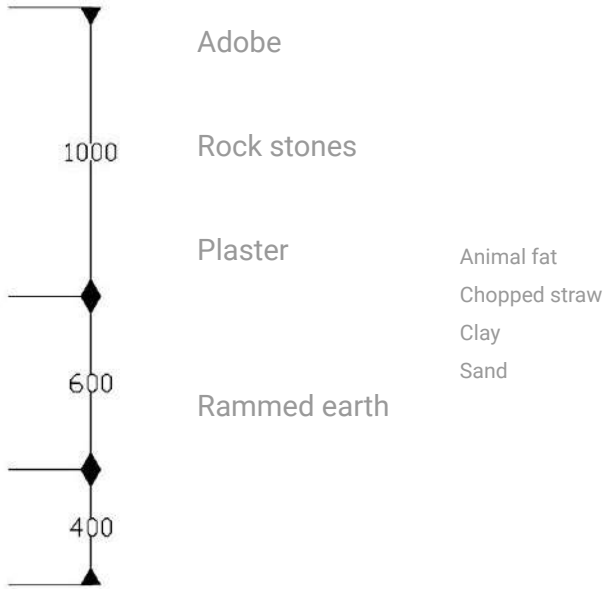
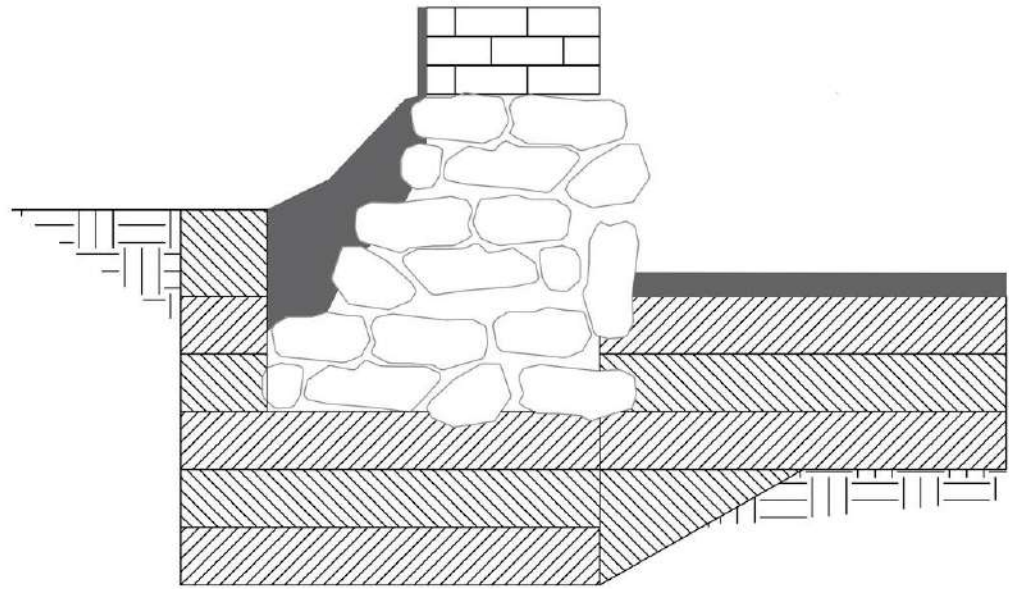
	Length [mm]	Width [mm]	Height [mm]
Brick size wall	250	125	100
Brick size vault	250	125	125
Brick size tower	400	200	150

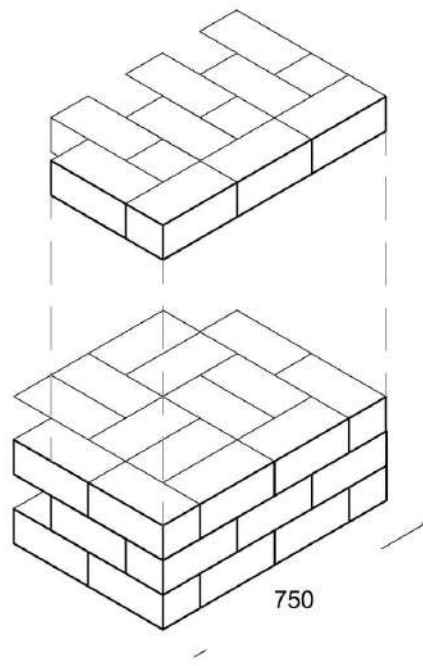
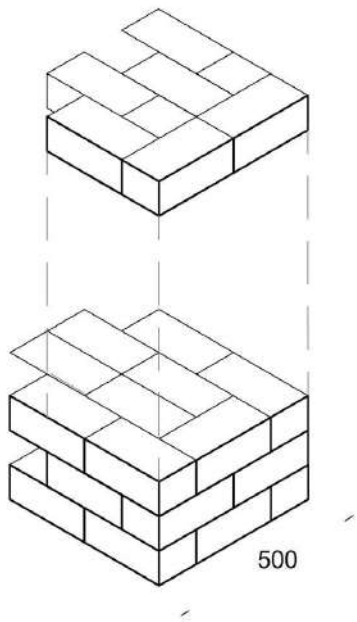
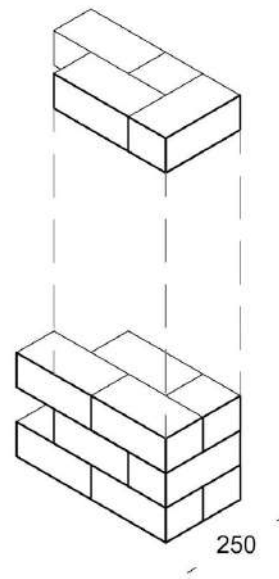
	Clay [%]	Fine sand [%]	Coarse sand [%]	Water [%]	Additive
Brick properties	30	30	40	10	Straw
Plaster properties	10	55	30	10	Straw + animal fat





Application	Sand Foundation Flooring Bricks Mortar Coating	Foundation Flooring Bricks Mortar Coating	Flooring Bricks	Coating	Compass method Pulley system	Cross vault	Cross vault	Cross vault	Arched win- dow Door	Arched win- dow	To reach height	To reach height
Source	On site	Creek 1km west of the camp site	Creek 1km west of the camp site	Chickens inside the camp	UNHCR tents	In the camp	In the camp	Fences surrounding the camp	In the camp	In the camp	In the camp	In the camp



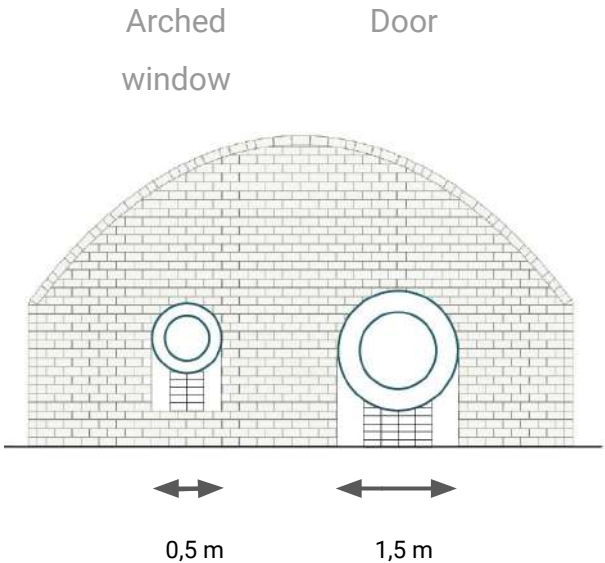
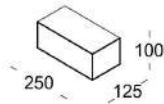




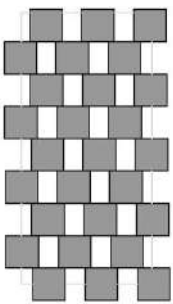
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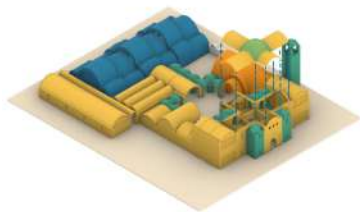
Tire






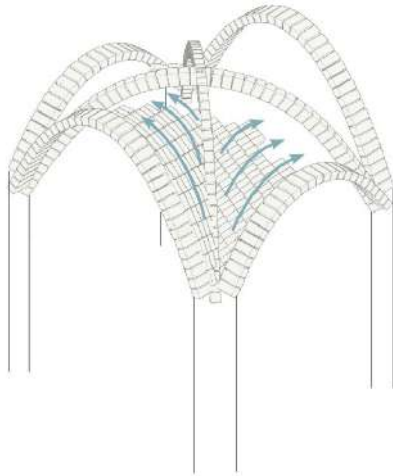
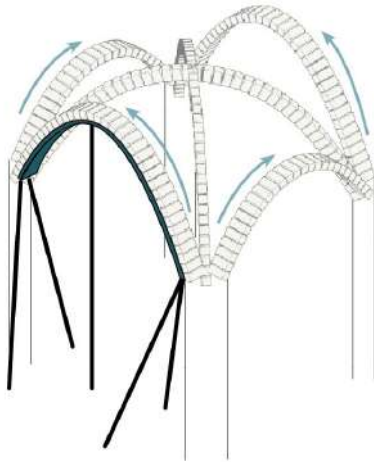
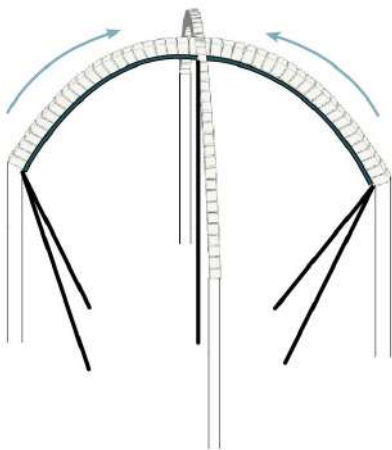
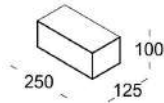
Mashrabiya



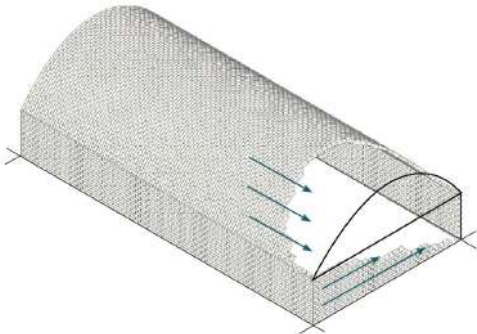
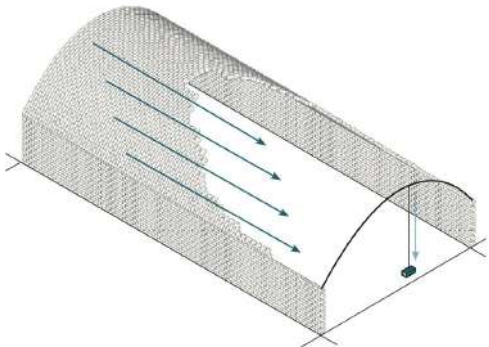
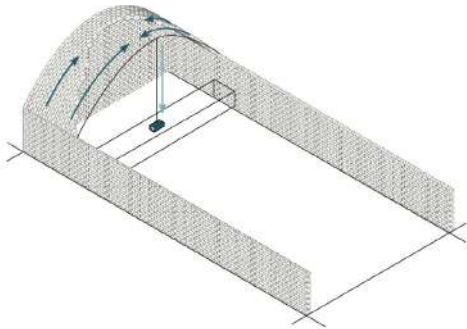
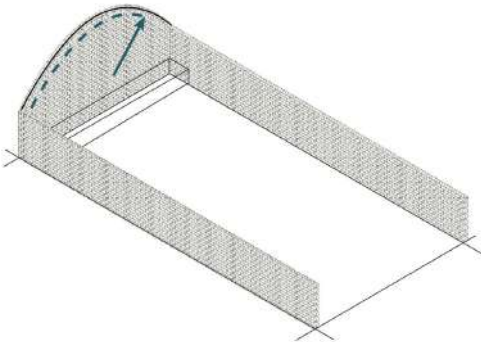
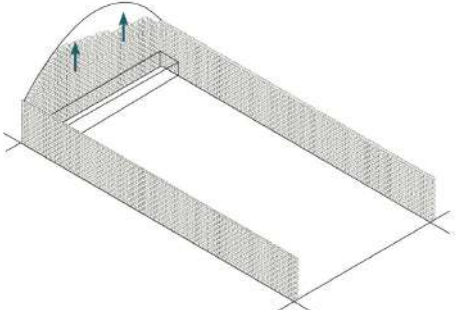
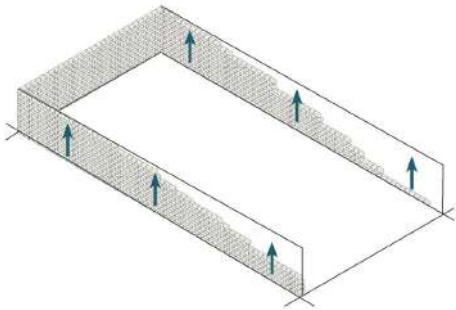


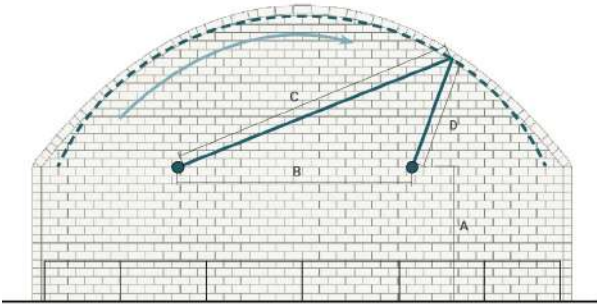


-  Aluminium - pipes
-  Metal sheet
-  Tent pole

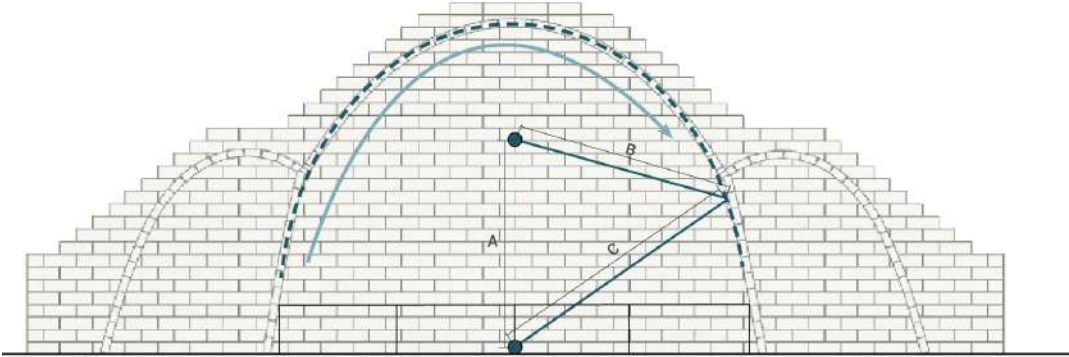




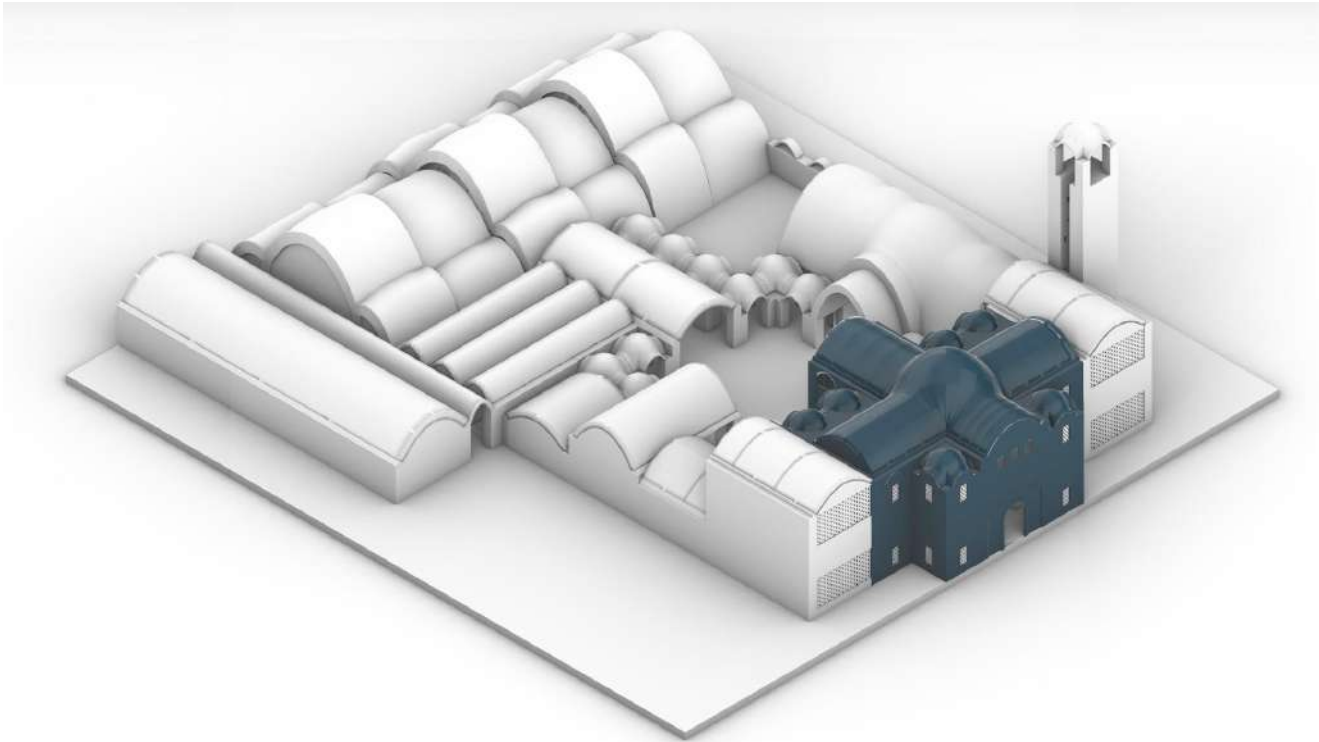


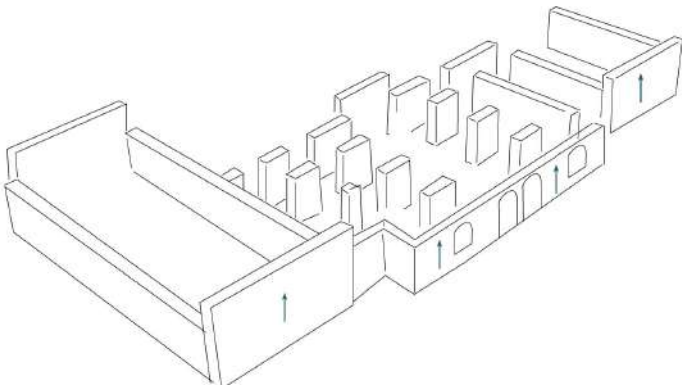
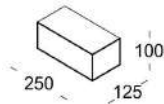
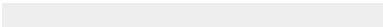
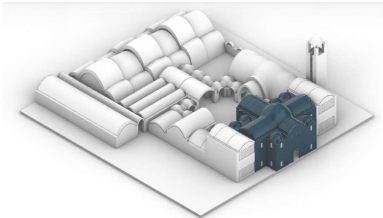


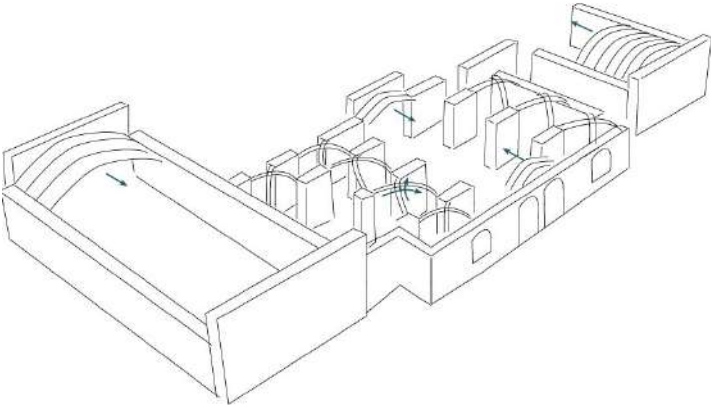
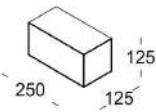
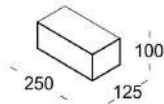
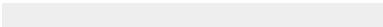
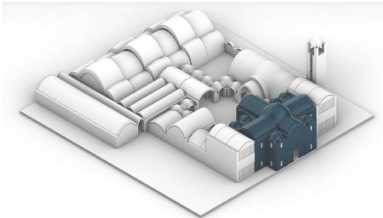
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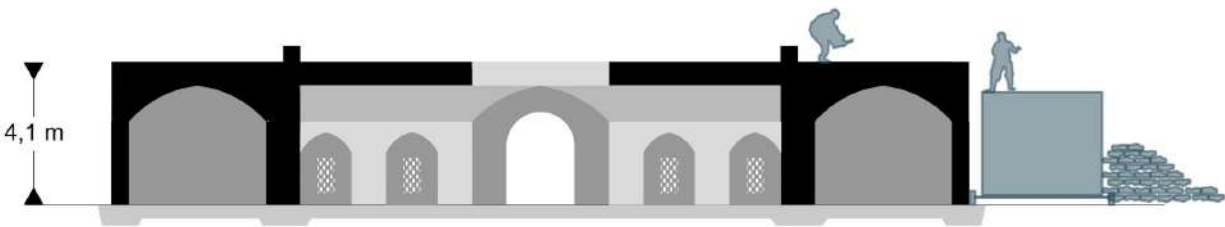
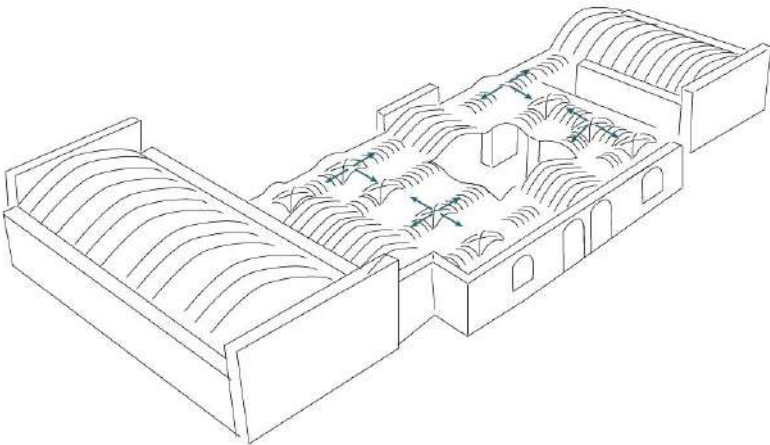
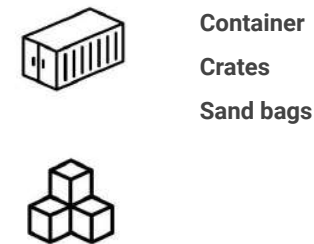
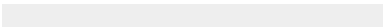
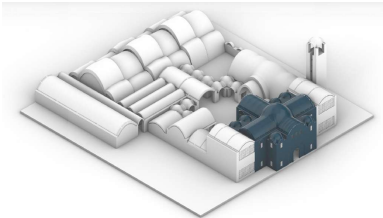


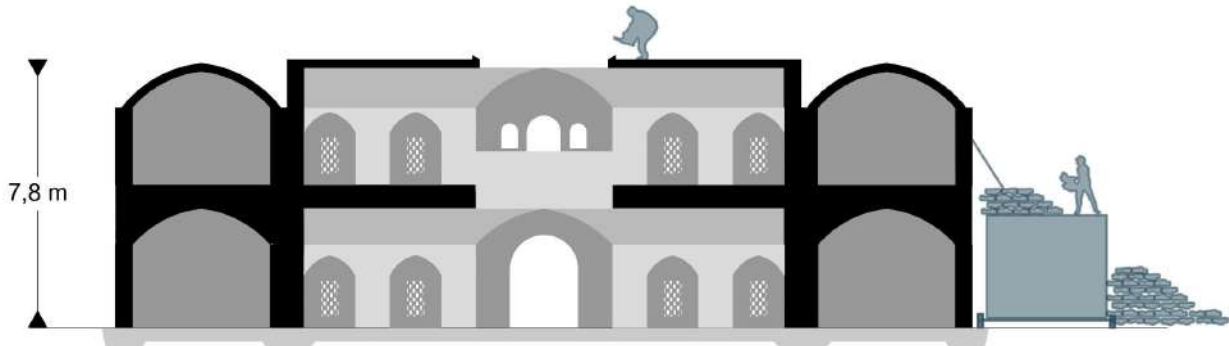
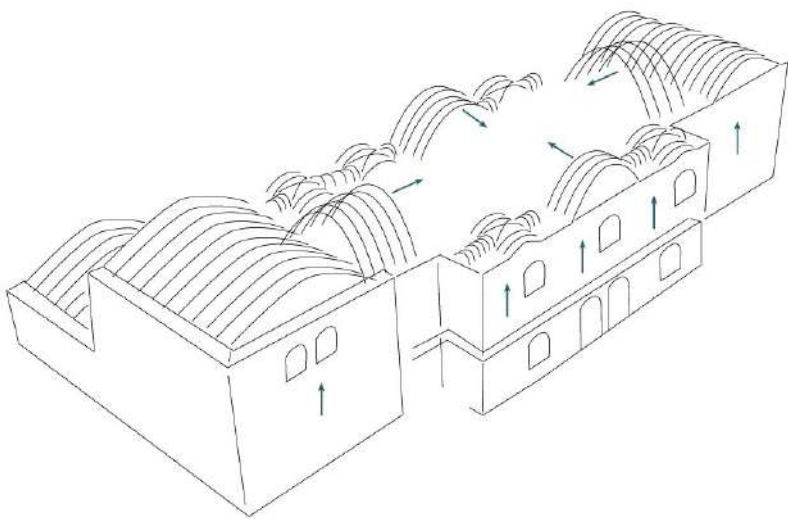
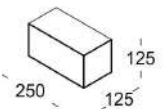
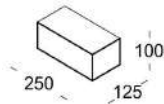
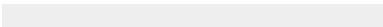
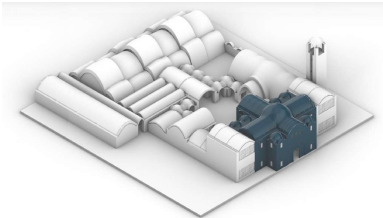
Nubian vault

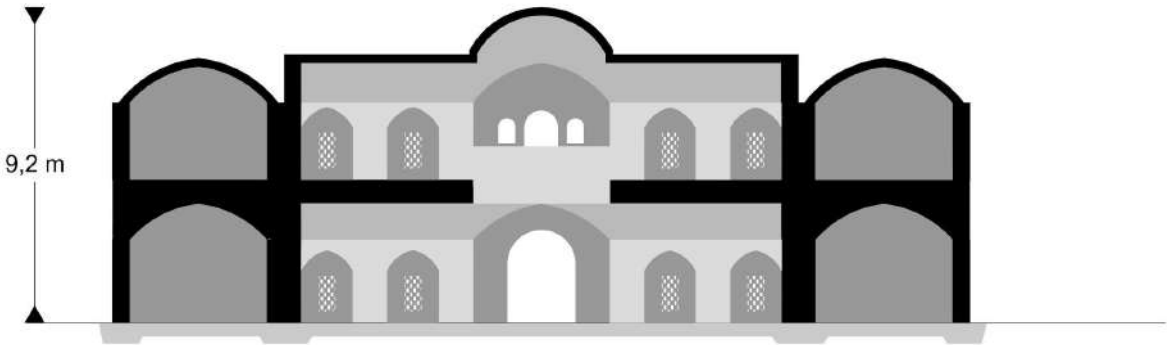
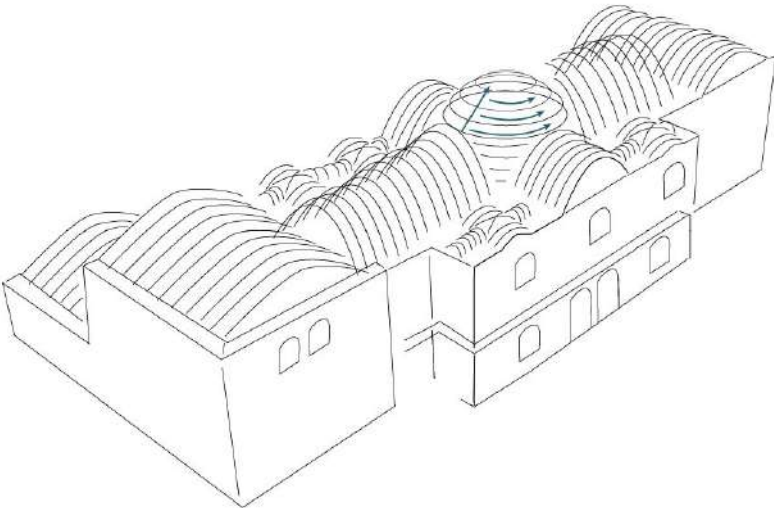
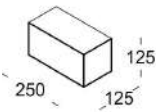
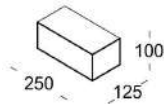
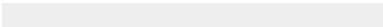
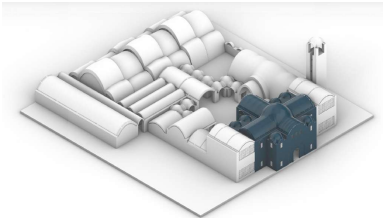






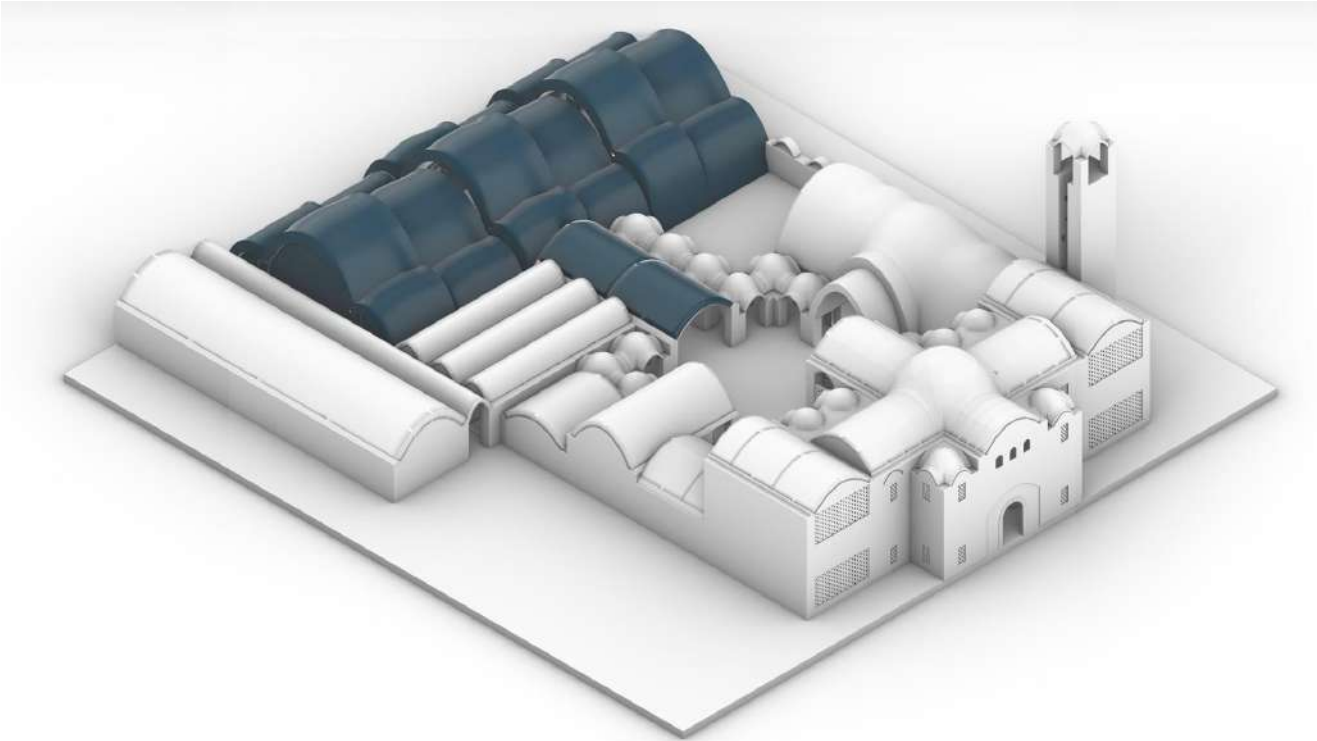


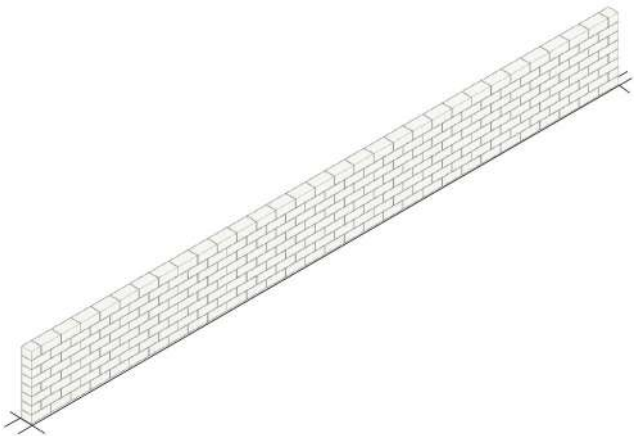
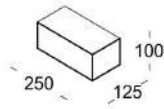
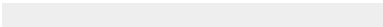
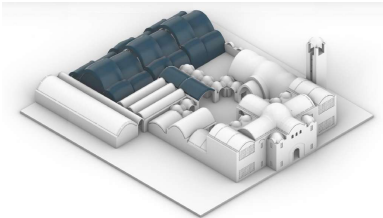


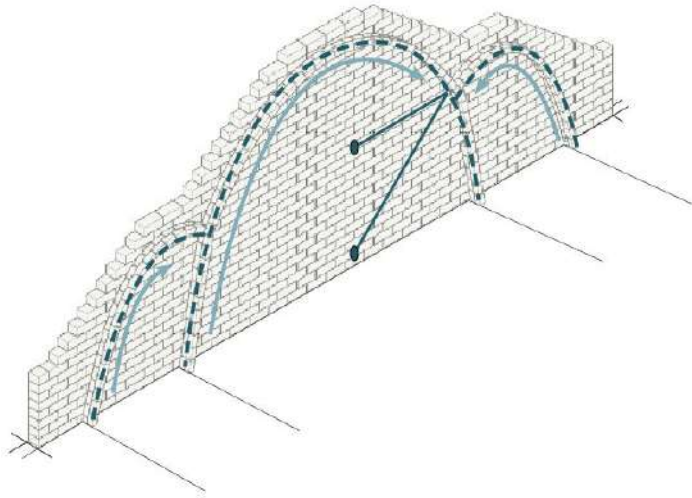
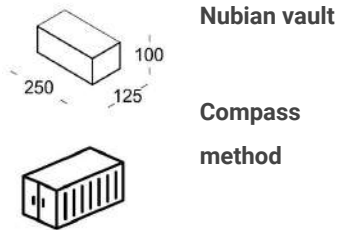
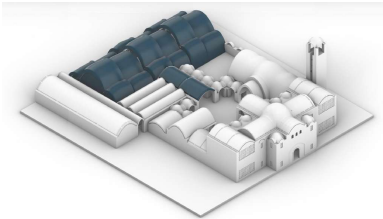


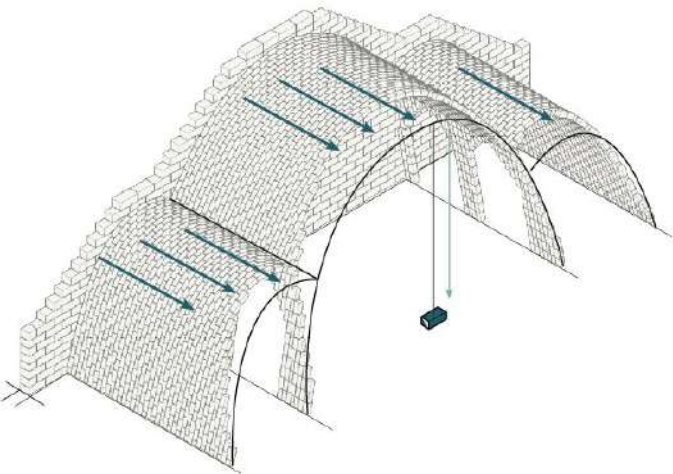
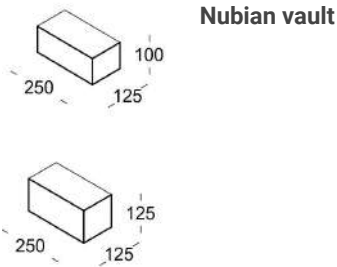
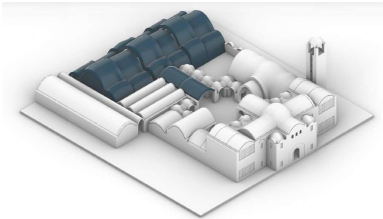




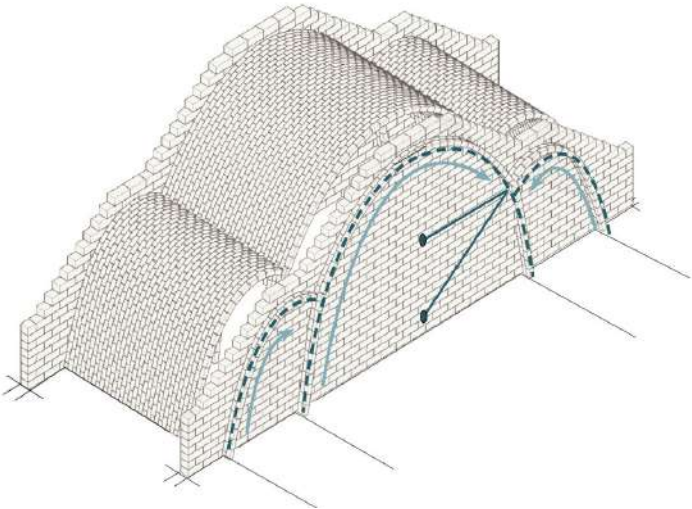
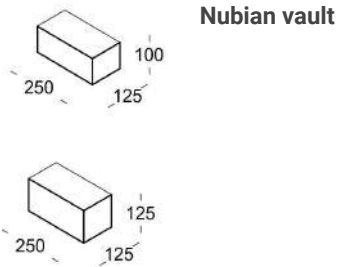
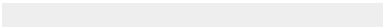
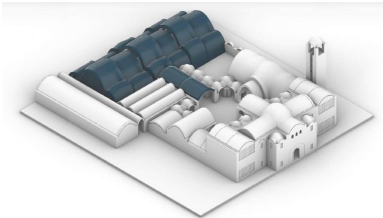




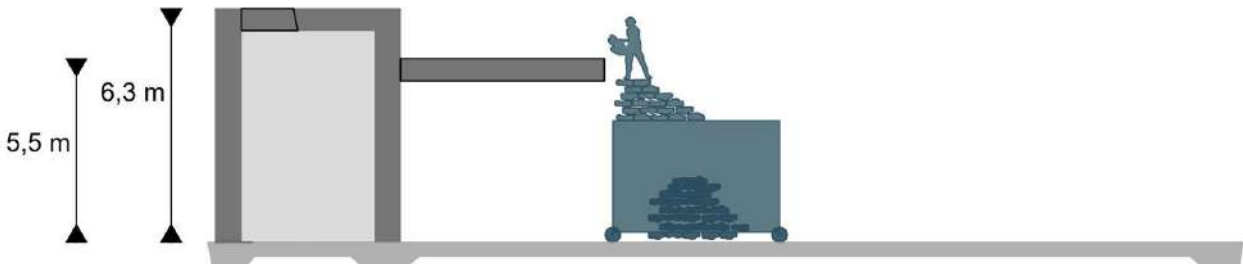
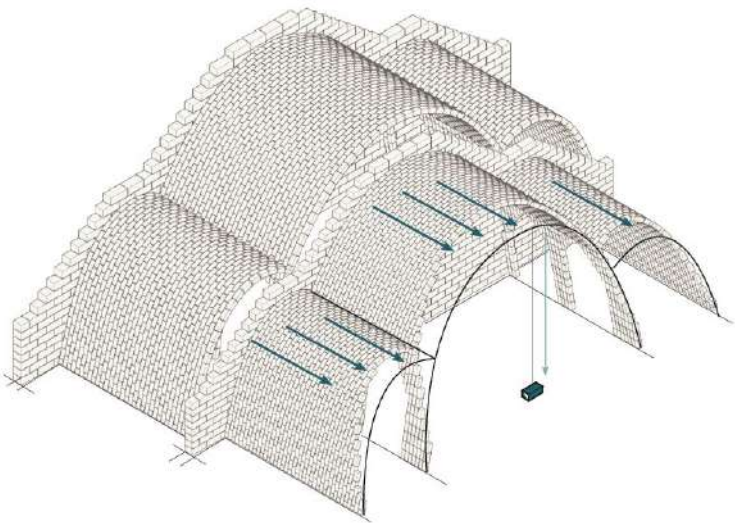
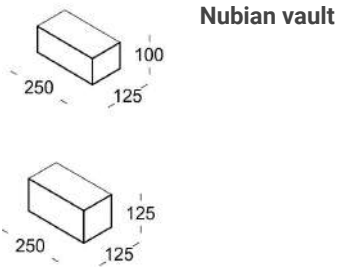
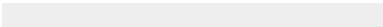
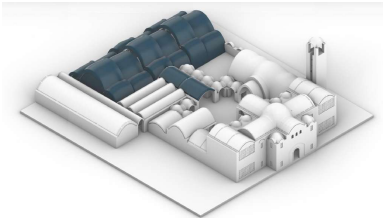


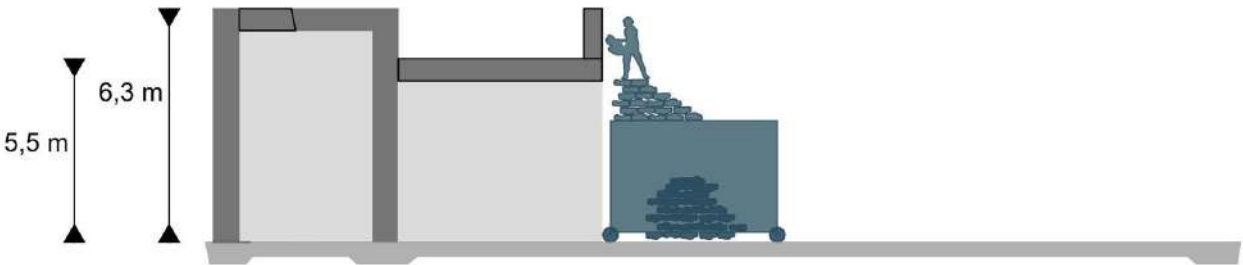
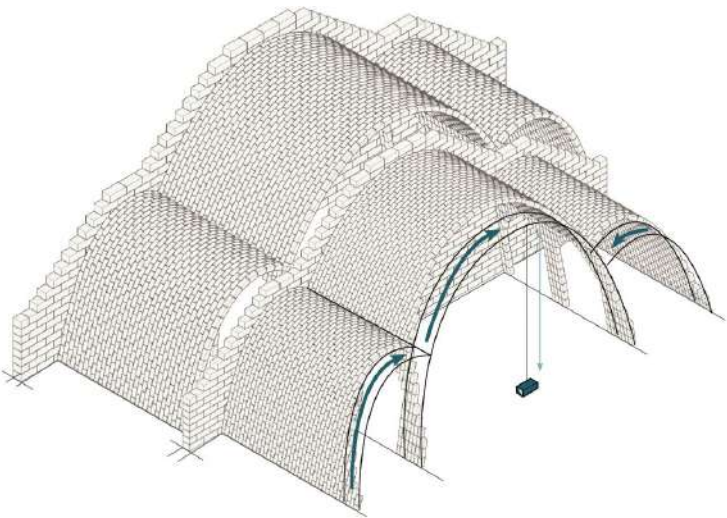
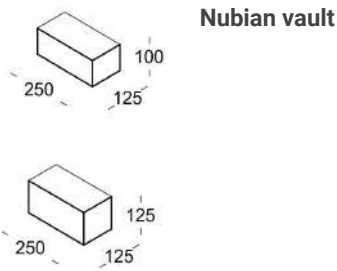
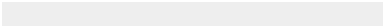
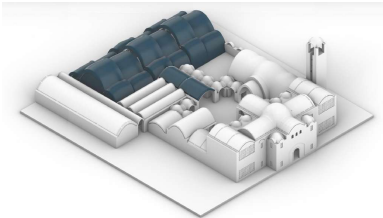


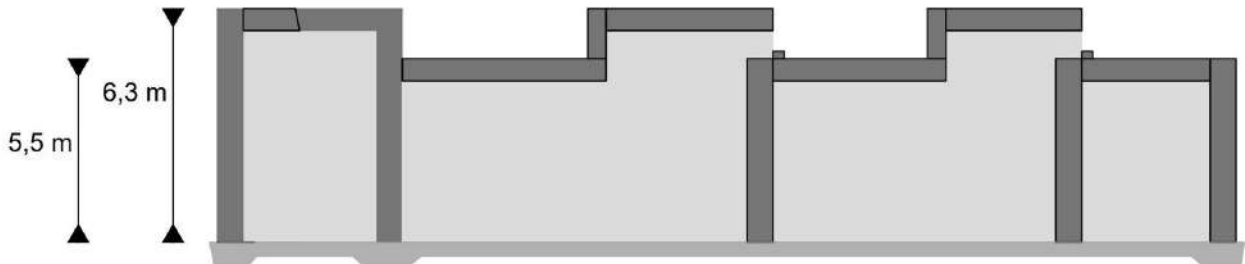
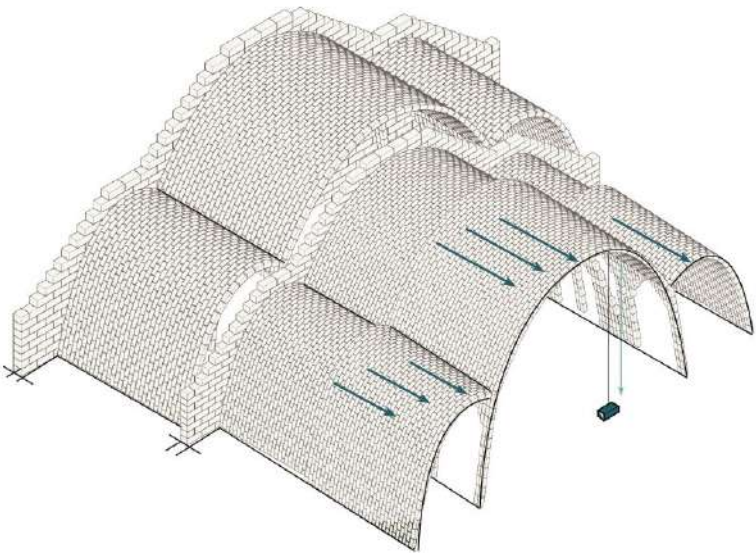
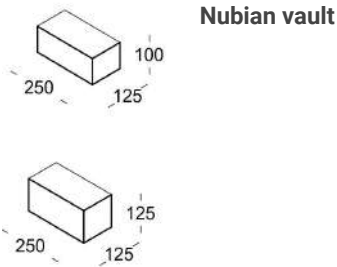
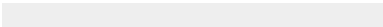
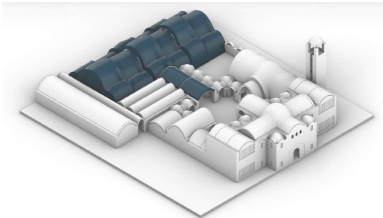


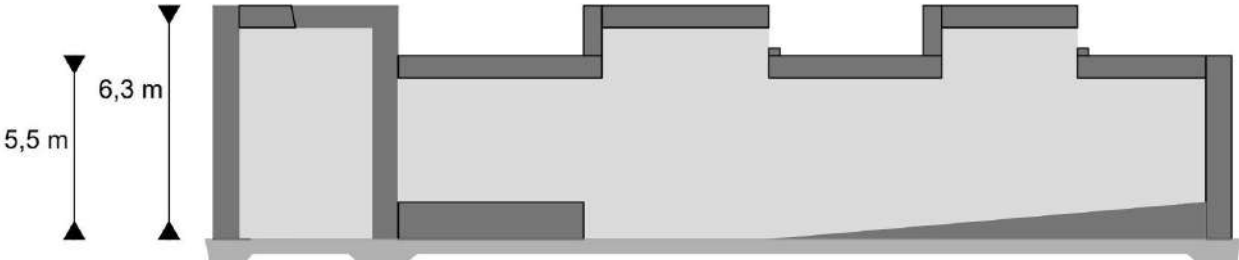
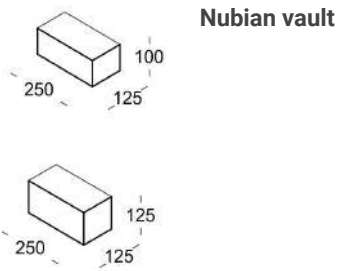
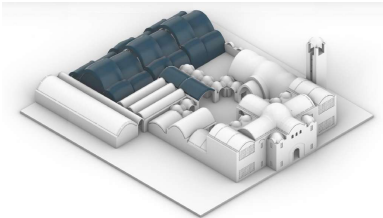




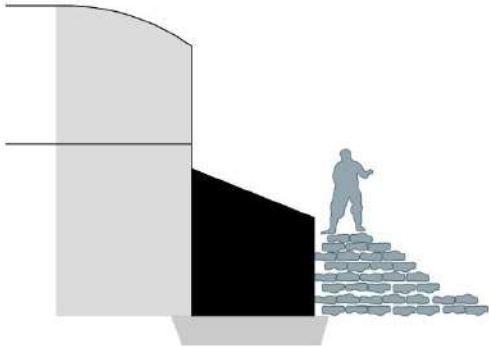
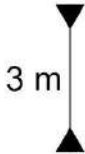
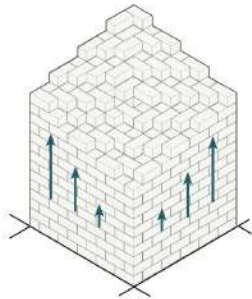
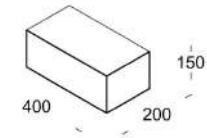
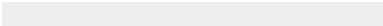
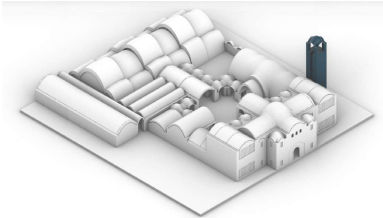




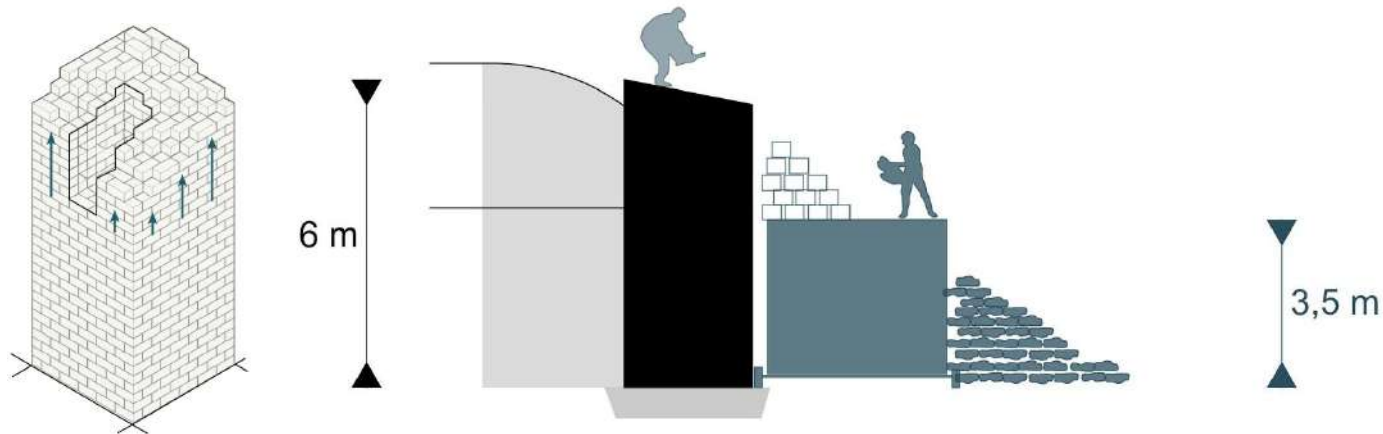
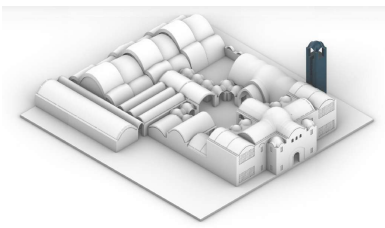


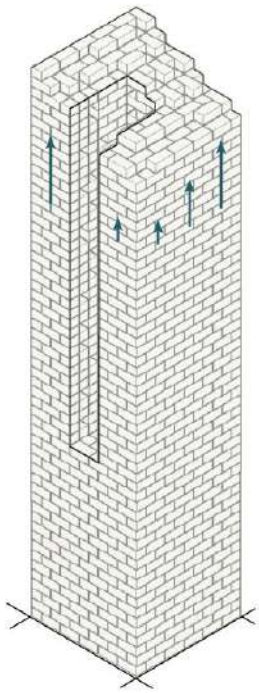
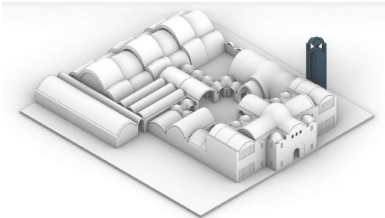




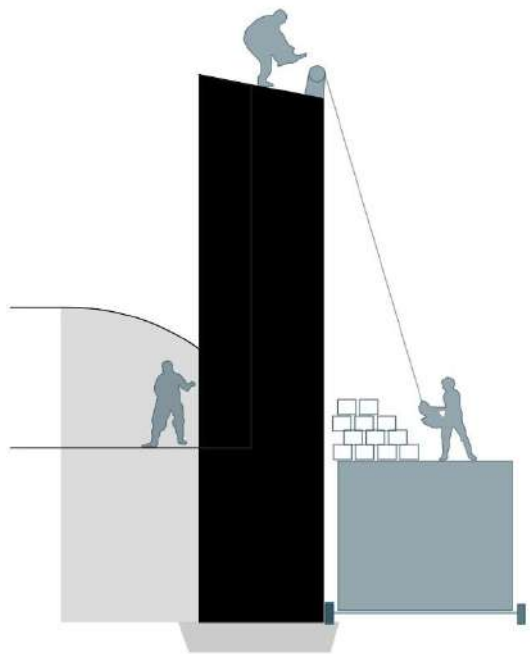




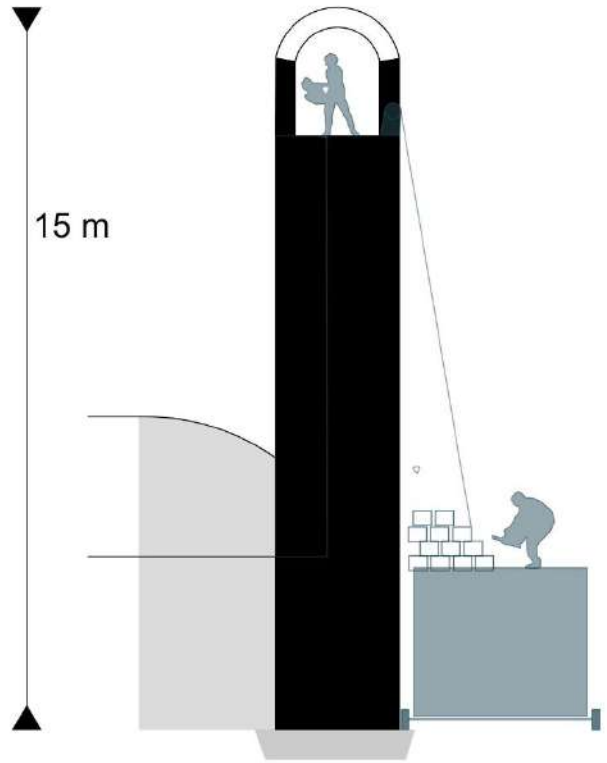
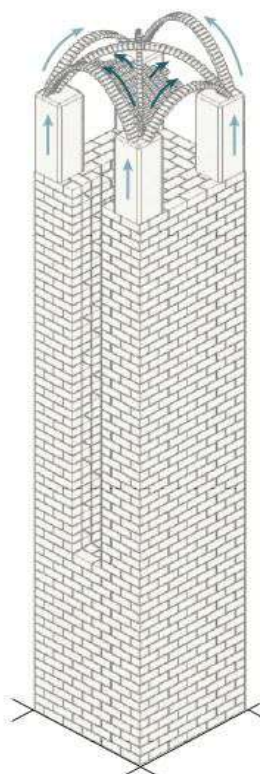
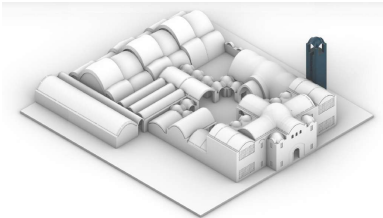




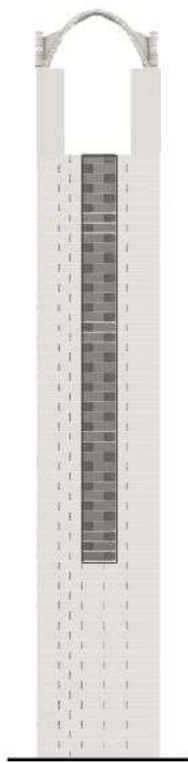
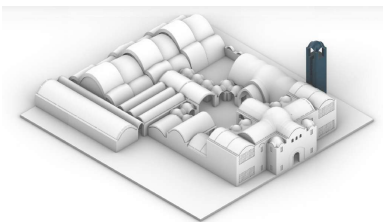
11 m



3,5 m



3,5 m







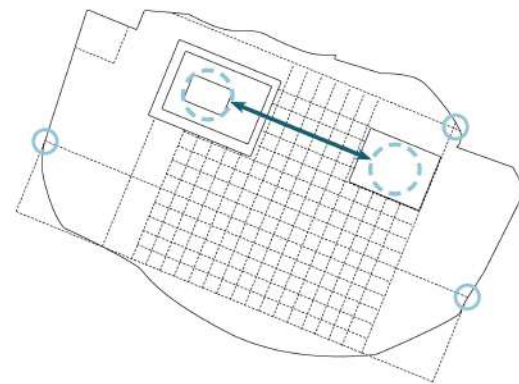
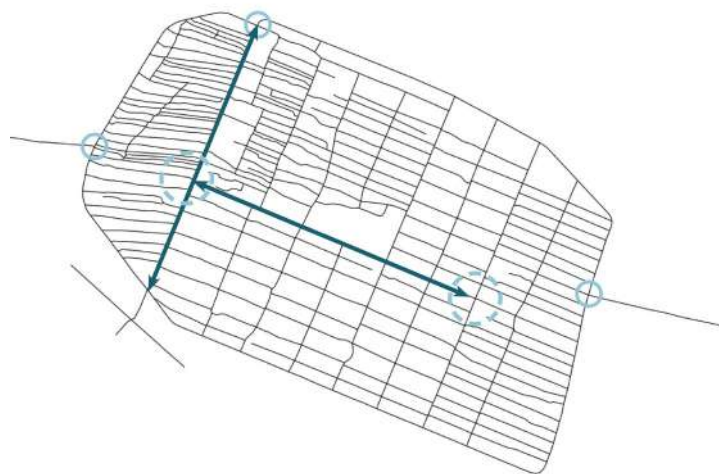
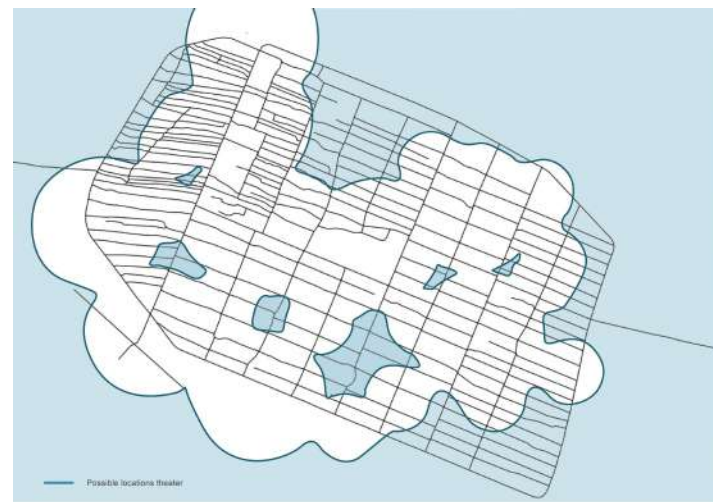
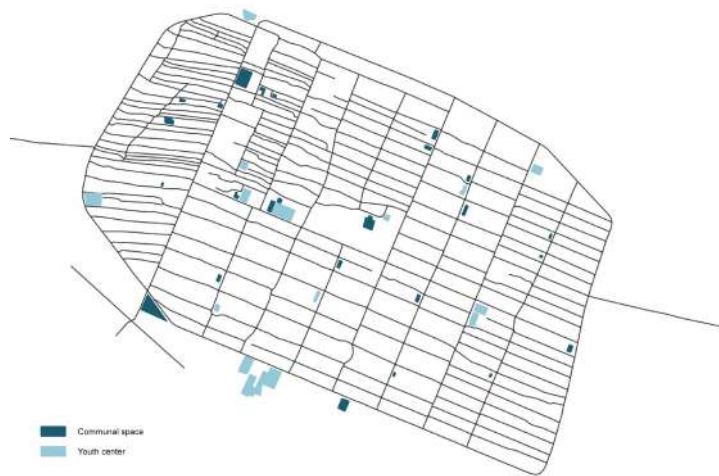
## Conclusion

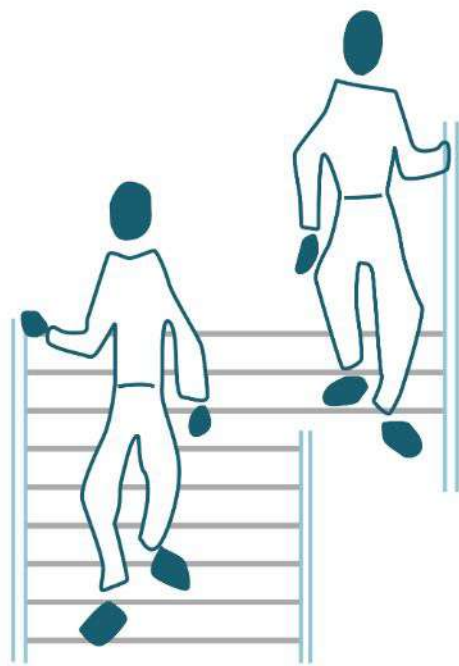
- With this theater, we tried to make a building where people can enjoy music and performances and forget their problems for a moment
- The floorplan is optimized for user experience taking into account the orientation and connection between the spaces
- The shape of the building is based on standard modules, improving the constructability
- The structures are compression based and able to withstand the loads
- Only local materials are used in the construction, making sure this is a building which can be realized



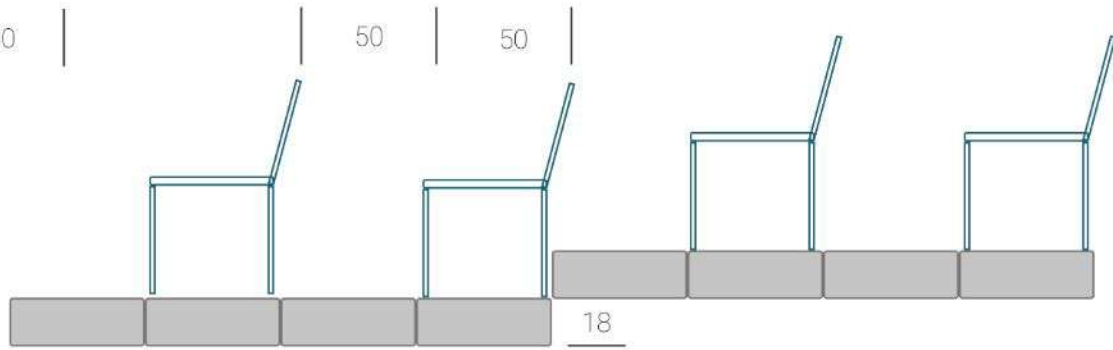
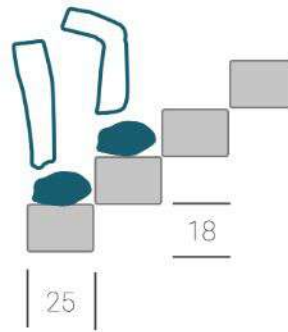
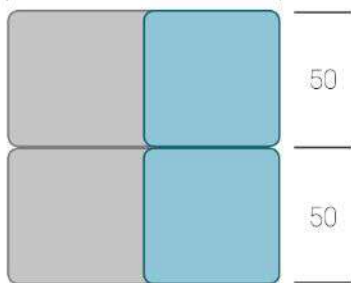








100 150





# References

materials



## Acoustics

- Thick walls insulate better because of their mass
- Minimize the openings at noise sensitive rooms
- Place and orientate the functions such that their sound is not interfering
- Make surfaces rough to minimize reflection

