

# **AFFORDABLE, DURABLE, MODULAR AND EXTENDABLE "NUBIAN VAULT" HOUSING**

A catalogue  
for actors of the NV eco-construction sector  
in the Sahel



## INTRODUCTION

This catalogue presents the principle features of a housing model which is affordable, durable, modular and extendable, based on the Nubian Vault (NV) technical concept of construction. Its purpose is to help actors of the NV sector in the Sahel, especially NV artisans and entrepreneurs and their clients, to take decisions on the choice of different NV housing plans and associated materials requirements.

The FIRST SECTION of the catalogue is a comprehensive description of the housing model, each sub-section corresponding to a phase of a NV construction project: understanding the technical concept > choice of the quality of finish > choice of specific housing plans and layout options.

The SECOND SECTION provides an opportunity, case by case, to think about the layout of a construction plot and the ways in which future extensions of a NV house can be anticipated. A specific example is provided for a 300 m<sup>2</sup> plot (15 X 20 m), growing from an initial 20 m<sup>2</sup> house, in six successive stages, to one with 112 m<sup>2</sup> of floor space.

Finally, the THIRD SECTION looks at the potential of using the NV model in pilot housing estates, eco-villages and neighbourhood projects.

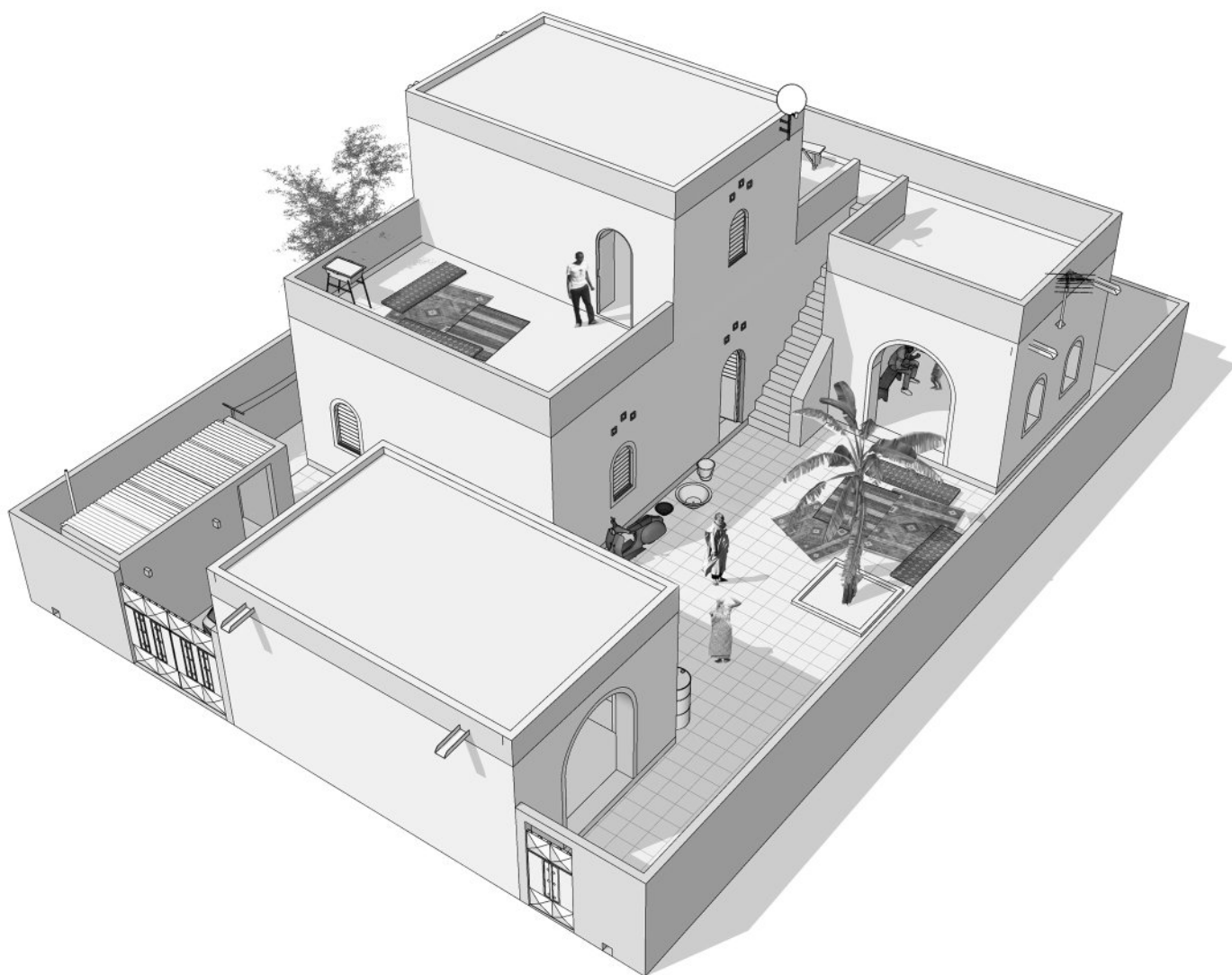
### BE AWARE !

Note that this document illustrates outlines of a range of possible NV house designs. An actual construction project requires not only a team of qualified specialist NV masons but also access to the available complementary technical documentation, including:

- technical dossiers corresponding to each type of module, covering the implementation process and calculation of materials quantities;
- the Professional Rules of the Nubian Vault technical concept, produced by the Nubian Vault Association, in particular the Nubian Vault Mason's Manual (2018).



*Ownership of a solid, comfortable "green" home at a competitive price is possible with the popular, durable, modular and extendable Nubian Vault housing.*





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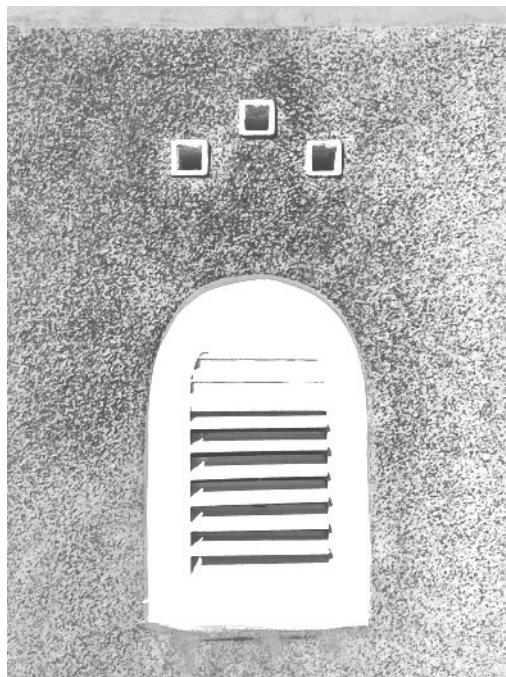
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+ Single 1st Floor Module + Balustrade / 112 m<sup>2</sup>

### ***NEIGHBOURHOOD INTERVENTIONS***

#### **5. Housing estates, eco-villages...**

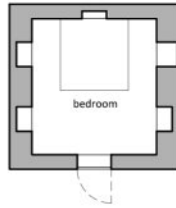
# THE MODULES, LAYOUT OPTIONS AND FINISHES



# 1.1 BASIC PRINCIPLES THE DIFFERENT MODULES

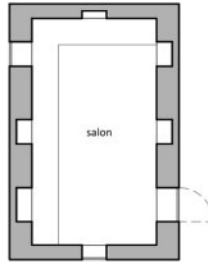
HALF MODULE - OPTION 1

HABITABLE SPACE = 12 m<sup>2</sup>



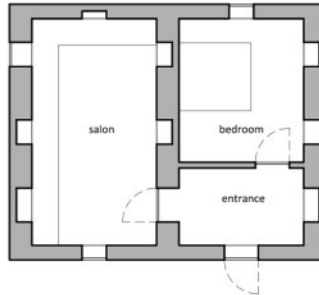
SINGLE MODULE - OPTION 1

HABITABLE SPACE = 20 m<sup>2</sup>



DOUBLE MODULE - OPTION 1

HABITABLE SPACE = 40 m<sup>2</sup>



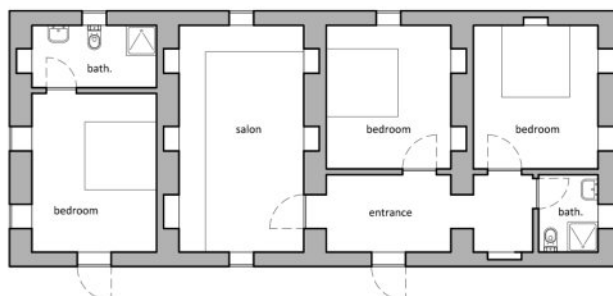
TRIPLE MODULE - OPTION 1

HABITABLE SPACE = 60 m<sup>2</sup>



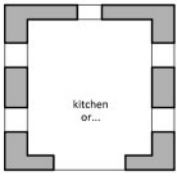
QUADRUPLE MODULE - OPTION 1

HABITABLE SPACE = 80 m<sup>2</sup>



# 1.2 BASIC PRINCIPLES THE DIFFERENT LAYOUT OPTIONS

## HALF MODULE - OPTION 2



These do not include all the layout options. They cover the main requirements, but other options are possible...

## SINGLE MODULE - OPTIONS

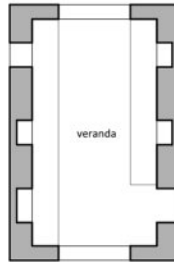
2



3



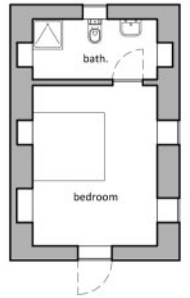
4



5



6



## DOUBLE MODULE - OPTIONS

2



3

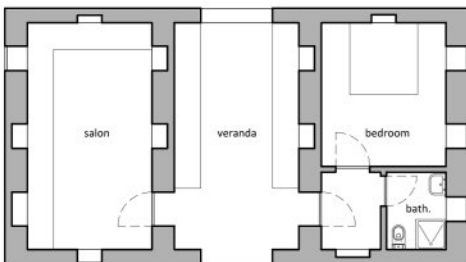


4



## TRIPLE MODULE - OPTIONS

2

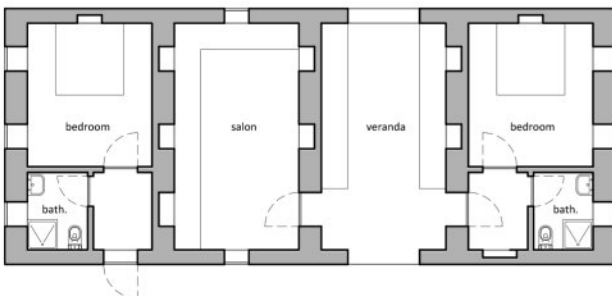


3



## QUADRUPLE MODULE - OPTIONS

2



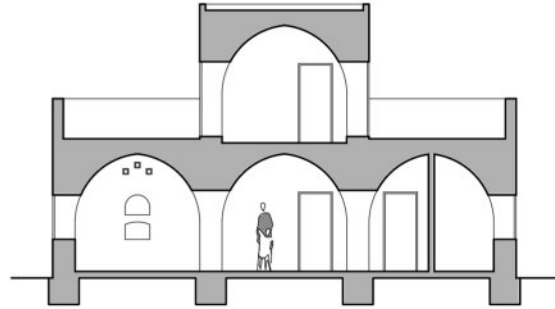
3



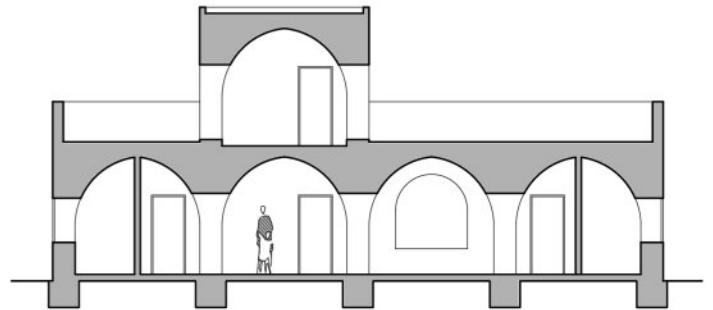
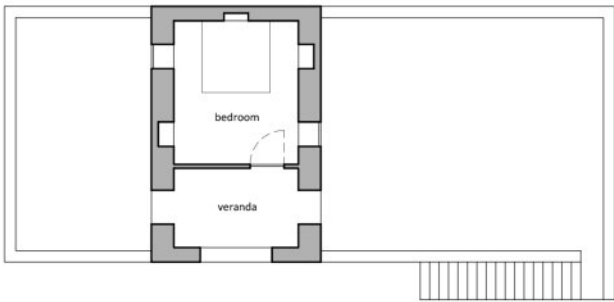
# 1.3 BASIC PRINCIPLES UPPER STOREY EXTENSIONS

Floor partitions > lightweight partitions required !!!

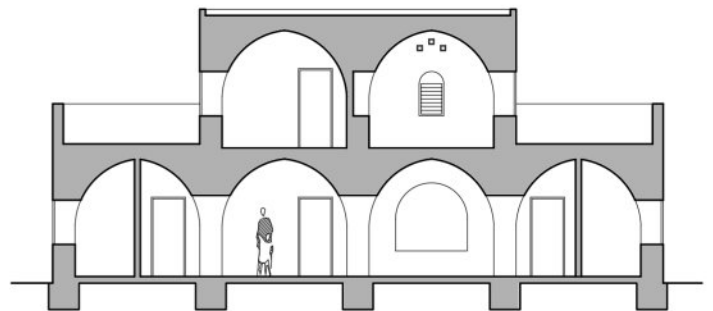
TRIPLE MODULE + STAIRCASE + SINGLE MODULE  
HABITABLE SPACE = 80 m<sup>2</sup>



QUADRUPLE MODULE + STAIRCASE + SINGLE MODULE  
HABITABLE SPACE = 100 m<sup>2</sup>



QUADRUPLE MODULE + STAIRCASE + DOUBLE MODULE  
HABITABLE SPACE = 120 m<sup>2</sup>





## 1.4 BASIC PRINCIPLES STAIRCASES AND BALUSTRADES

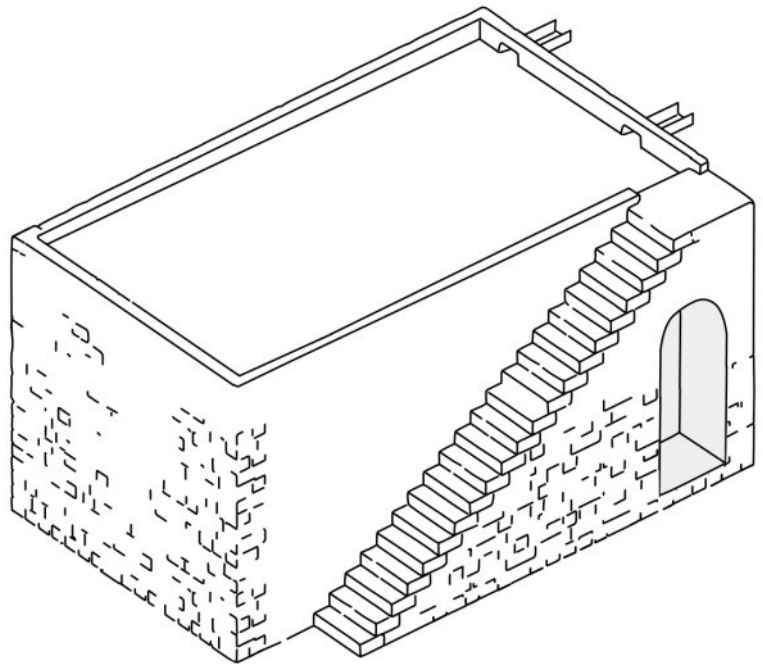
### MASONRY EXTERNAL STAIRCASE

The staircase gives access to the roof.

It is made with mud bricks.

The steps and risers are reinforced with concrete.

Its shape should be adapted to the specific situation, as advised by the NV artisan in charge.

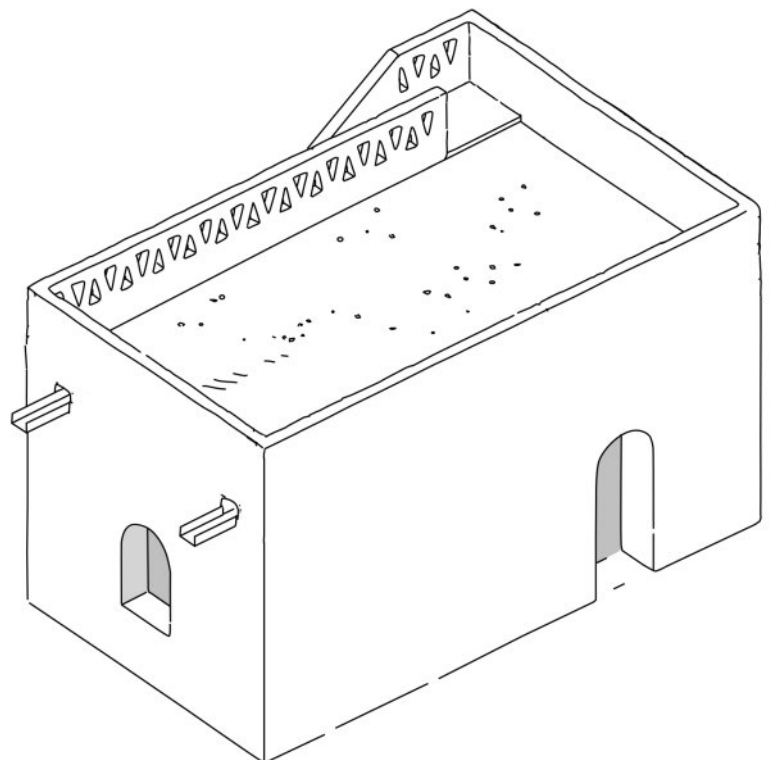


### MASONRY BALUSTRADE

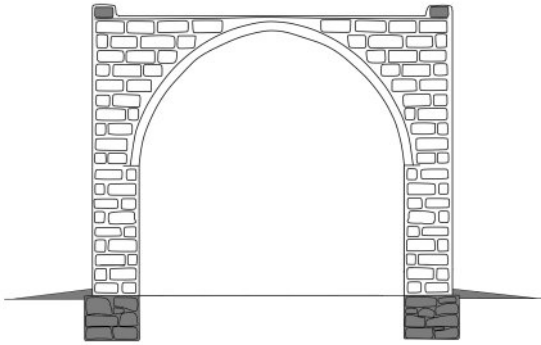
The balustrade provides safety for an accessible roof space.

It is made from mud bricks topped with concrete slabs.

Its form and style should be adapted to the specific situation, as advised by the NV artisan in charge.

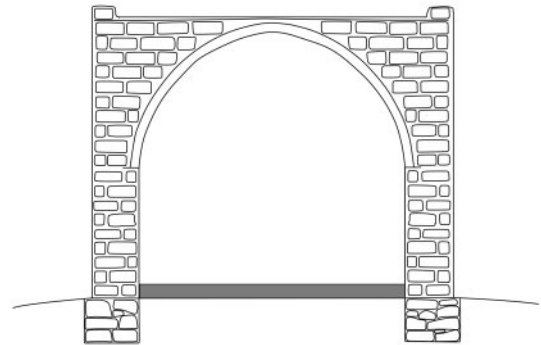


## 2.1 CHOICE OF QUALITY OF FINISH LOW COST VERSION



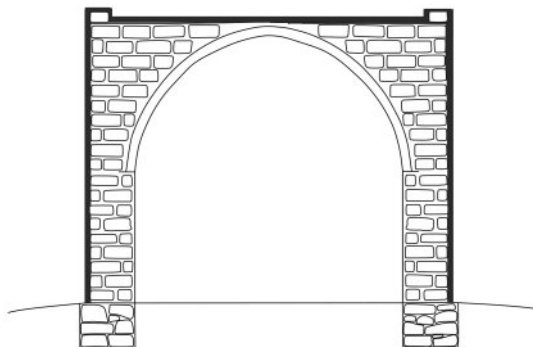
### WALL FOOTINGS AND HEADERS

- > Foundations of rocks and earth mortar+ damp proofing + rammed earth periphery
- > Rampart of adobes + concrete slabs



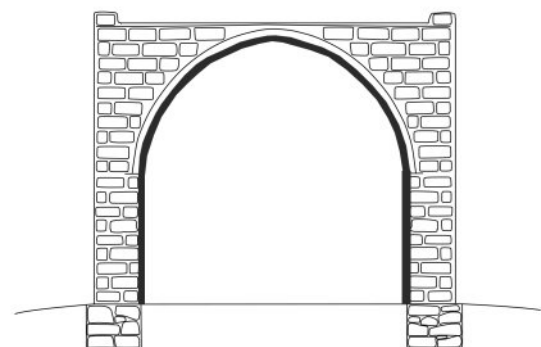
### FLOOR

- > Backfill: earth or compacted rubble
- > Finish: sand



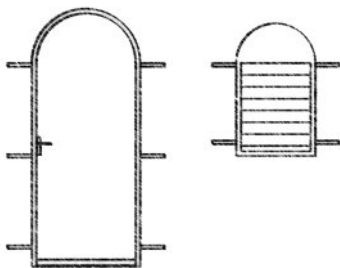
### EXTERNAL RENDERS

- > Walls: sand - cement tyrolean finish or mud - sand - bitumen with paint finish
- > Roof: mud - sand - gravel - bitumen



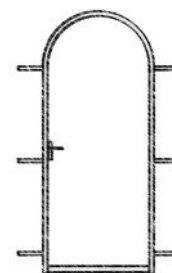
### INTÉRIOR RENDERS

- > Walls and vaults: Mud - sand - lime wash finish



### EXTERNAL DOORS AND WINDOWS

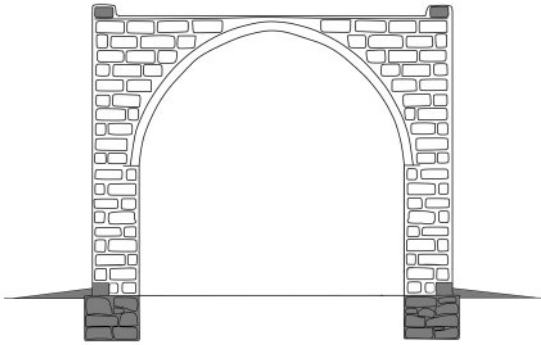
- > Doors: iron, flush to outside of wall
- > Windows: iron, flush to outside of wall, with adjustable louvres



### INTERNAL DOORS

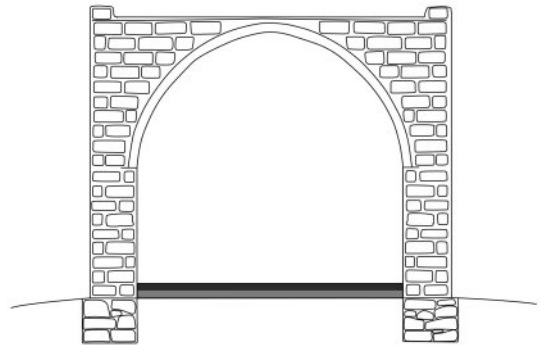
- > Iron

## 2.2 CHOICE OF QUALITY OF FINISH BASIC VERSION



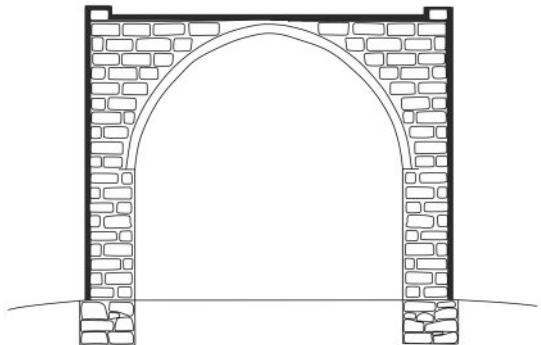
### WALL FOOTINGS AND HEADERS

- > Foundations of rocks and earth mortar + damp proofing + half course of rocks and cement + rammed earth periphery
- > Rampart 15cm concrete blocks + top slabs



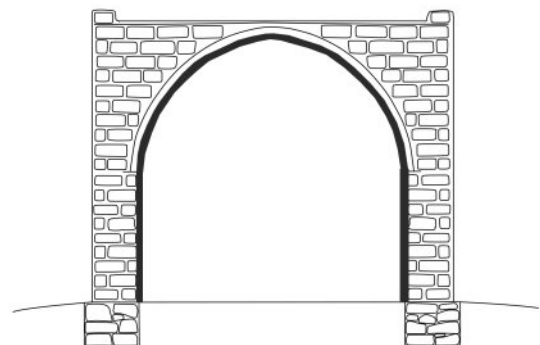
### FLOOR

- > Backfill: earth or compacted rubble
- > Finish: reinforced concrete slab



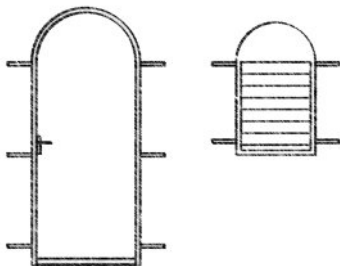
### EXTERNAL RENDERS

- > Walls: sand - cement tyrolean finish or mud - sand - bitumen with paint finish
- > Roof: mud - sand - gravel - bitumen



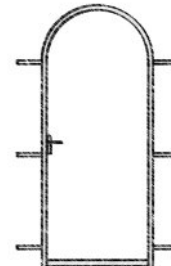
### INTERIOR RENDERS

- > Walls and vaults: mud - sand - lime wash finish



### EXTERNAL DOORS AND WINDOWS

- > Doors: iron, flush to outside of wall
- > Windows: iron, flush to outside of wall with adjustable louvres



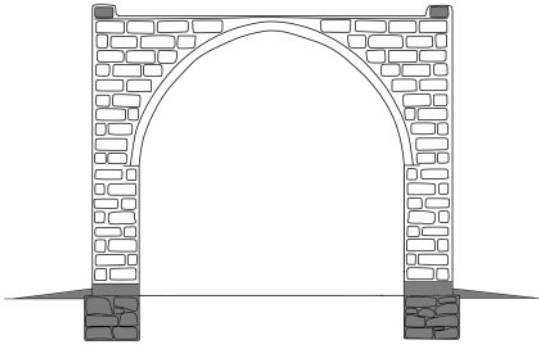
### INTERNAL DOORS

- > Iron

## 2.3

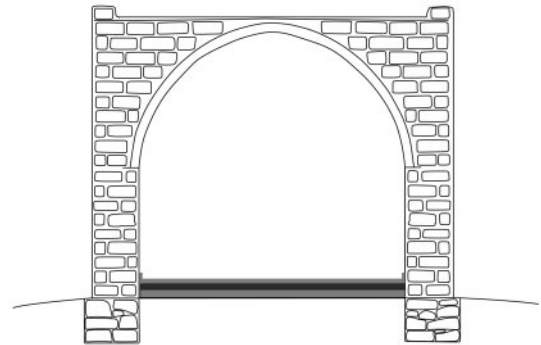
### CHOICE OF QUALITY OF FINISH

#### COMFORT VERSION



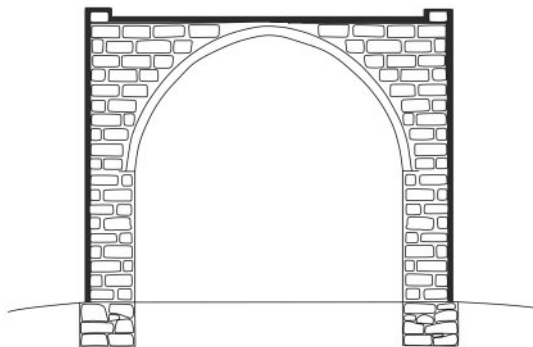
##### WALL FOOTINGS AND HEADERS

- > Foundations of rocks and earth mortar+ damp proofing + rammed earth periphery
- > Rampart of adobes + concrete slabs
- > Rampart 15cm concrete blocks + top slabs



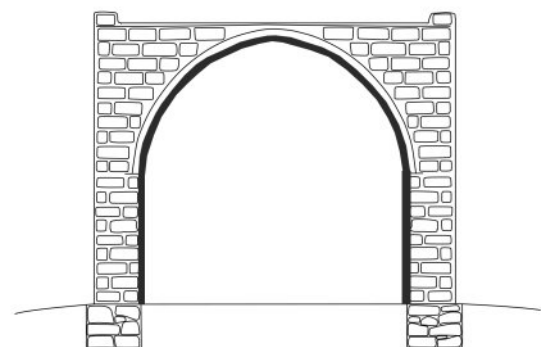
##### FLOOR

- > Backfill: earth or compacted rubble
- > Finish: reinforced concrete slab + floor tiles



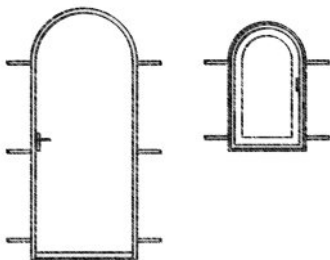
##### EXTERNAL RENDERS

- > Walls: sand - cement tyrolean finish or mud - sand - bitumen with paint finish
- > Roof: mud - sand - gravel - bitumen



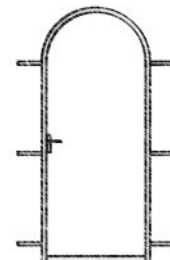
##### INTERIOR RENDERS

- > Vaults: Mud - sand - lime wash finish
- > Walls: sand - cement paint finish



##### EXTERNAL DOORS AND WINDOWS

- > Doors: iron, flush to inside of wall
- > Windows: iron frame, aluminium window, flush to inside of wall

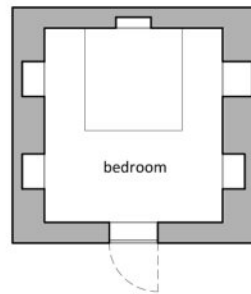


##### INTERNAL DOORS

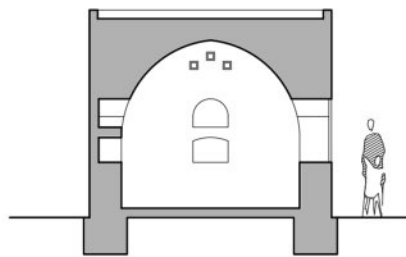
- > Doors : frame and door iron, or iron frame with wooden door

**3.1**  
CHOICE OF MODULES AND LAYOUTS  
**HALF MODULE / OPTION 1**

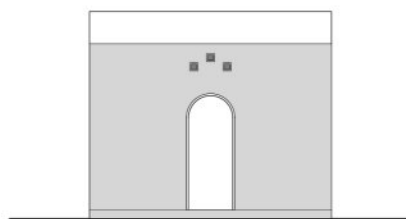
Bedroom  
12 m<sup>2</sup> habitable space (3m60 x 3m30)



PLAN



CROSS SECTION



MAIN ELEVATION



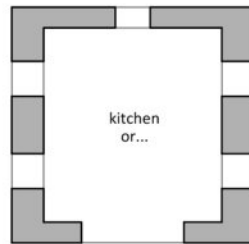
REAR ELEVATION



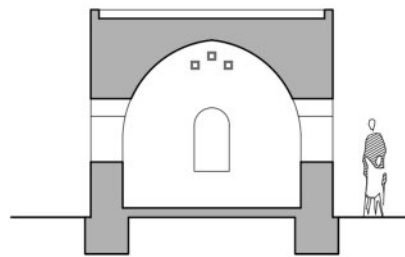
### 3.2

## CHOICE OF MODULES AND LAYOUTS HALF MODULE / OPTION 2

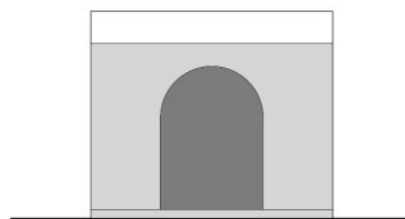
External kitchen or veranda ..  
12 m<sup>2</sup> habitable space (3m60 x 3m30)



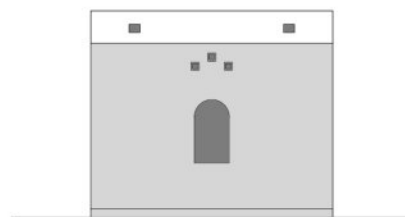
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

### 3.3 CHOICE OF MODULES AND LAYOUTS HALF MODULE / MATERIALS QUANTITIES

12 m2 habitable space (3m60 x 3m30)

	<b>LOW COST bitumen render on walls</b>	<b>BASIC sand-cement render on walls</b>	<b>COMFORT sand-cement render on walls</b>
<b>Rocks</b>	8,5 m3 48 carts	9 m3 50 carts	9,6 m3 54 carts
<b>Gravel</b>	0,7 m3 4 carts	2 m3 11 carts	3,4 m3 19carts
<b>Sand</b>	3,75 m3 21 carts	4,8 m3 27 carts	6,3 m3 35 carts
<b>Water</b>	22 m3 120 barrels (200L)	21 m3 105 barrels (200L)	20,5 m3 100 barrels (200L)
<b>Earth for mortar</b>	23 m3 128 carts	22,5 m3 125 carts	20 m3 112 carts
<b>Bricks 38x17x15</b>	1 955	1 875	1 875
<b>Bricks 28x17x15</b>	345	330	330
<b>Brickettes 25x15x5</b>	1 800	1 800	1 800
<b>Cement</b>	70 kg 2 X 50 kg bags	1 800 kg 36 X 50 kg bags	2 400 kg 48 X 50 kg bags
<b>Bitumen</b>	82 kg	30 kg	30 kg
<b>Plastic film</b>	40 metres	40 metres	40 metres
<b>15cm breeze blocks</b>	-	100	100
<b>Claustras</b>	18	18	18
<b>Wire mesh (if used for render)</b>	-	45 metres	45 metres
<b>Rebar - iron rods</b>	12 kg	65 kg	65 kg
<b>Floor tiles (30x30)</b>	-	-	15 m2

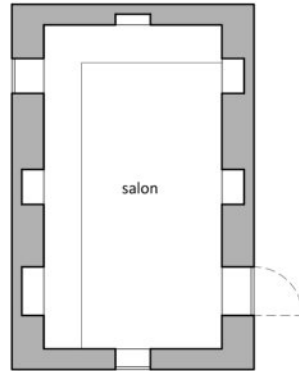
*Could be collected by the  
client or beneficiary*

*Could be made by the  
client or beneficiary*

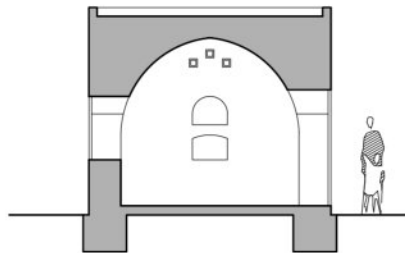
*Obligatory purchase*

**3.4**  
CHOICE OF MODULES AND LAYOUTS  
**SINGLE MODULE / OPTION 1**

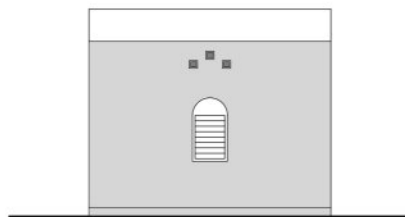
Salon  
20 m<sup>2</sup> habitable space (6m x 3m30)



PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

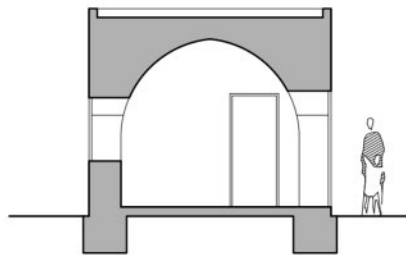
### 3.5

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / OPTION 2

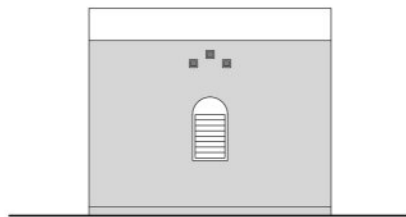
Bedroom + salon  
20 m<sup>2</sup> habitable space (6m x 3m30)



PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

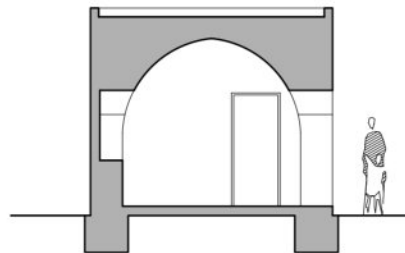
### 3.6

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / OPTION 3

Salon + veranda  
20 m<sup>2</sup> habitable space (6m x 3m30)



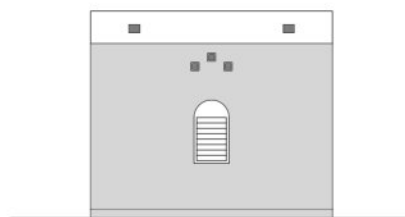
PLAN



CROSS SECTION



MAIN ELEVATION



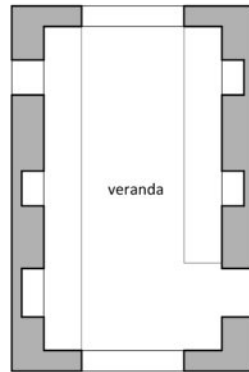
REAR ELEVATION



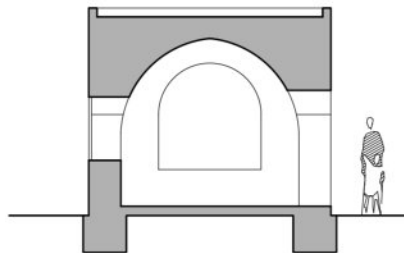
### 3.7

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / OPTION 4

Veranda  
20 m<sup>2</sup> habitable space (6m x 3m30)



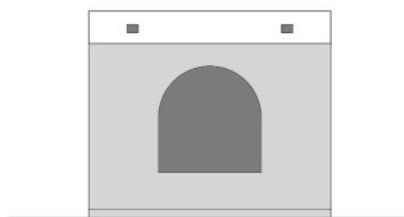
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

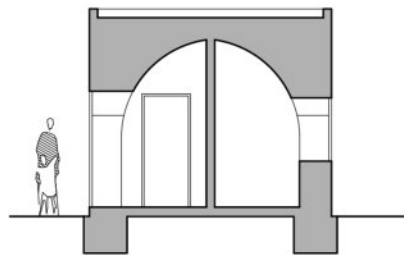
### 3.8

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / OPTION 5

Entrance + bedroom + bathroom  
20 m<sup>2</sup> habitable space (6m x 3m30)



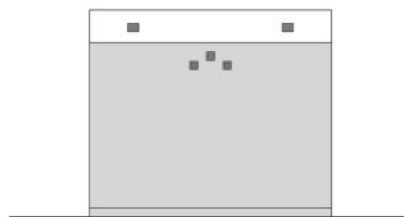
PLAN



CROSS SECTION



MAIN ELEVATION

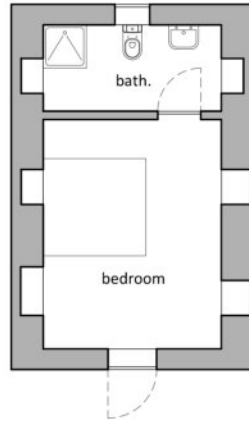


REAR ELEVATION

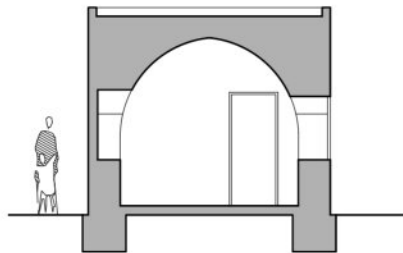
### 3.9

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / OPTION 6

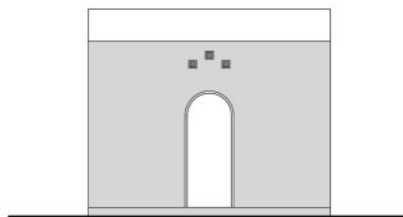
Bedroom + bathroom  
20 m<sup>2</sup> habitable space (6m x 3m30)



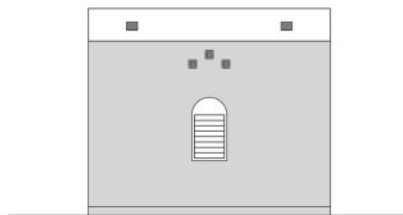
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

### 3.10

## CHOICE OF MODULES AND LAYOUTS SINGLE MODULE / MATERIALS QUANTITIES

20 m2 habitable space (6m x 3m30)

	<b>LOW COST</b> bitumen render on walls	<b>BASIC</b> sand-cement render on walls	<b>COMFORT</b> sand-cement render on walls
<b>Rocks</b>	11,5 m3 64 carts	12,5 m3 70 carts	13 m3 / 73 carts
<b>Gravel</b>	1 m3 6 carts	4 m3 22 carts	5.8 m3 / 33 carts
<b>Sand</b>	5,5 m3 31 carts	8 m3 45 carts	10 m3 56 carts
<b>Water</b>	31 m3 155 barrels (200L)	30,5 m3 153 barrels (200L)	30 m3 150 barrels (200L)
<b>Earth for mortar</b>	33 m3 184 carts	32 m3 178 carts	27,5 m3 153 carts
<b>Bricks 38x17x15</b>	2 790	2 590	2 470
<b>Bricks 28x17x15</b>	495	460	435
<b>Brickettes 25x15x5</b>	2 970	2 970	2 970
<b>Cement</b>	80 kg 2 X 50kg bags	3 050 kg 61 X 50kg bags	3 900 kg 78 X 50kg bags
<b>Bitumen</b>	110 kg	45 kg	45 kg
<b>Plastic film</b>	60 metres	60 metres	60 metres
<b>15cm breeze blocks</b>	-	240	240
<b>Claustras</b>	18	18	18
<b>Wire mesh (if used for render)</b>	-	56 metres	56 metres
<b>Rebar - iron rods</b>	15 kg	102 kg	102 kg
<b>Floor tiles (30x30)</b>	-	-	23 m2

*Could be collected by the  
client or beneficiary*

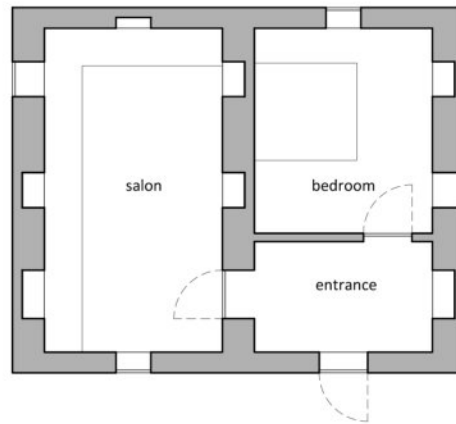
*Could be made by the  
client or beneficiary*

*Obligatory purchase*

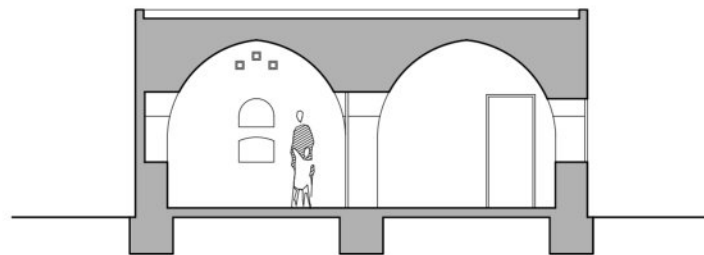
### 3.11

#### CHOICE OF MODULES AND LAYOUTS **DOUBLE MODULE / OPTION 1**

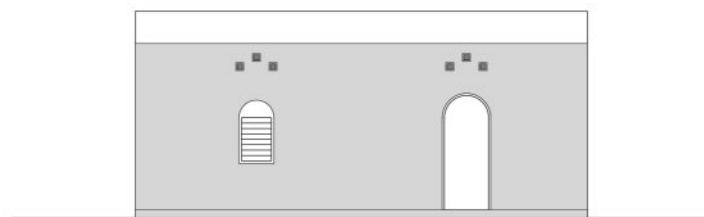
Entrance + bedroom + salon  
40 m2 habitable space (6m x 3m30 x 2)



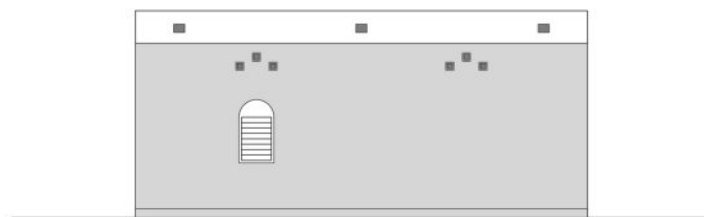
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION



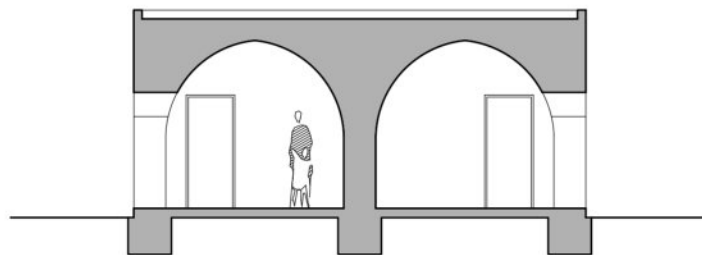
### 3.12

## CHOICE OF MODULES AND LAYOUTS DOUBLE MODULE / OPTION 2

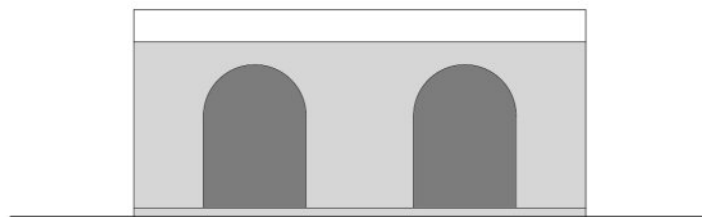
2 verandas + 2 bedrooms  
40 m<sup>2</sup> habitable space (6m x 3m30 x 2)



PLAN



CROSS SECTION



MAIN ELEVATION

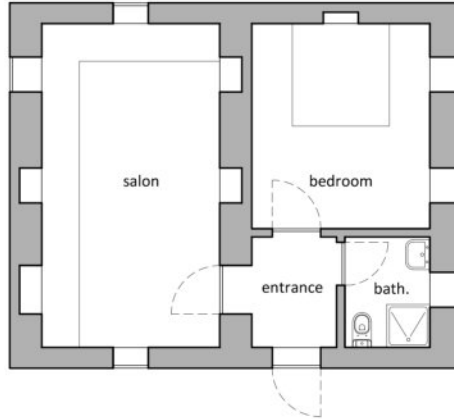


REAR ELEVATION

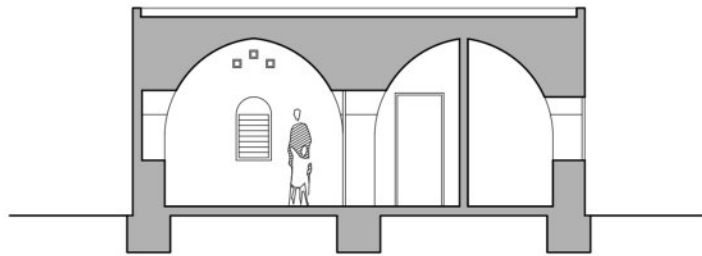
### 3.13

#### CHOICE OF MODULES AND LAYOUTS **DOUBLE MODULE / OPTION 3**

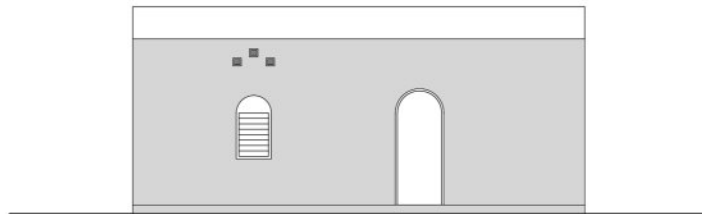
Entrance + bedroom + salon + bathroom  
40 m<sup>2</sup> habitable space (6m x 3m30 x 2)



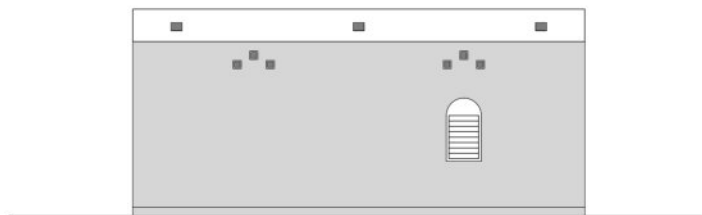
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

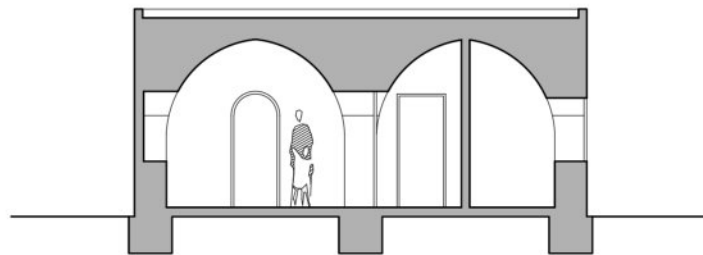
### 3.14

#### CHOICE OF MODULES AND LAYOUTS **DOUBLE MODULE / OPTION 4**

Veranda + bedroom + salon + bathroom  
40 m<sup>2</sup> habitable space (6m x 3m30 x 2)



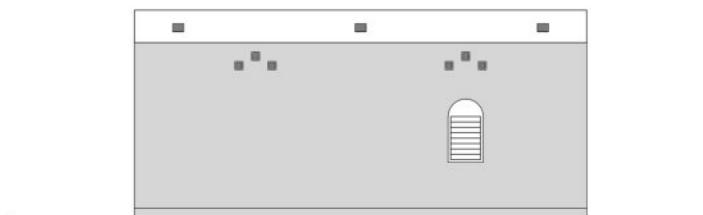
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

### 3.15

## CHOICE OF MODULES AND LAYOUTS

# DOUBLE MODULE / MATERIALS QUANTITIES

40 m2 habitable space (6m x 3m30 x 2)

	LOW COST bitumen render on walls	BASIC sand-cement render on walls	COMFORT sand-cement render on walls
<b>Rocks</b>	18,7 m3 104 carts	19,5 m3 / 109 carts	23,5 m3 131 carts
<b>Gravel</b>	1,8 m3 10 carts	5,7 m3 32 carts	9,2 m3 53 carts
<b>Sand</b>	9,2 m3 51 carts	11,8 m3 66 carts	15,8 m3 89 carts
<b>Water</b>	55 m3 285 barrels (220L)	54 m3 270 barrels (220L).	53,5 m3 265 barrels (220L).
<b>Earth for mortar</b>	57,5 m3 320 carts	55,5 m3 309 carts	49 m3 273 carts
<b>Bricks 38x17x15</b>	4 725	4 485	4 285
<b>Bricks 28x17x15</b>	835	795	755
<b>Brickettes 25x15x5</b>	5 895	5 895	5 895
<b>Cement</b>	120 kg 3 X 50 kg bags	4 300 kg 86 X 50 kg bags	6 050 kg 121 X 50 kg bags
<b>Bitumen</b>	175 kg	85 kg	85 kg
<b>Plastic film</b>	100 metres	100 metres	100 metres
<b>15cm breeze blocks</b>	-	285	285
<b>Claustras</b>	28	28	28
<b>Wire mesh (if used for render)</b>	-	75 metres	75 metres
<b>Rebar - iron rods</b>	22 kg	195 kg	195 kg
<b>Floor tiles (30x30)</b>	-	-	46 m2

*Could be collected by the client or beneficiary*

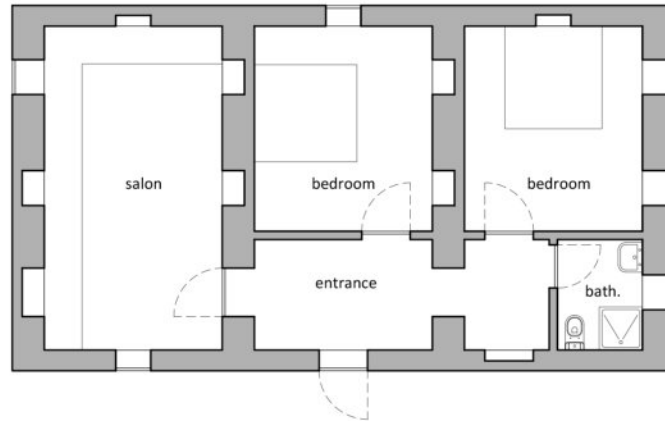
*Could be made by the client or beneficiary*

*Obligatory purchase*

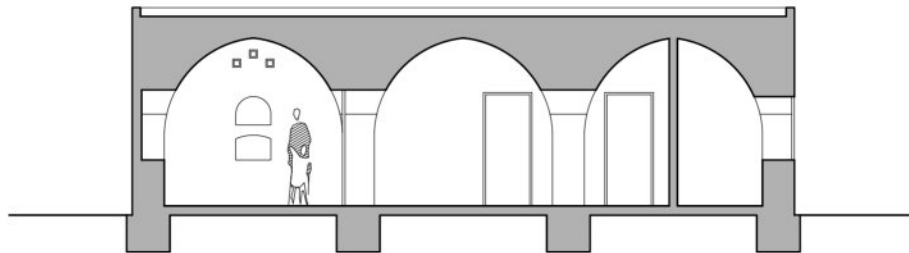
### 3.16

## CHOICE OF MODULES AND LAYOUTS TRIPLE MODULE / OPTION 1

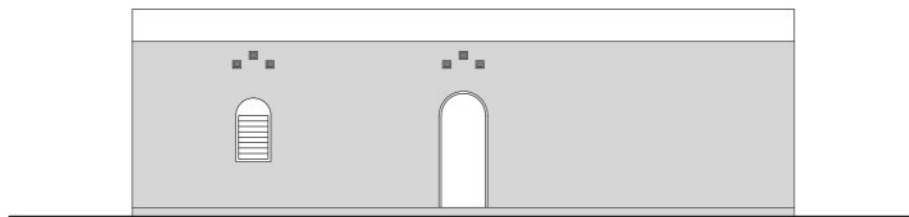
Entrance + 2 bedrooms + salon + bathroom  
60 m<sup>2</sup> habitable space (6m x 3m30 x 3)



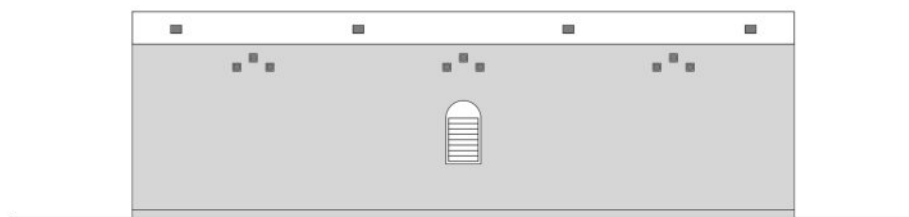
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

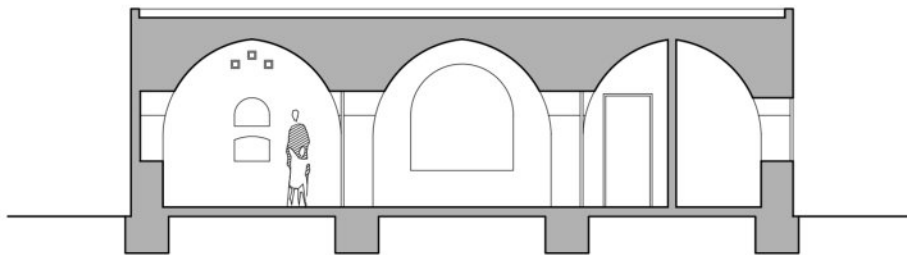
### 3.17

## CHOICE OF MODULES AND LAYOUTS TRIPLE MODULE / OPTION 2

Veranda + bedroom + salon + bathroom  
60 m<sup>2</sup> habitable space (6m x 3m30 x 3)



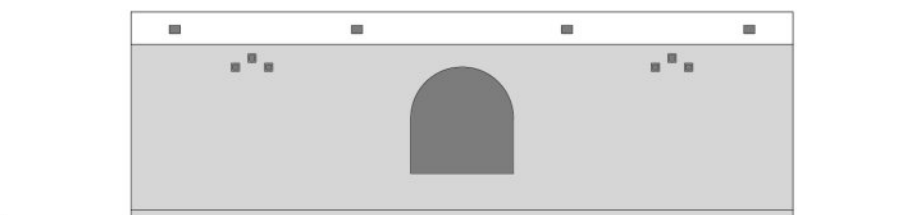
PLAN



CROSS SECTION



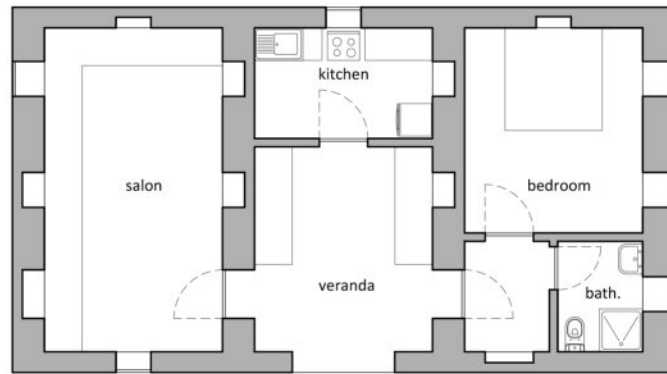
MAIN ELEVATION



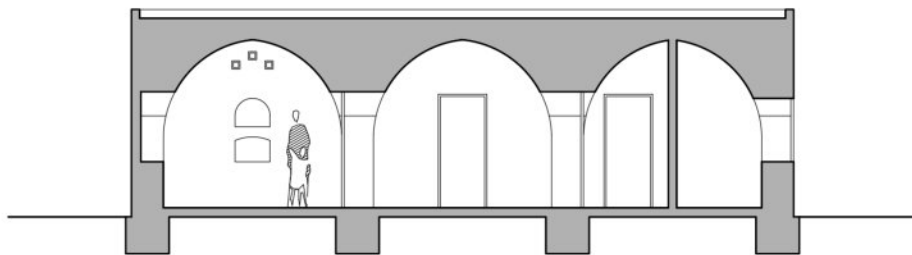
REAR ELEVATION

**3.18**  
**CHOICE OF MODULES AND LAYOUTS**  
**TRIPLE MODULE / OPTION 3**

Veranda + bedroom + salon + kitchen + bathroom  
60 m<sup>2</sup> habitable space (6m x 3m30 x 3)



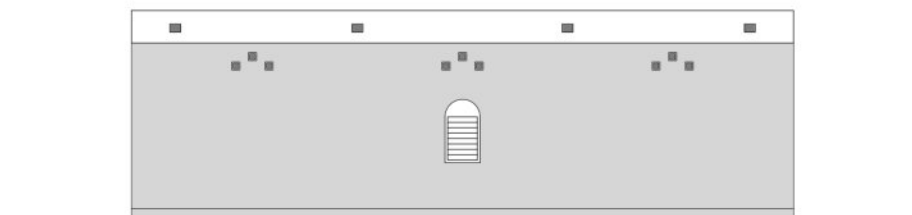
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

### 3.19

## CHOICE OF MODULES AND LAYOUTS TRIPLE MODULE / MATERIALS QUANTITIES

60 m2 habitable space (6m x 3m30 x 3)

	<b>LOW COST bitumen render on walls</b>	<b>BASIC sand-cement render on walls</b>	<b>COMFORT sand-cement render on walls</b>
<b>Rocks</b>	25,8 m3 144 carts	27 m3 150 carts	32,8 m3 183 carts
<b>Gravel</b>	2,6 m3 15 carts	8,7 m3 49 carts	13,5 m3 75 carts
<b>Sand</b>	13,2 m3 74 carts	17,5 m3 98 carts	23,2 m3 129 carts
<b>Water</b>	78 m3 390 barrels (200L)	76,5 m3 390 barrels (200L)	75 m3 375 barrels (200L)
<b>Earth for mortar</b>	81,5 m3 453 carts	78,5 m3 436 carts	69,2 m3 385 carts
<b>Bricks 38x17x15</b>	6 560	6 150	5 870
<b>Bricks 28x17x15</b>	1 160	1 085	1 040
<b>Brickettes 25x15x5</b>	8 865	8 865	8 865
<b>Cement</b>	180 kg 4 X 50 kg bags	6 400 kg 128 X 50 kg bags	8 600 kg 172 X 50 kg bags
<b>Bitumen</b>	235 kg	120 kg	120 kg
<b>Plastic film</b>	150 metres	150 metres	150 metres
<b>15cm breeze blocks</b>	-	455	455
<b>Claustras</b>	48	48	48
<b>Wire mesh (if used for render)</b>	-	95 metres	95 metres
<b>Rebar - iron rods</b>	27 kg	290 kg	290 kg
<b>Floor tiles (30x30)</b>	-	-	70 m2

*Could be collected by the  
client or beneficiary*

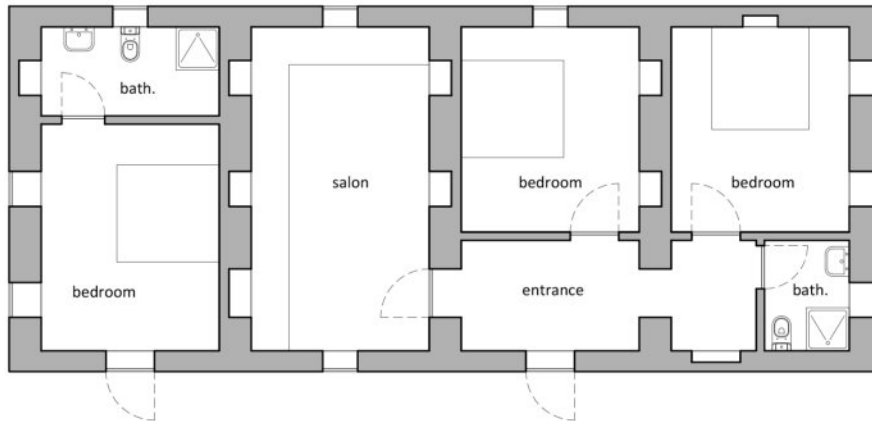
*Could be made by the  
client or beneficiary*

*Obligatory purchase*

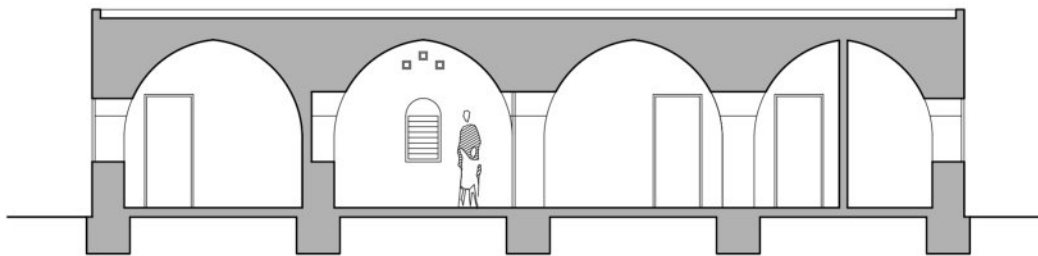


**3.20**  
CHOICE OF MODULES AND LAYOUTS  
**QUADRUPLE MODULE / OPTION 1**

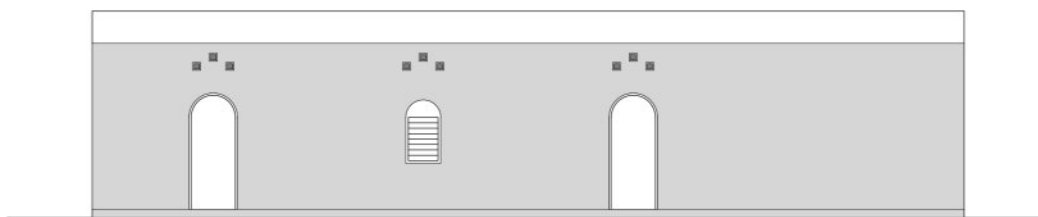
Entrance + salon + 3 bedrooms + 2 bathrooms  
80 m2 habitable space (6m x 3m30 x 4)



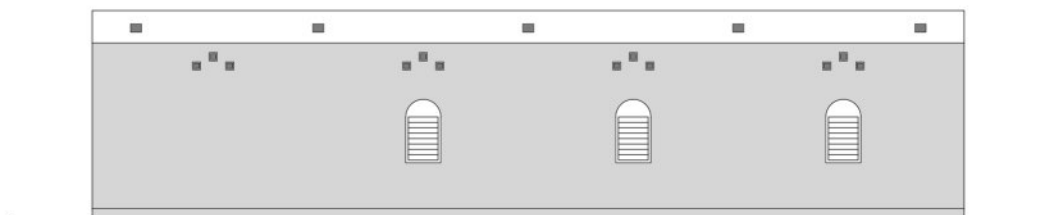
PLAN



CROSS SECTION



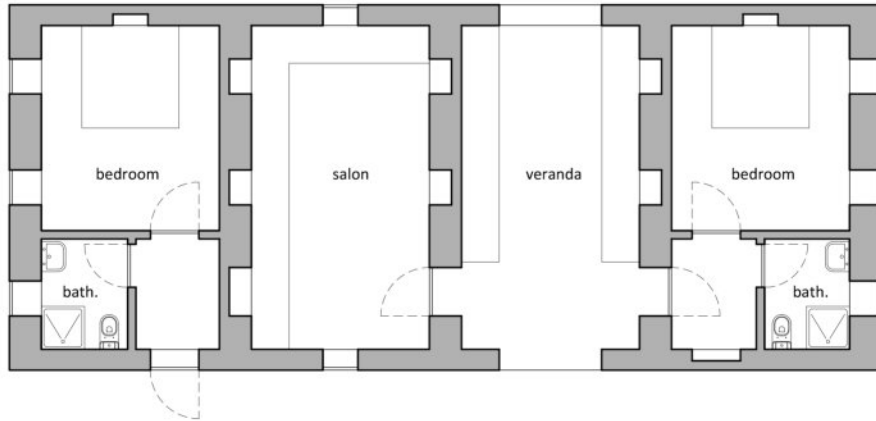
MAIN ELEVATION



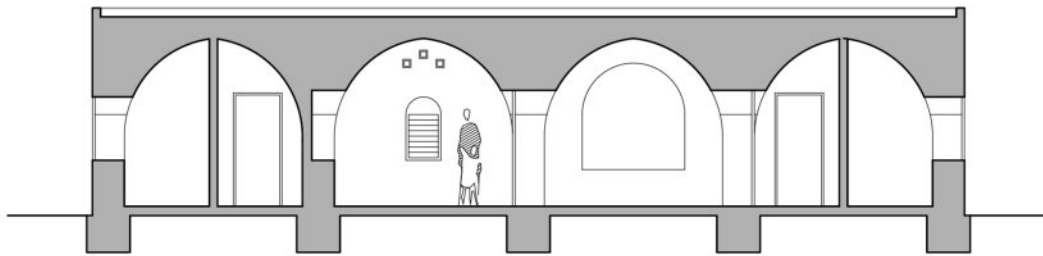
REAR ELEVATION

**3.21**  
CHOICE OF MODULES AND LAYOUTS  
**QUADRUPLE MODULE / OPTION 2**

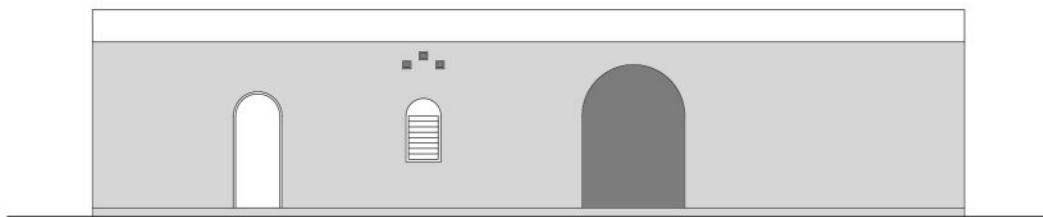
Veranda + salon + 2 bedrooms + 2 bathrooms  
80 m<sup>2</sup> habitable space (6m x 3m30 x 4)



PLAN



CROSS SECTION



MAIN ELEVATION



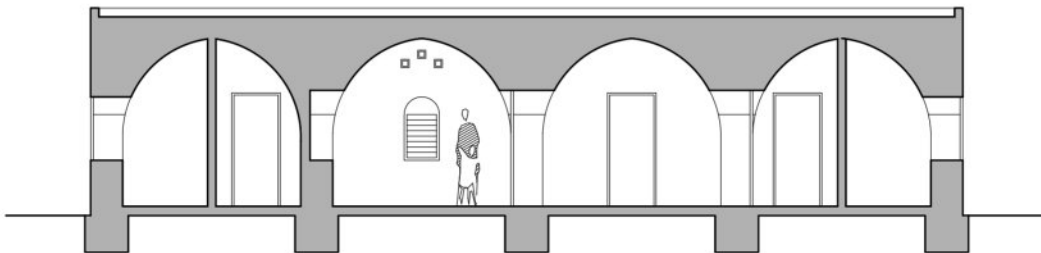
REAR ELEVATION

**3.22**  
CHOICE OF MODULES AND LAYOUTS  
**MODULE QUADRUPLE / OPTION 3**

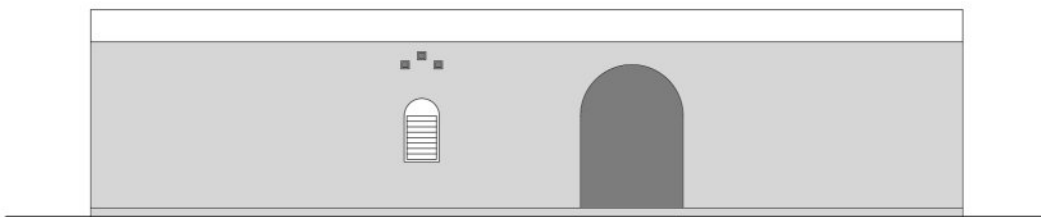
Veranda + salon + 2 bedrooms + 2 bathrooms + kitchen  
80 m2 habitable space (6m x 3m30 x 4)



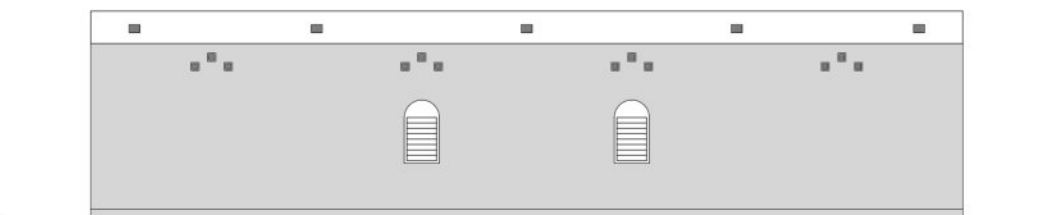
PLAN



CROSS SECTION



MAIN ELEVATION



REAR ELEVATION

### 3.23

## CHOICE OF MODULES AND LAYOUTS QUADRUPLE MODULE / MATERIALS QUANTITIES

80 m2 habitable space (6m x 3m30 x 4)

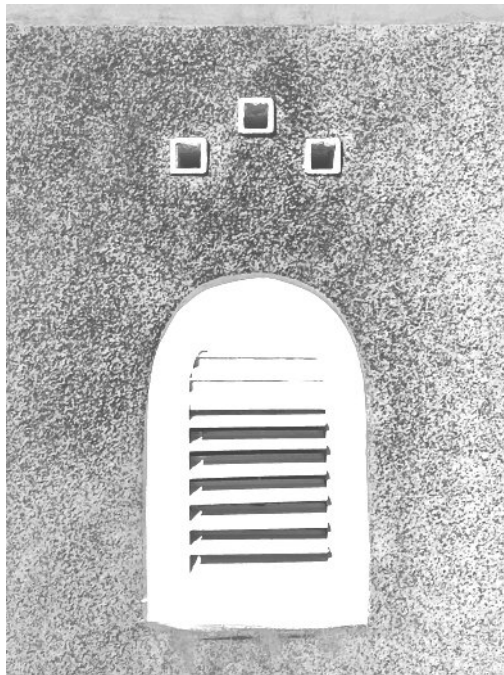
	LOW COST bitumen render on walls	BASIC sand-cement render on walls	COMFORT sand-cement render on walls
<b>Rocks</b>	33 m3 184 carts	34,5 m3 192 carts	42 m3 234 carts
<b>Gravel</b>	3,4 m3 19 carts	11,3 m3 63 carts	17,6 m3 98 carts
<b>Sand</b>	17 m3 95 carts	22,8 m3 127carts	30,2 m3 168 carts
<b>Water</b>	100 m3 510 barrels (200L)	98 m3 495 barrels (200L)	97 m3 490 barrels (200L)
<b>Earth for mortar</b>	105 m3 584 carts	101 m3 562 carts	89 m3 495 carts
<b>Bricks 38x17x15</b>	8 360	7 810	7 460
<b>Bricks 28x17x15</b>	1 475	1 380	1 320
<b>Brickettes 25x15x5</b>	11 785	11 785	11 785
<b>Cement</b>	210 kg 5 X 50 kg bags	8 300 kg 166 X 50 kg bags	11 250 kg 225 X 50 kg bags
<b>Bitumen</b>	295 kg	160 kg	160 kg
<b>Plastic film</b>	185 metres	185 metres	185 metres
<b>15cm breeze blocks</b>	-	595	595
<b>Claustras</b>	67	67	67
<b>Wire mesh (if used for render)</b>	-	115 metres	115 metres
<b>Rebar - iron rods</b>	33 kg	380 kg	380 kg
<b>Floor tiles (30x30)</b>	-	-	92 m2

*Could be collected by the  
client or beneficiary*

*Could be made by the  
client or beneficiary*

*Obligatory purchase*

# **PROGRESSIVE EXTENSIONS WITHIN A PLOT : AN EXAMPLE**



# 4.1

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

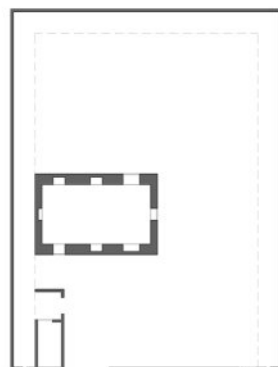
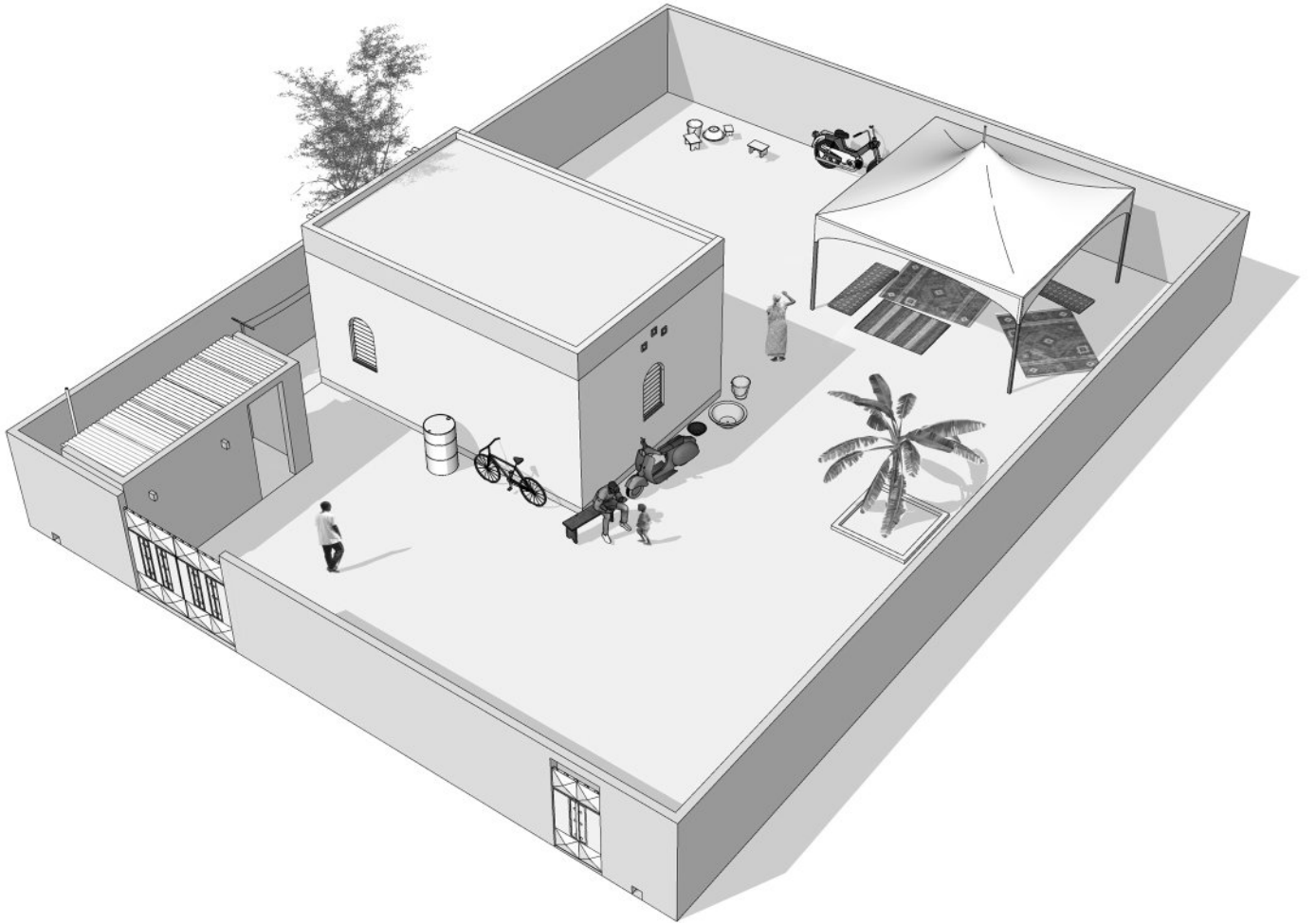
## PRINCIPAL RULES TO RESPECT



## 4.2

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

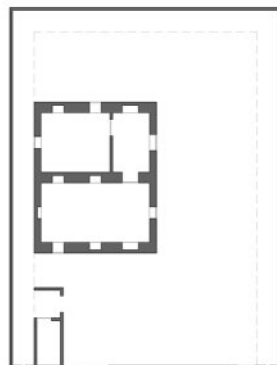
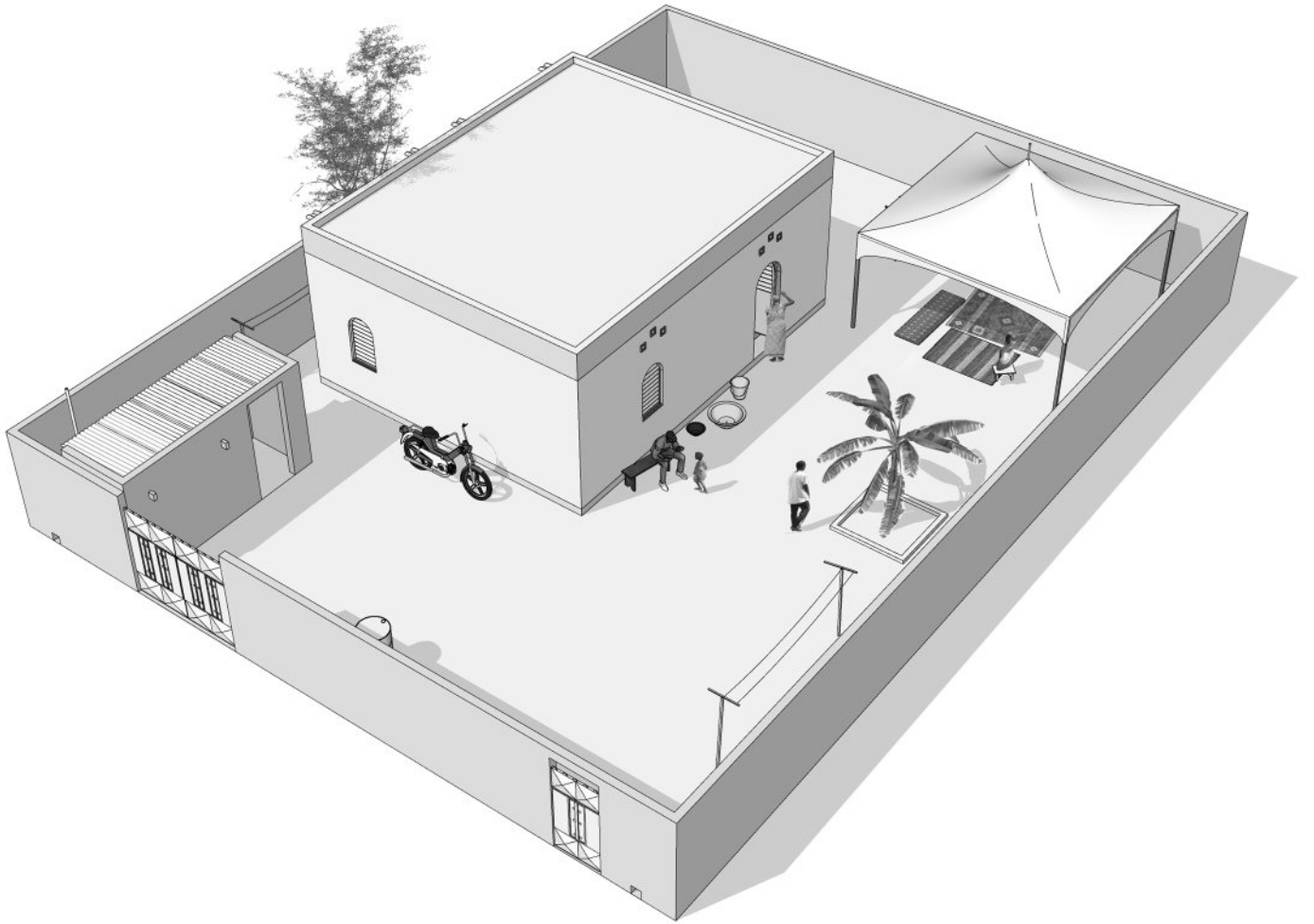
### PHASE 1 : SINGLE MODULE / 20 m<sup>2</sup>



### 4.3

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

### PHASE 2 : DOUBLE MODULE / 40 m<sup>2</sup>

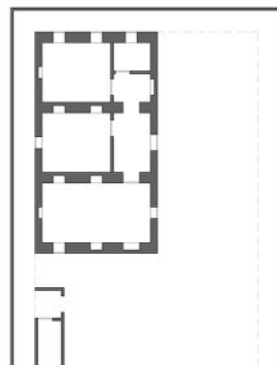
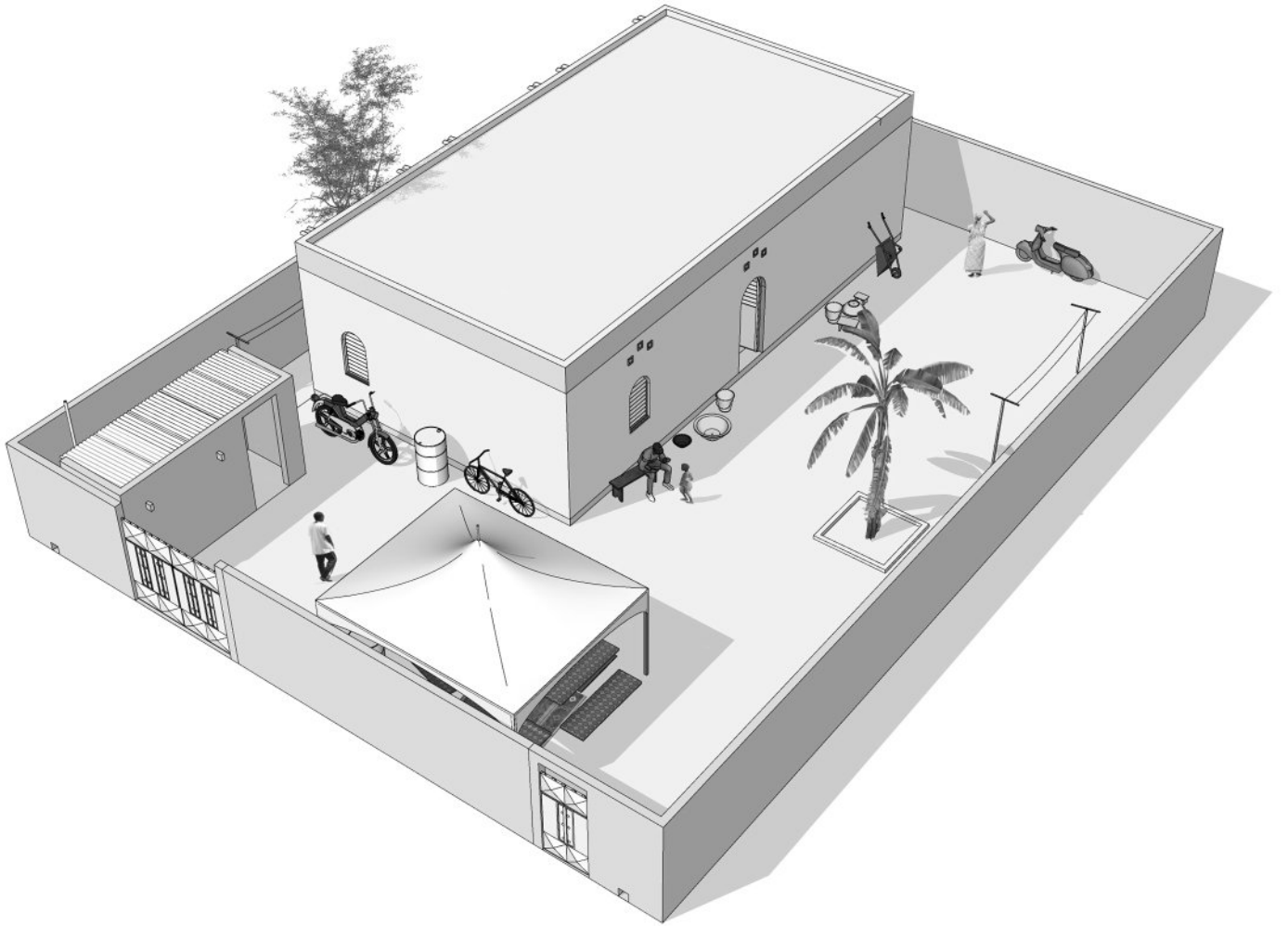




## 4.4

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

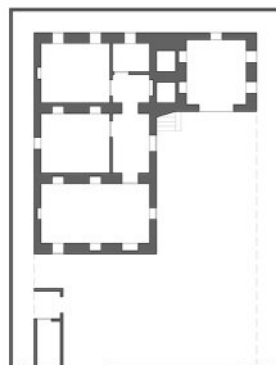
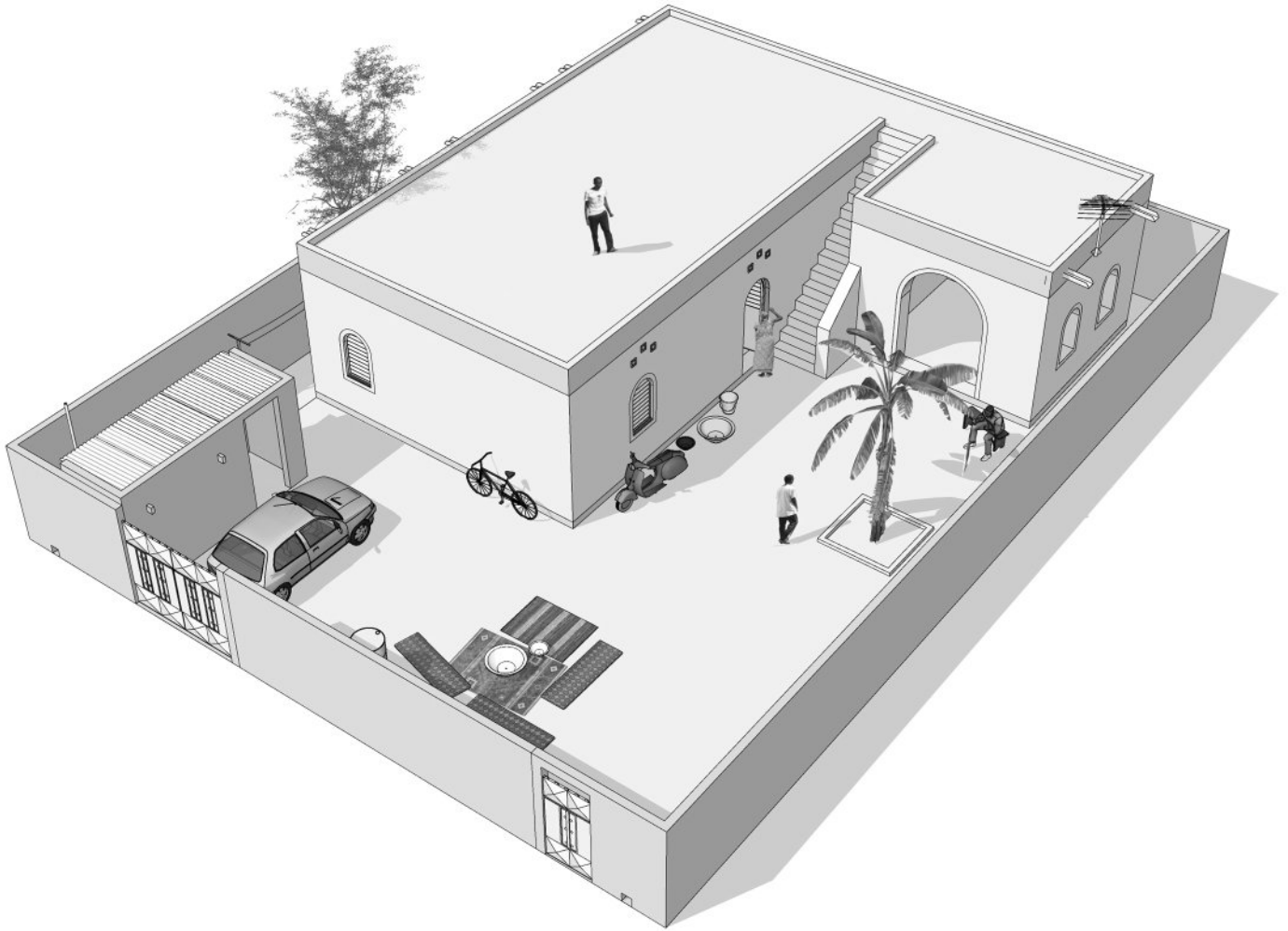
### PHASE 3 : TRIPLE MODULE / 60 m<sup>2</sup>



## 4.5

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

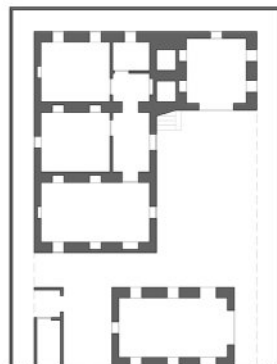
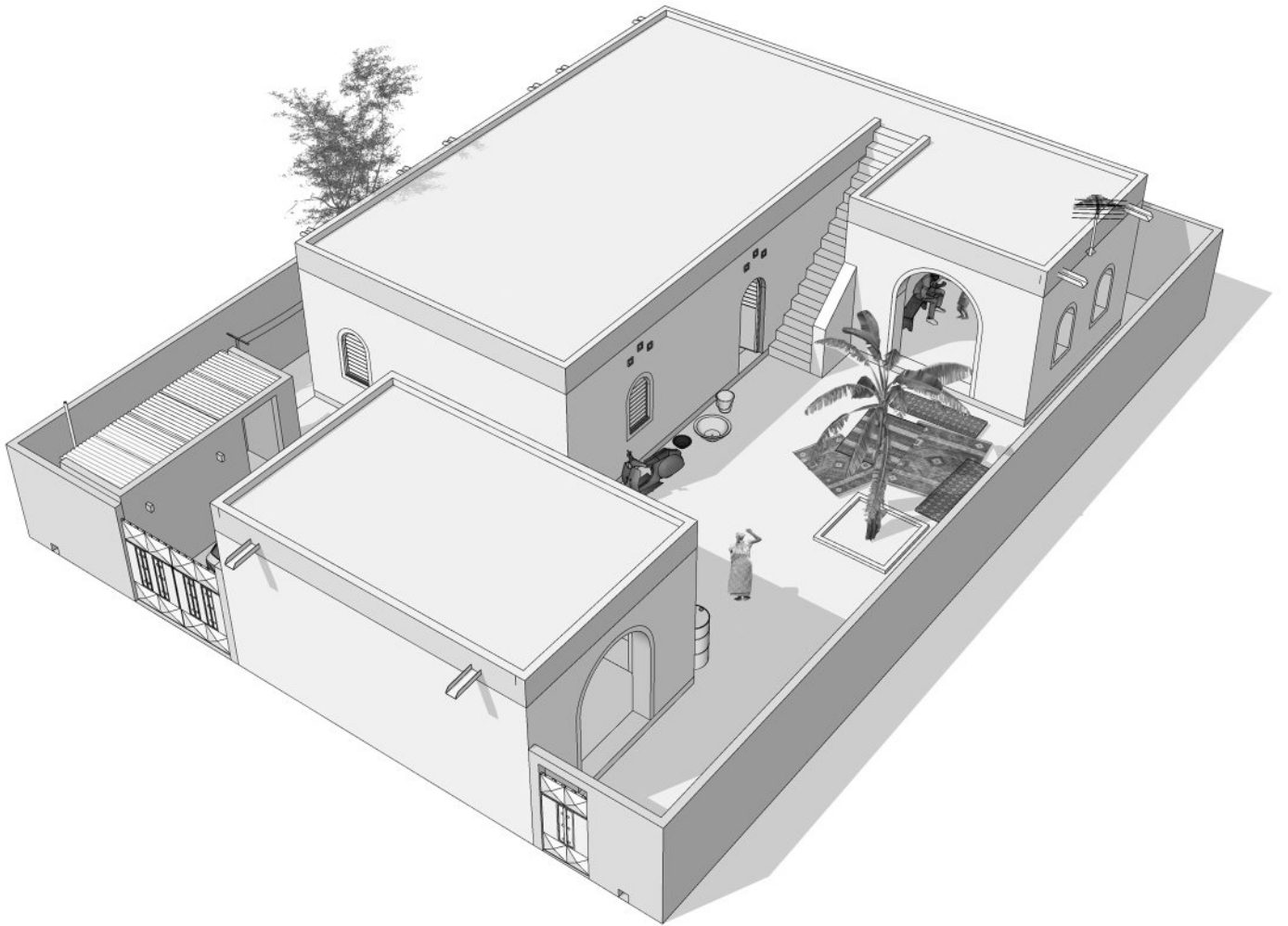
### PHASE 4 : TRIPLE MODULE + HALF MODULE + STAIRCASE / 72 m<sup>2</sup>



## 4.6

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

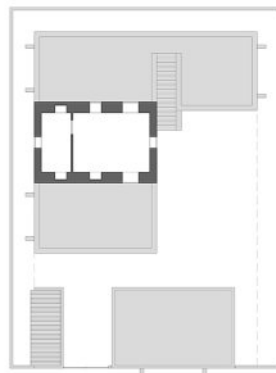
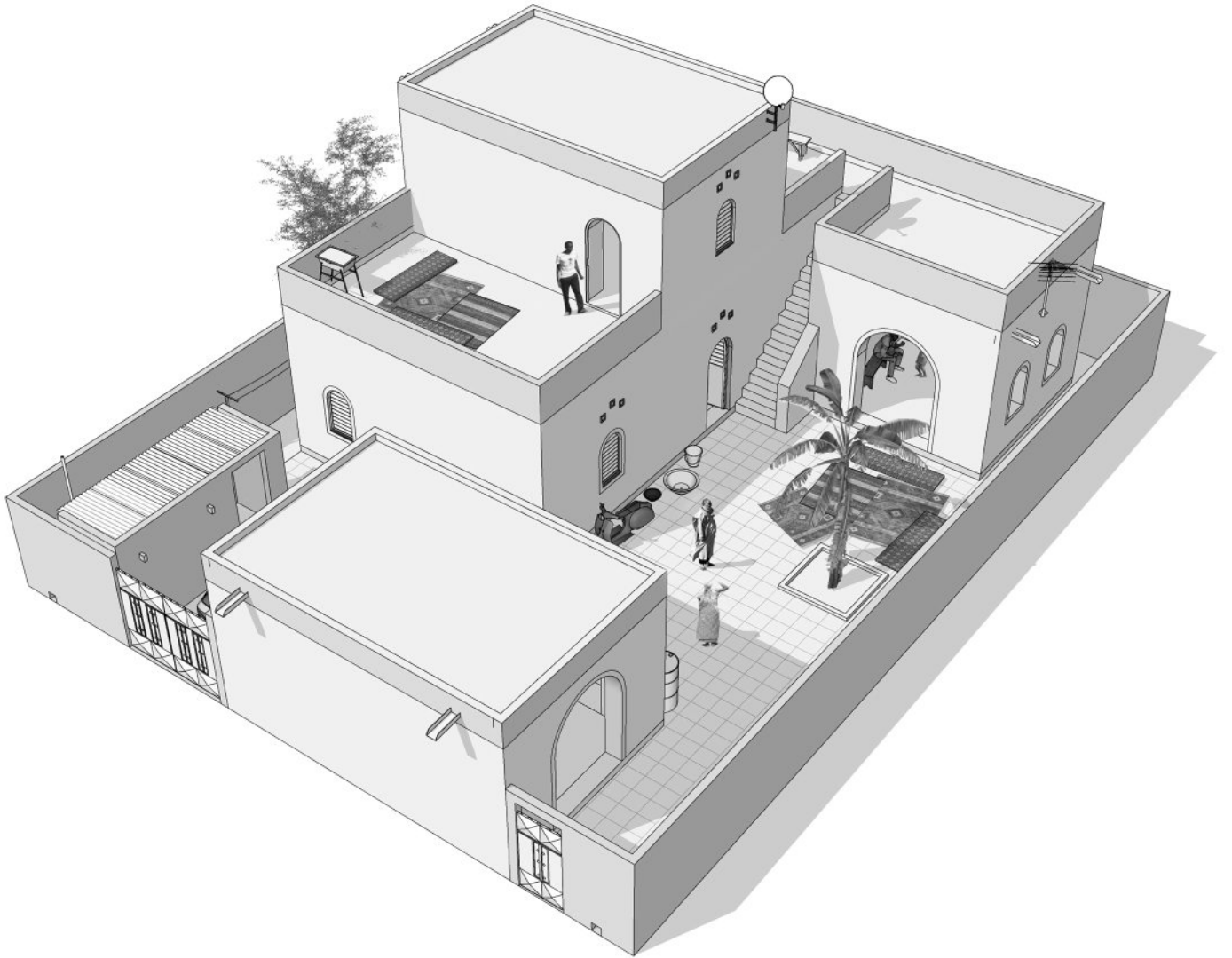
### PHASE 5 : TRIPLE MODULE + HALF MODULE + STAIRCASE + SINGLE MODULE / 92 m<sup>2</sup>



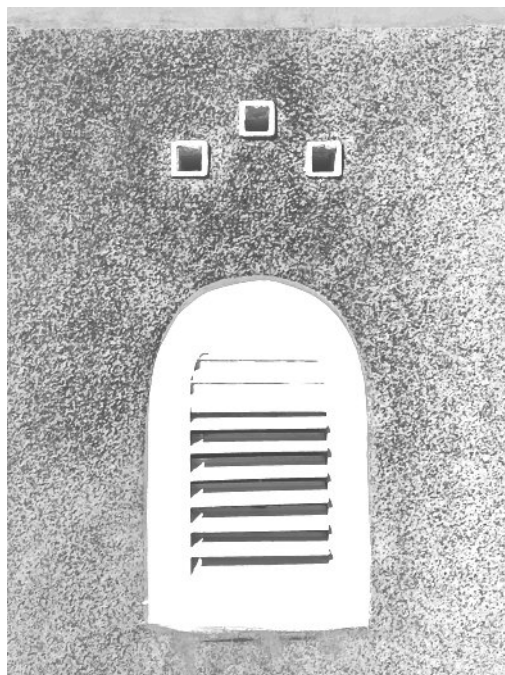
## 4.7

PROGRESSIVE EXTENSIONS FOR A PLOT OF 15 x 20 m

### **PHASE 6 : TRIPLE MODULE + HALF MODULE + STAIRCASE + SINGLE MODULE + 1st FLOOR SINGLE MODULE + BALUSTRADE / 112 m<sup>2</sup>**



# NEIGHBOURHOOD INTERVENTIONS



## HOUSING ESTATES, ECO-VILLAGES...

The NV model of affordable, durable and climate-adapted housing was originally developed in response to the needs of rural families in the Sahel to obtain decent, extendable, housing using locally sourced materials and labour (including unskilled labour from family members).

However, it is also possible to use the same model as a basis for projects such as housing estates and eco-villages. Such projects would require complementary operations covering issues such as street access, public space, plot sizes, sanitation, land rights, planning permissions etc.

Such projects would also require the inclusion of innovatory financial and operational tools and systems to ensure that the concerned families are actually able to access, afford and maintain their homes.







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