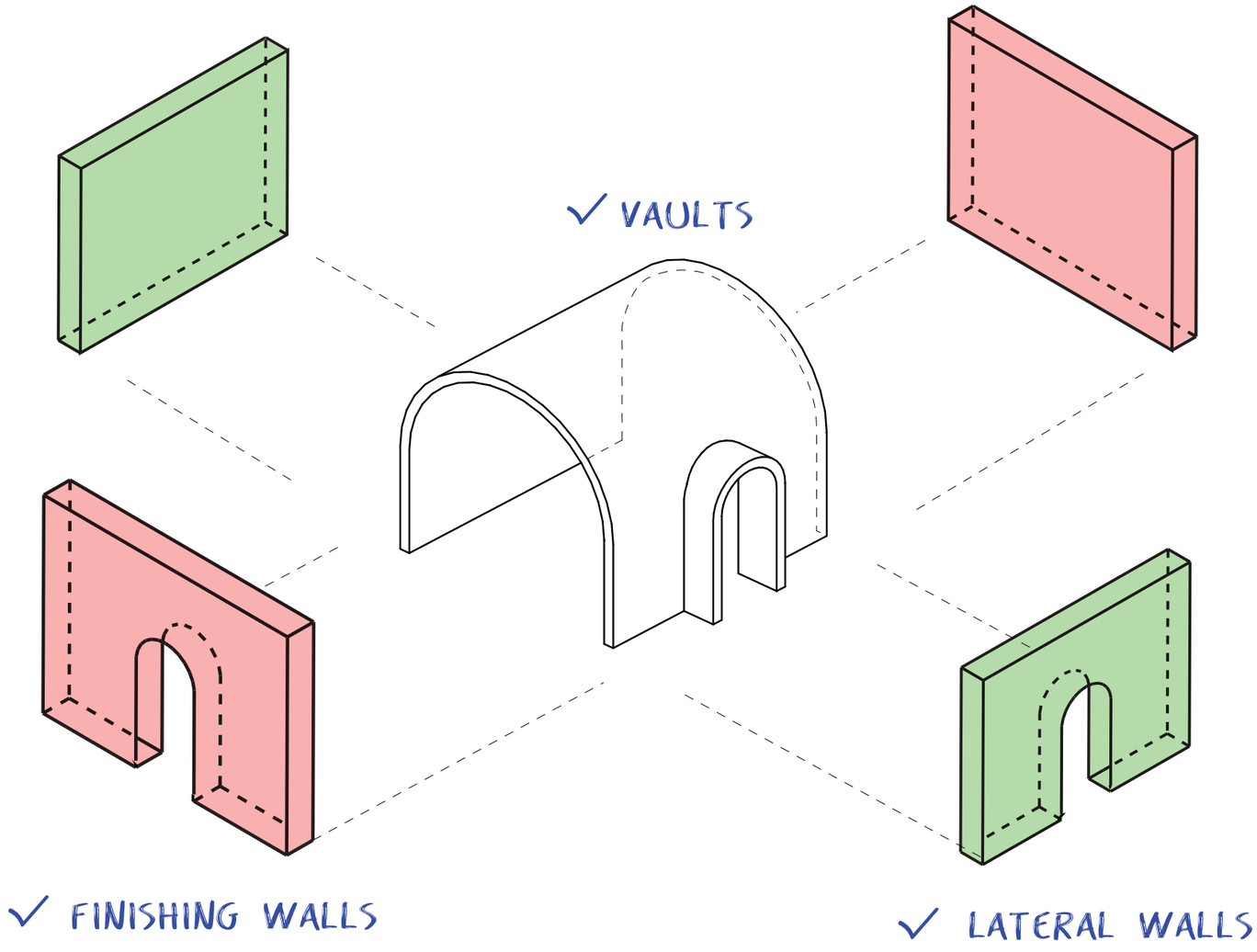
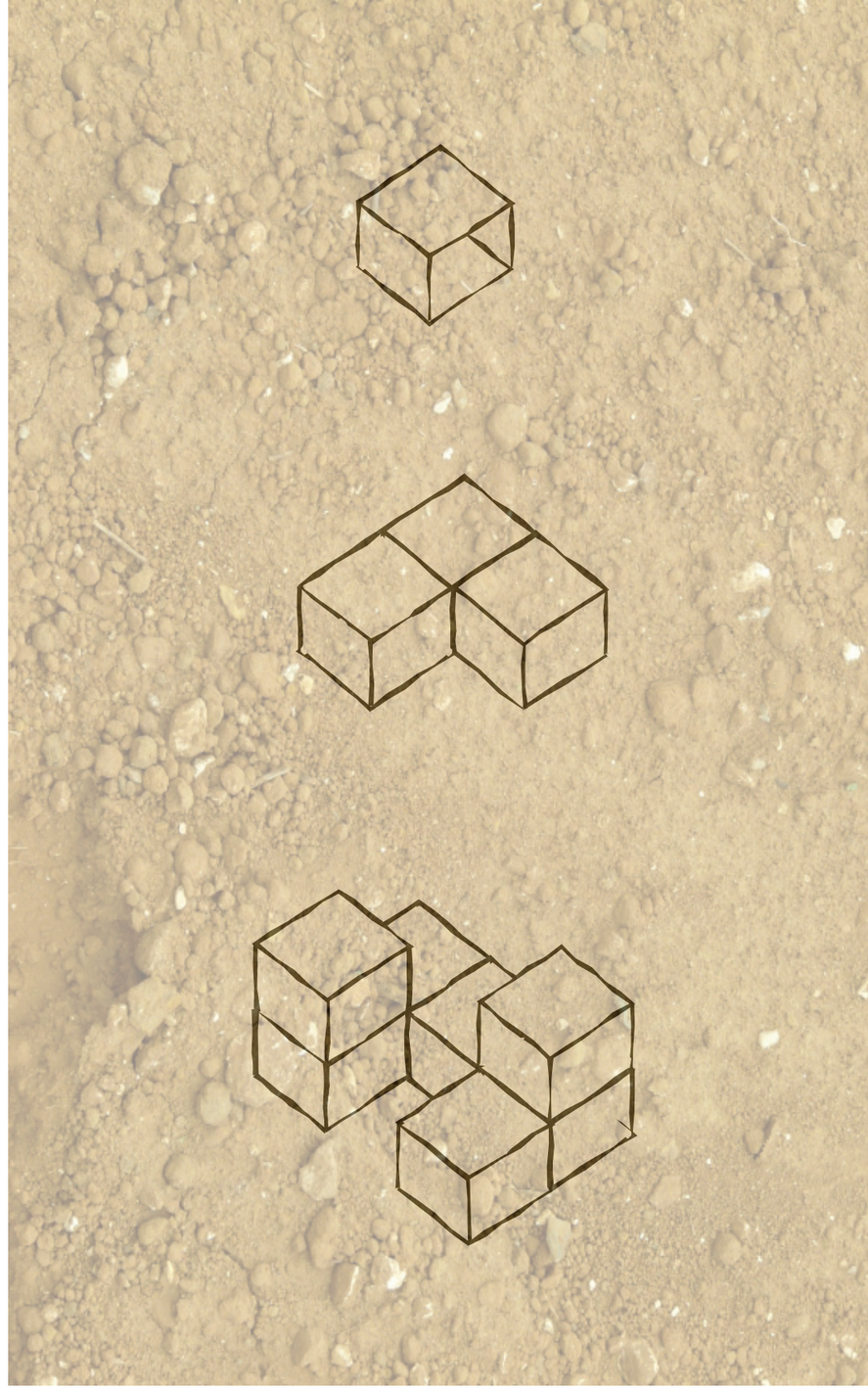
MODULAR SELF-HELP HOUSING

EARTH ARCHITECTURE





JUNG Misoo

- National Architecture Superieur School of Paris-Malaquais
- Member of Korean Architectes Association in France

EARTH ARCHITECTURE



AFFORDABLE

100% NATURAL LOCAL RESOURCE

MOISTURE CONTROL

LOW CARBON FOOTPRINT

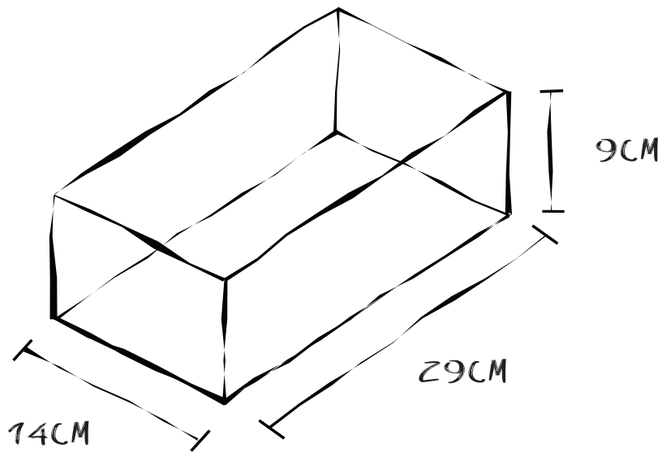
CLIMATIC CONTROL

BEAUTY OF COLOURS & TEXTURES

FIRE RESISTANCE

TECHINIC Compressed Stabilised Earth Block(CSEB)

Auroville Earth Institut, Unesco Chair Earthen Architecture



The soil, raw or stabilized, for a compressed earth block is slightly moistened, poured into a steel press and then compressed either with a manual or motorized press. Compressed earth blocks can be stabilised or not.

Most of the times, they are stabilised with cement or lime. Therefore, we prefer today to call them Compressed Stabilised Earth Blocks. The input of soil stabilization allowed people to build higher with thinner walls, which have a much better compressive strength and water resistance.



ADVANTAGES OF CSEB

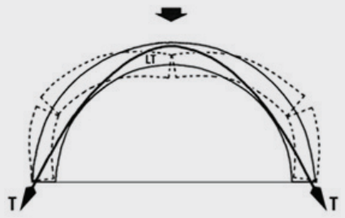
- ✓ LOCAL MATERIAL
- ✓ GREAT DURABILITY
- ✓ COST EFFICIENCY
- ✓ SIMPLE TECHNOLOGY
- ✓ LOW ENERGY CONSUMING
- ✓ LOW POLLUTION EMISSION

	Soil for cement stabilisation:	Gravel = 15%	Sand = 50%	Silt = 15%	Clay = 20%
✓ CHOICE	Soil for lime stabilisation:	Gravel = 15%	Sand = 30%	Silt = 20%	Clay = 35%

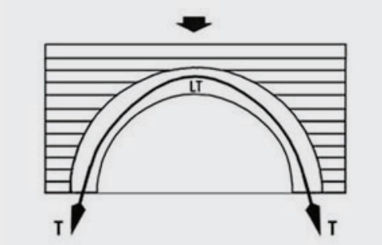
		Minimum	Average	Maximum
	Cement stabilisation	3 %	5 %	No technical maximum
✓ CHOICE	Lime stabilisation	2 %	6 %	10%

STRUCTURE ARCHES AND VAULTS

Auroville Earth Institut, Unesco Chair Earthen Architecture

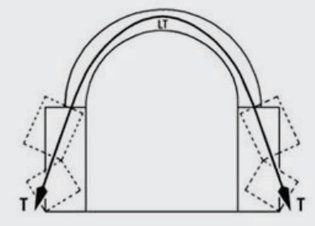


Central load and failure

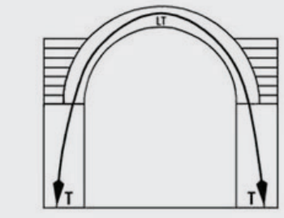


Loaded arch

Keep the shape and load the haunches.



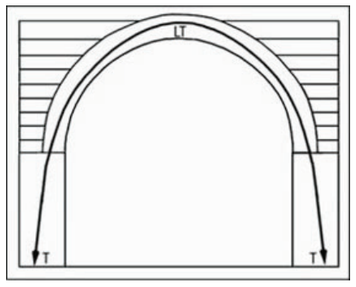
Pier too thin and failure



Load on the haunches

Load the haunches of the arch to change the angle of the thrust.

THE ARCH THICKNESS ON STABILITY

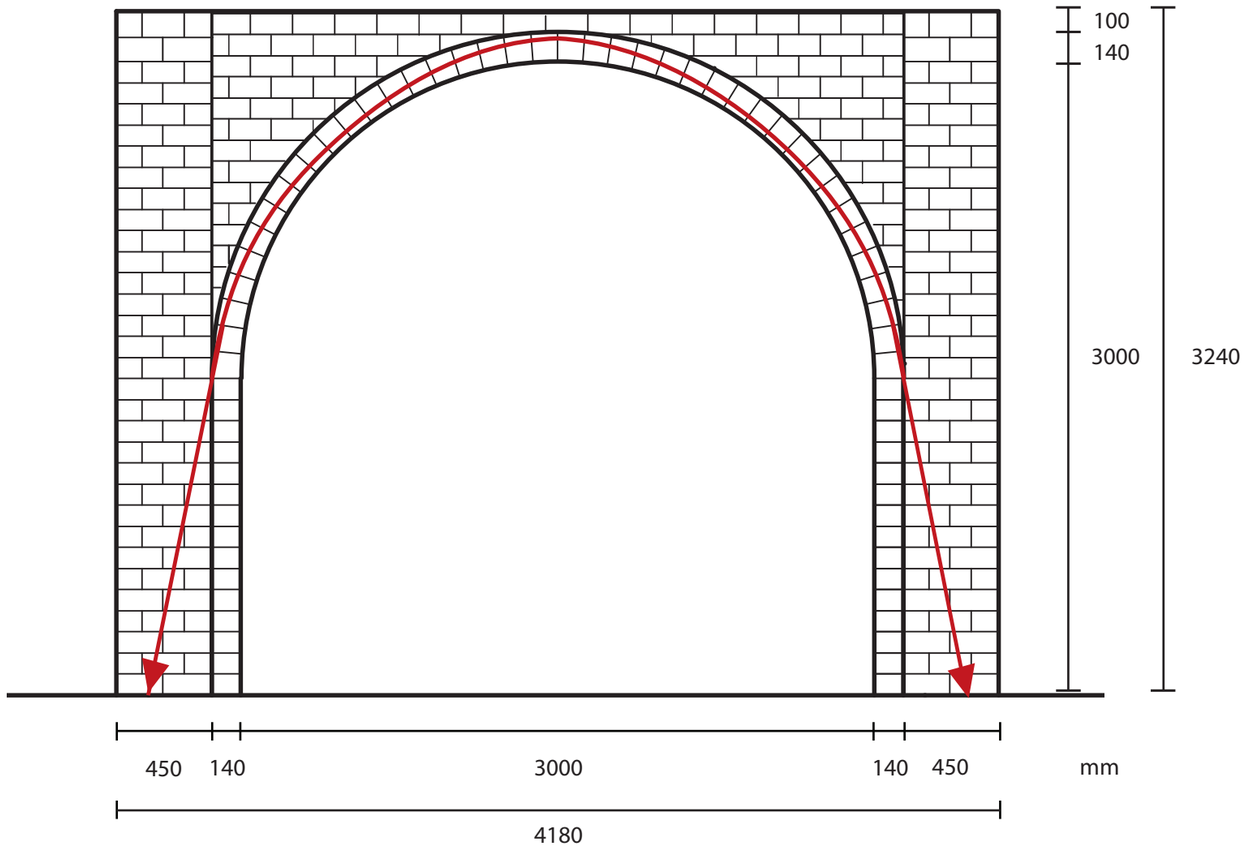


The load on the haunches will load the pier and bring the thrust more vertical. Thus, the width of the pier can be reduced also.

Thickness with load on the haunches:
T = S/10
(Where t is the thickness and S the span)

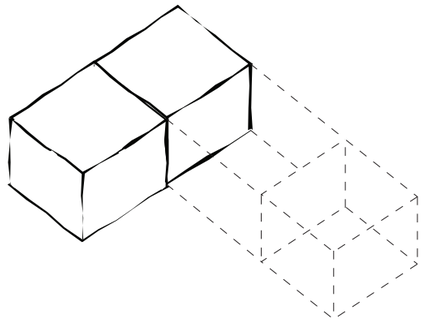
PROPOSED ARCH WITH CSEB

- ✓ 100% EARTH MATERIAL
- ✓ SIMPLE SKILLS
- ✓ STABLE STRUCTURE

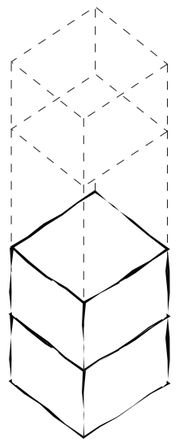


MODULAR SYSTEM

PRINCIPLE



HORIZONTAL EXTENSION

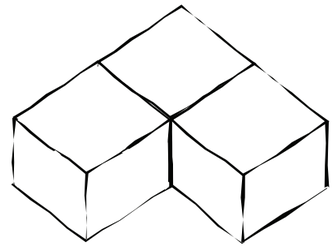


VERTICAL EXTENSION

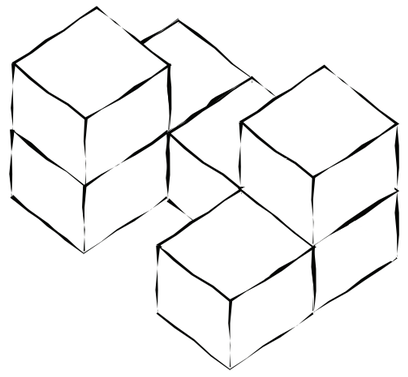
MODULAR SYSTEM

- ✓ EASY ASSEMBLY UNITS
- ✓ FLEXIBLE EXTENSION
- ✓ BUILDING DENSITY
- ✓ SUITABLE FOR ALL AREAS
  URBAN/ SUBURBAN/ RURAL

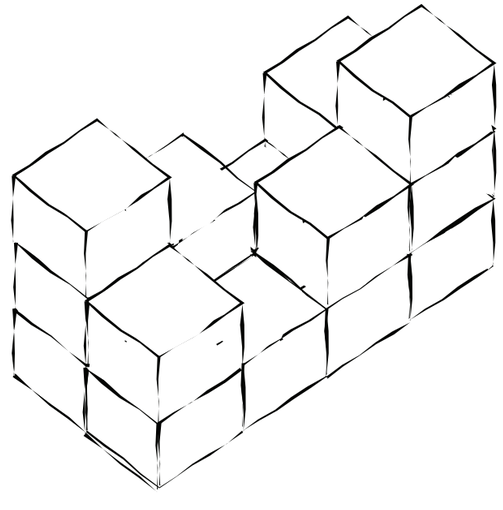
RURAL



SUBURBAN

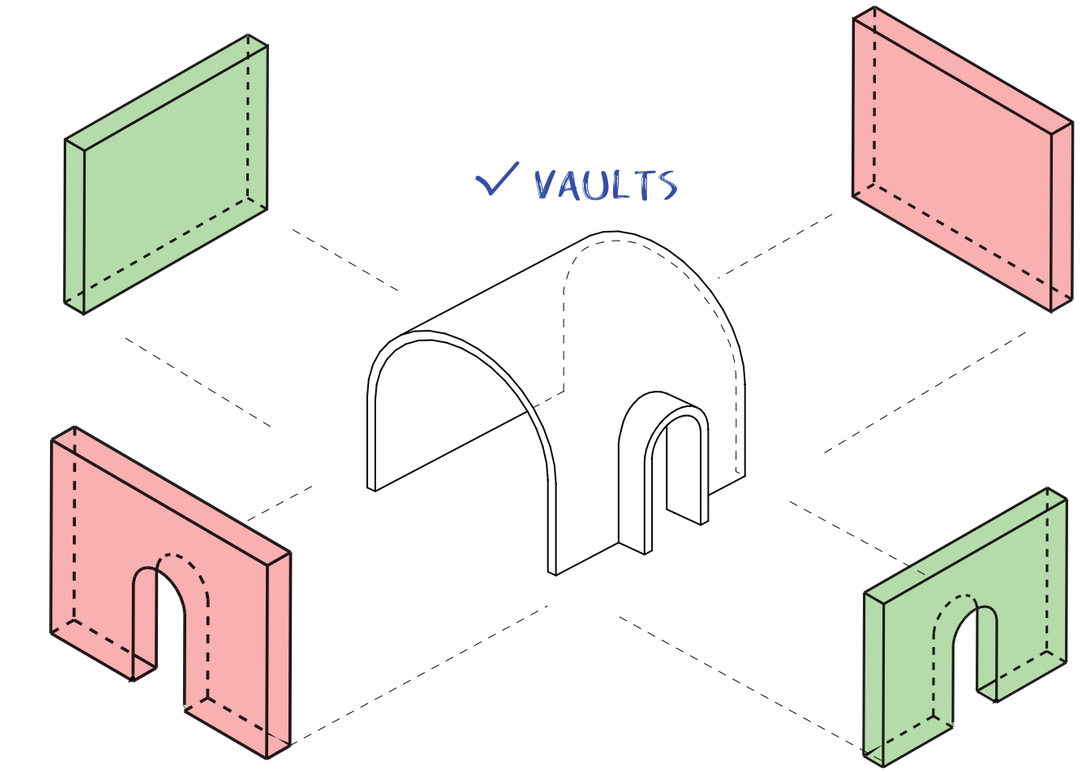


URBAN



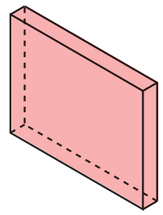
MODULAR SYSTEM

MODULES



✓ FINISHING WALLS

1.



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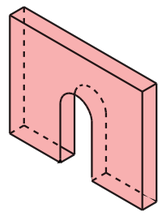
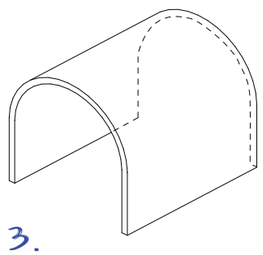


✓ VAULTS



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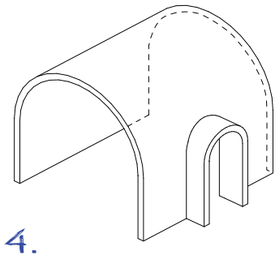

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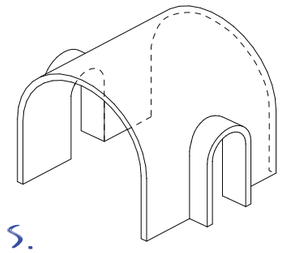
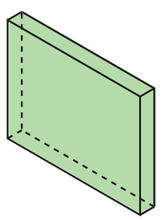


5.

✓ LATERAL WALLS

6.



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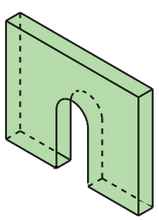
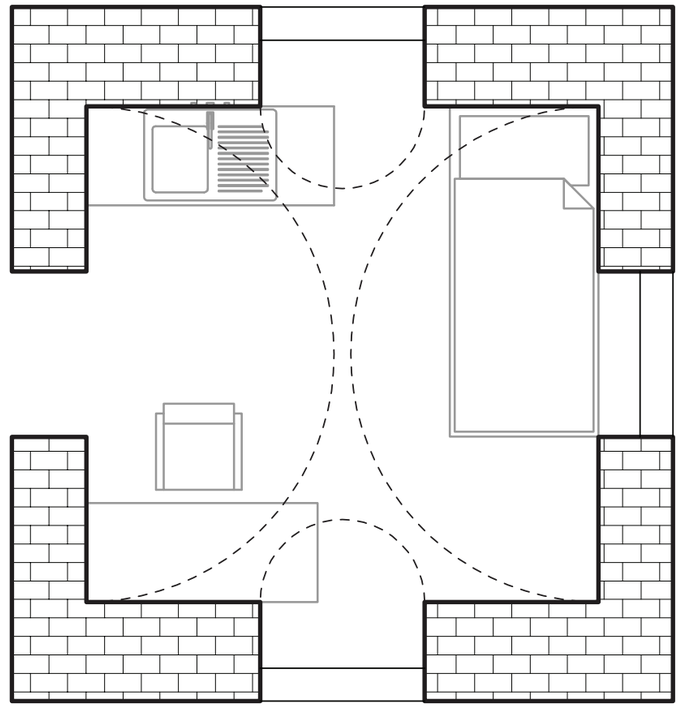


EXAMPLE RURAL



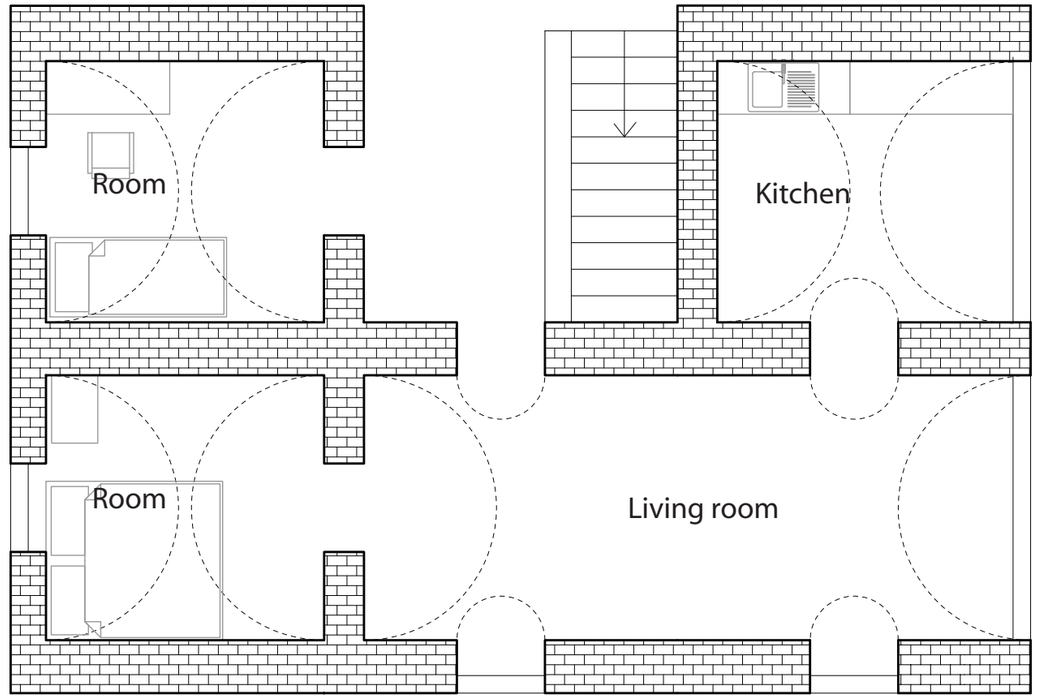


PLAN

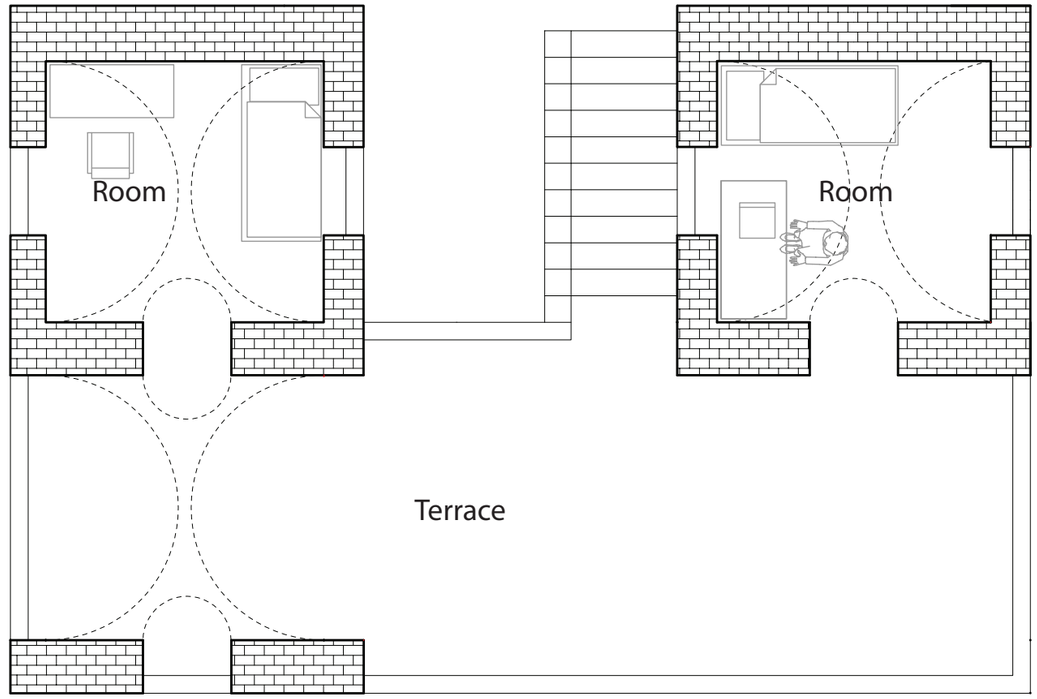
1 2 3m

EXAMPLE SUBURBAN





FIRST FLOOR PLAN

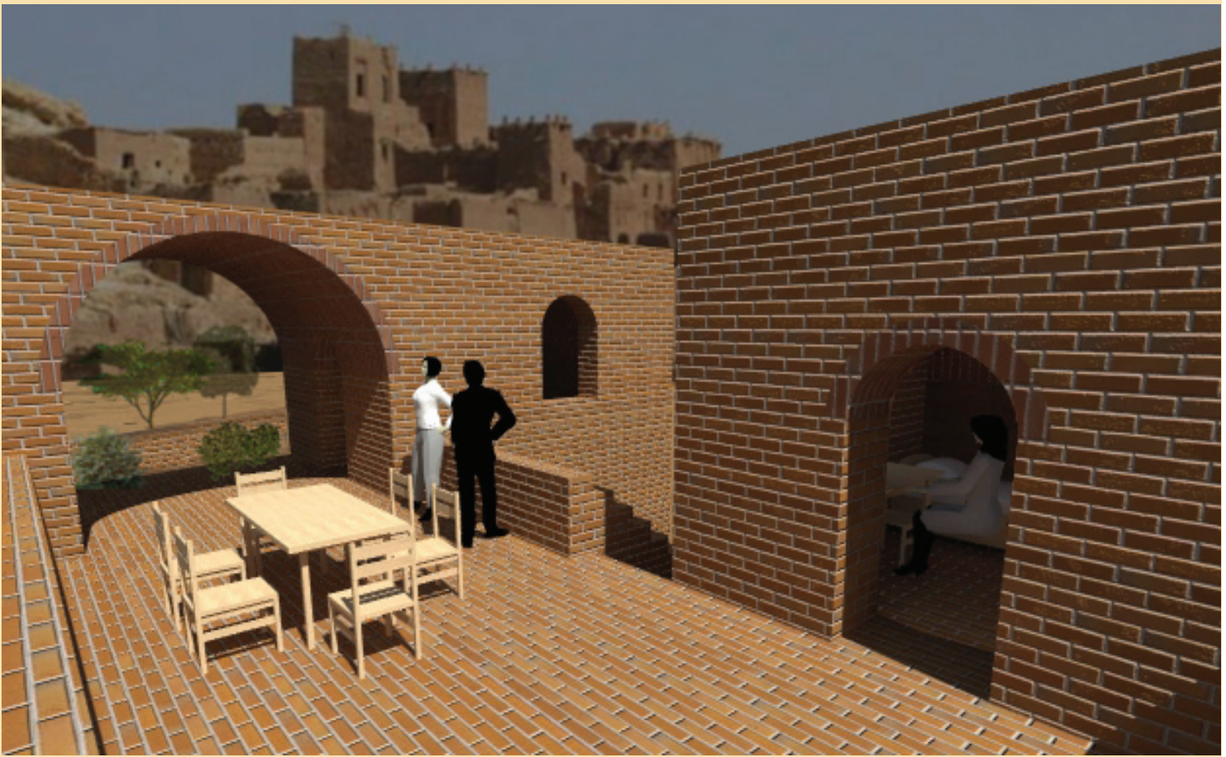


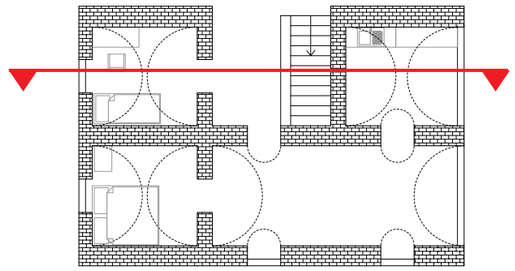
SECOND FLOOR PLAN

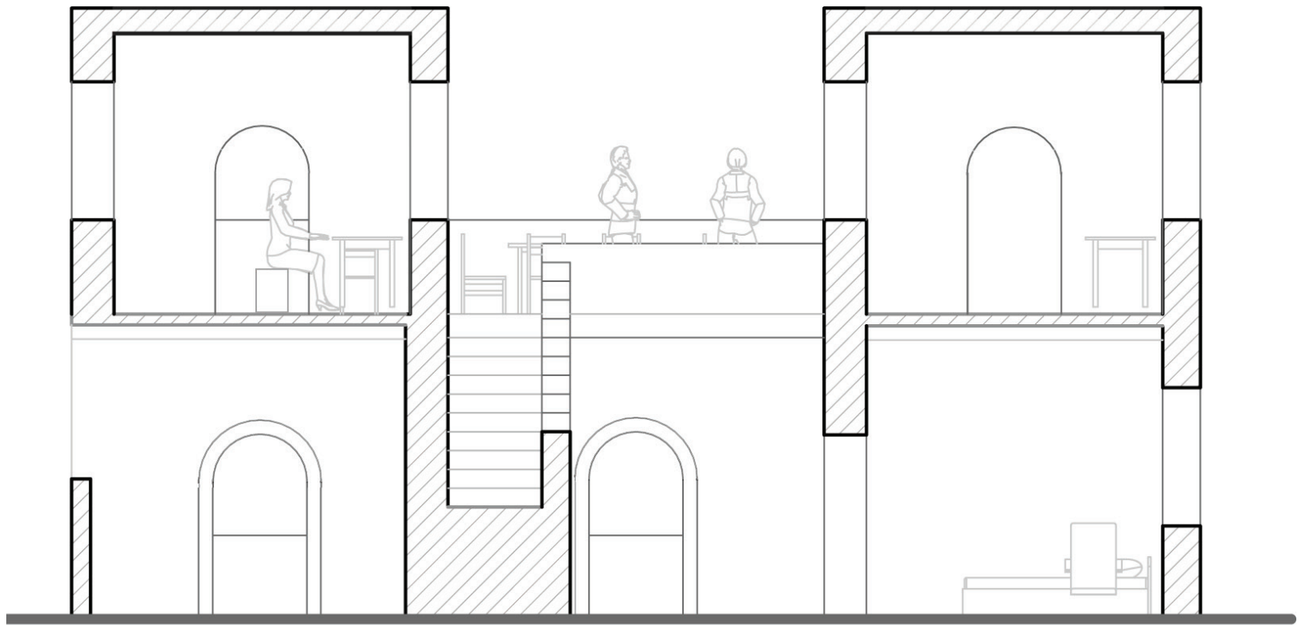
1 2 3m

EXAMPLE SUBURBAN









SECTION

1 2 3m