

A VILLA IN SHAQRA CITY, SAUDI ARABIA

Mohammad Alfadil

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements
for the degree of

Master of Architecture in Architecture

Howard S. Gartner

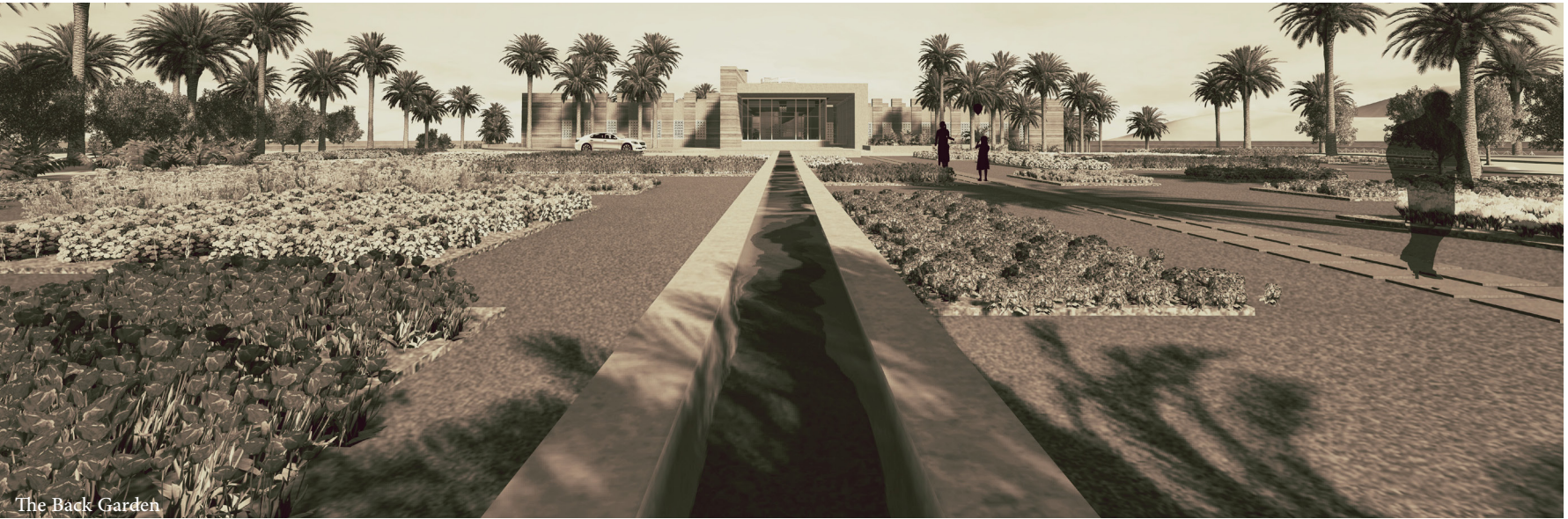
Steven R. Thompson

James R. Jones

May 8, 2013
Blacksburg, VA

Keywords: Villa, Rammed earth, Mashrabiya, connection, irrigation, farm

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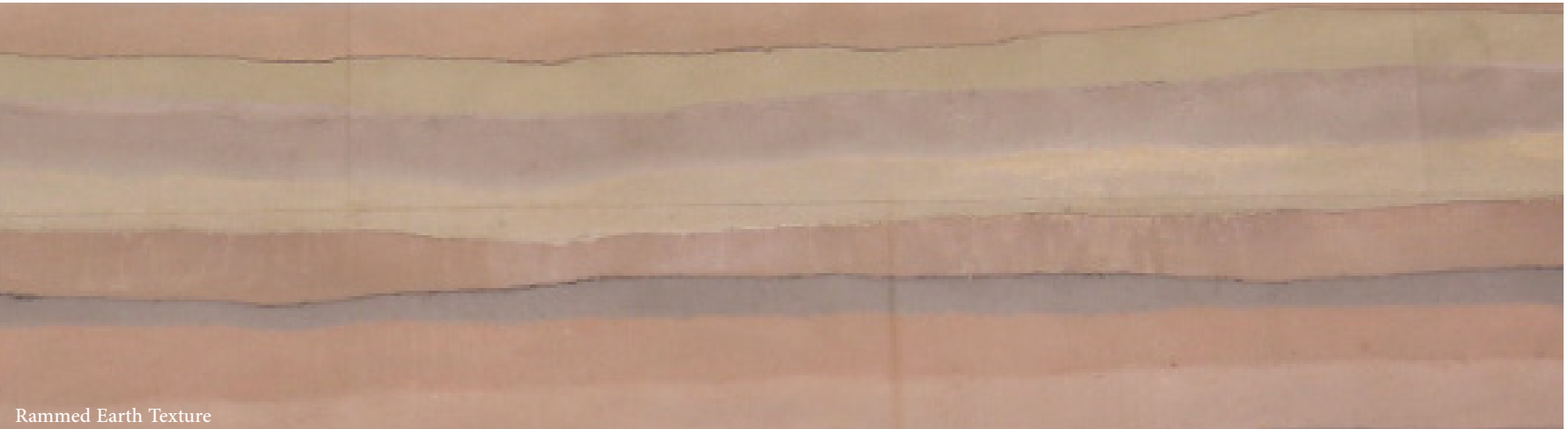


The Back Garden

ABSTRACT

This thesis project proposes the establishment of a family villa in Shaqra, Saudi Arabia. The villa is set in an irrigated landscape that provides local cooling and green fields. The water is drawn from deep wells and stored on site. The walls of the villa are constructed from local sands and readily available modern materials affirming the qualities and character of the desert landscape surrounding the villa.

A Villa in Shaqra City, Saudi Arabia
Mohammad Alfadil



Rammed Earth Texture

ACKNOWLEDGEMENTS

Without the presence, love, and support of my family, friends, and my professors, this thesis could not have been made possible.

To my family, thanks for every thing.

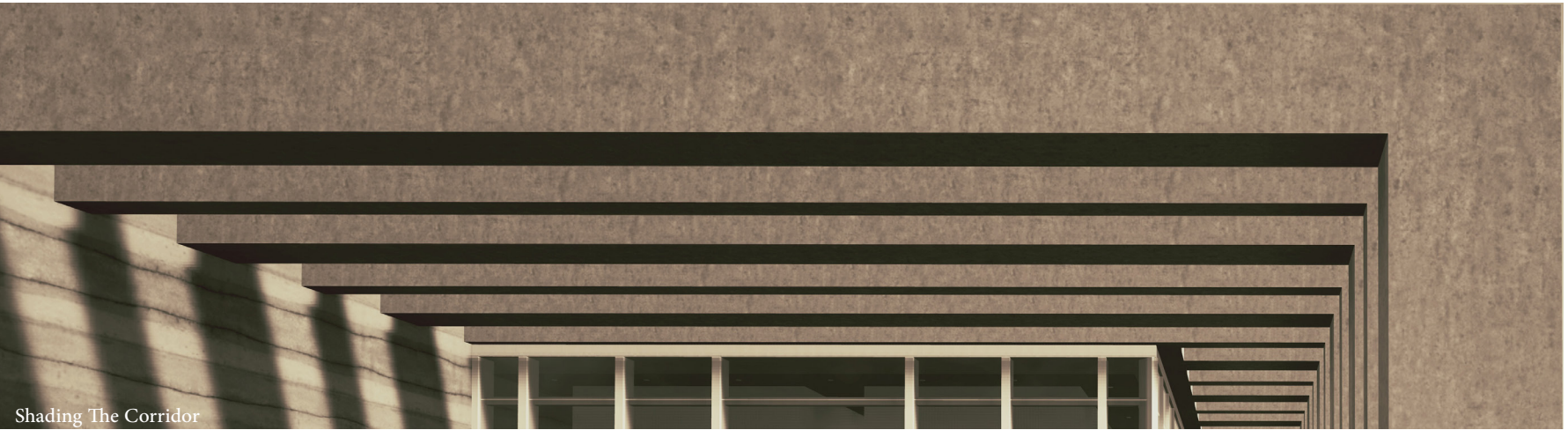
To my committee: Steven Thompson, Howard Gartner, and James Jones, thanks all for your patience and critique of my work. Thanks for your interest, support my architectural education and making this past year an enjoyable journey of exploration and discoveries.



View From The North of The Villa

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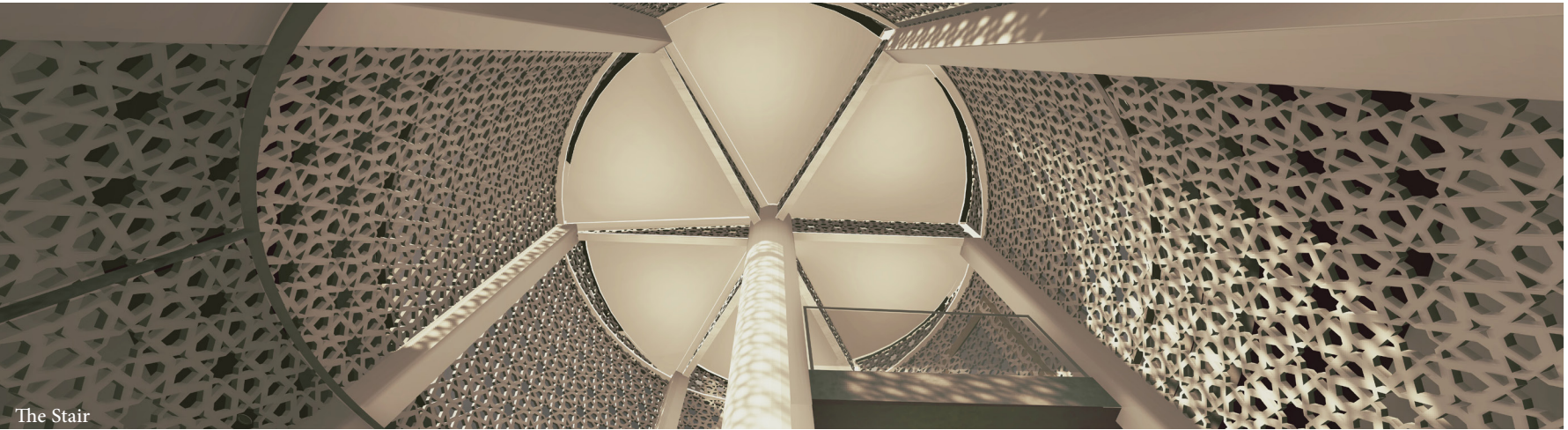
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Shading The Corridor

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The Stair

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THE SITE

The Site

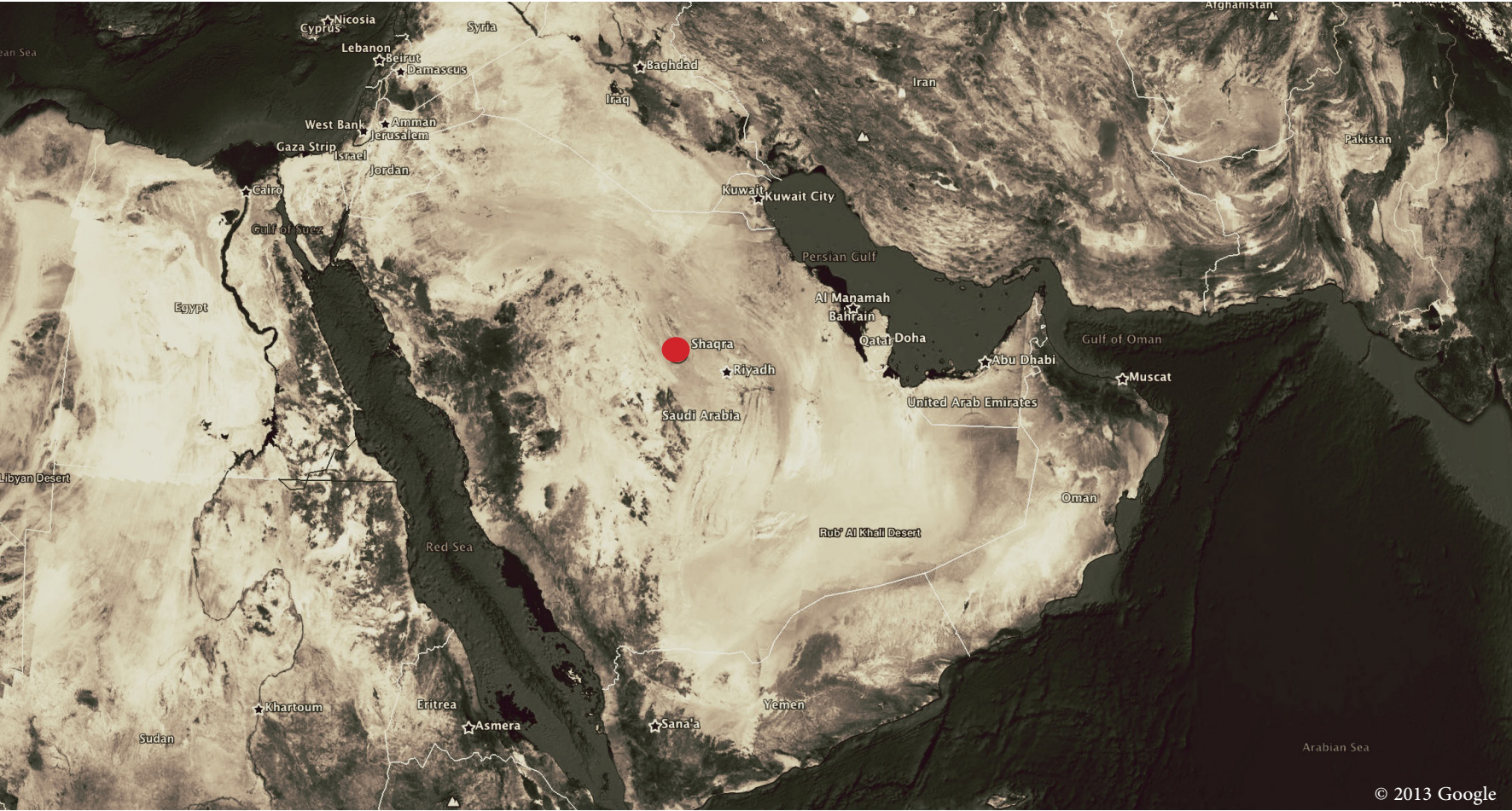


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Saudi Arabia shown in the world map.

THE SITE

The Site



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Shaqra city shown in Saudi Arabia map.

THE SITE

The Site



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The site shown close to Shaqra city.

THE SITE

The Site



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The Building Site.

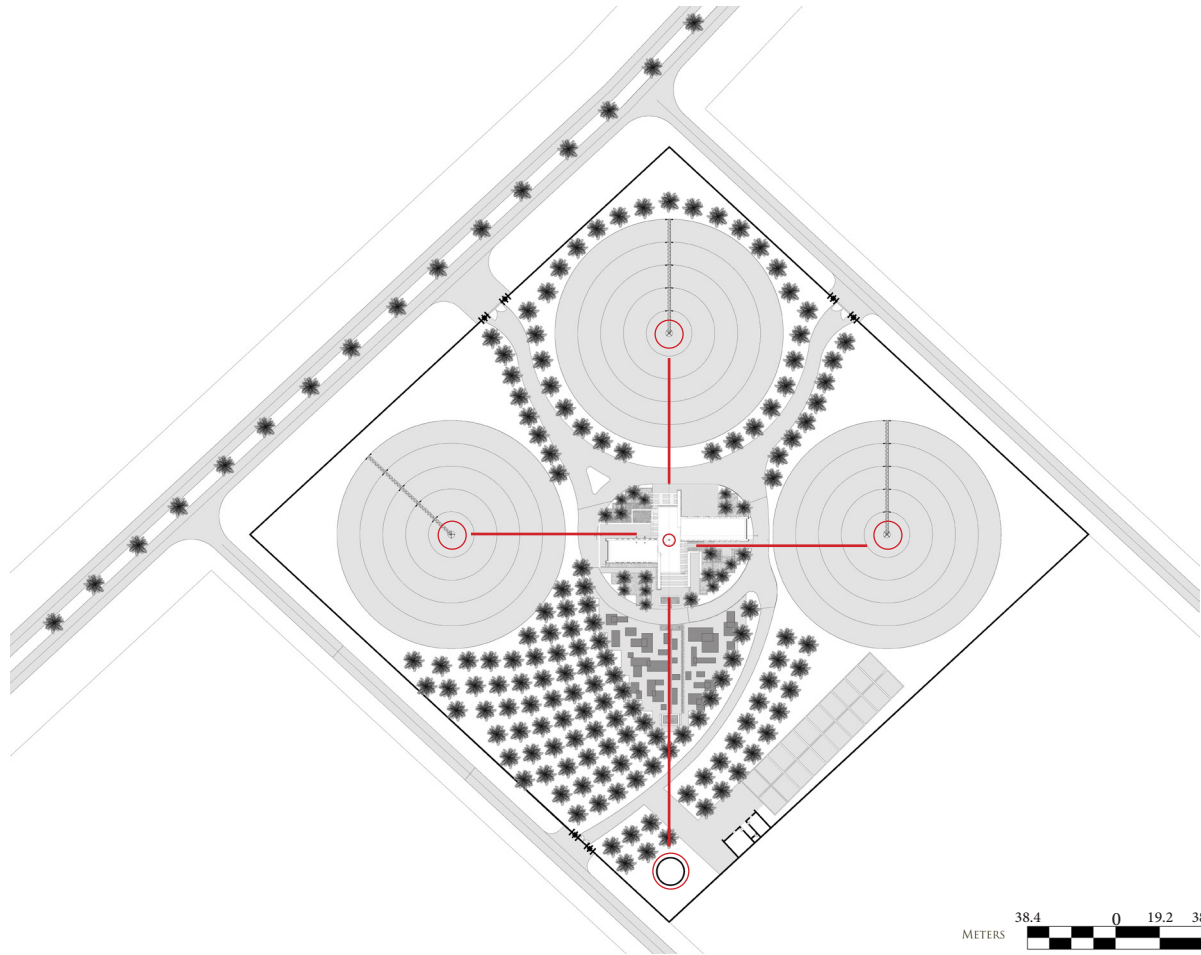
CONCEPT

Concept



CONCEPT

Concept

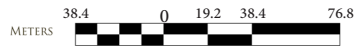
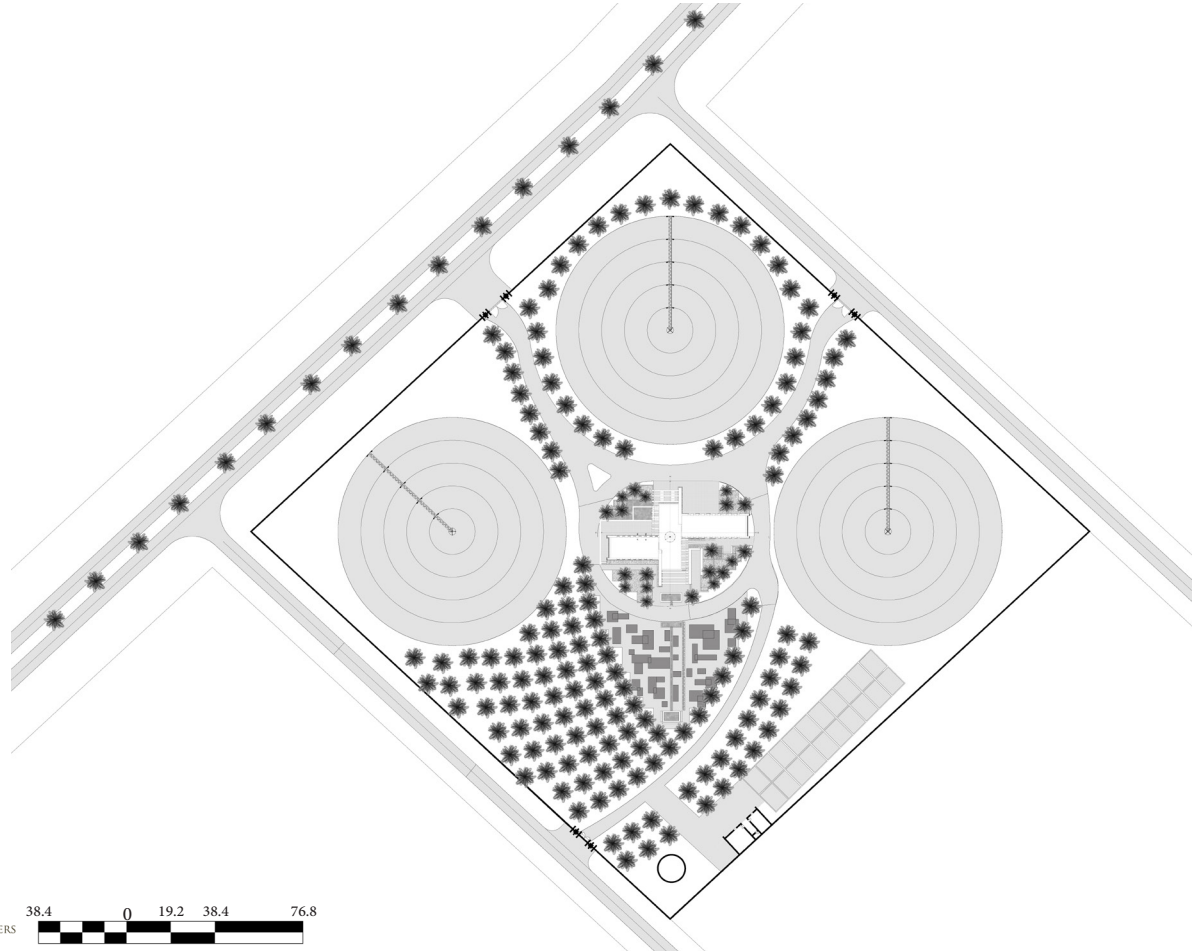


The Building Site.

PLANS

Plans

Final Phase

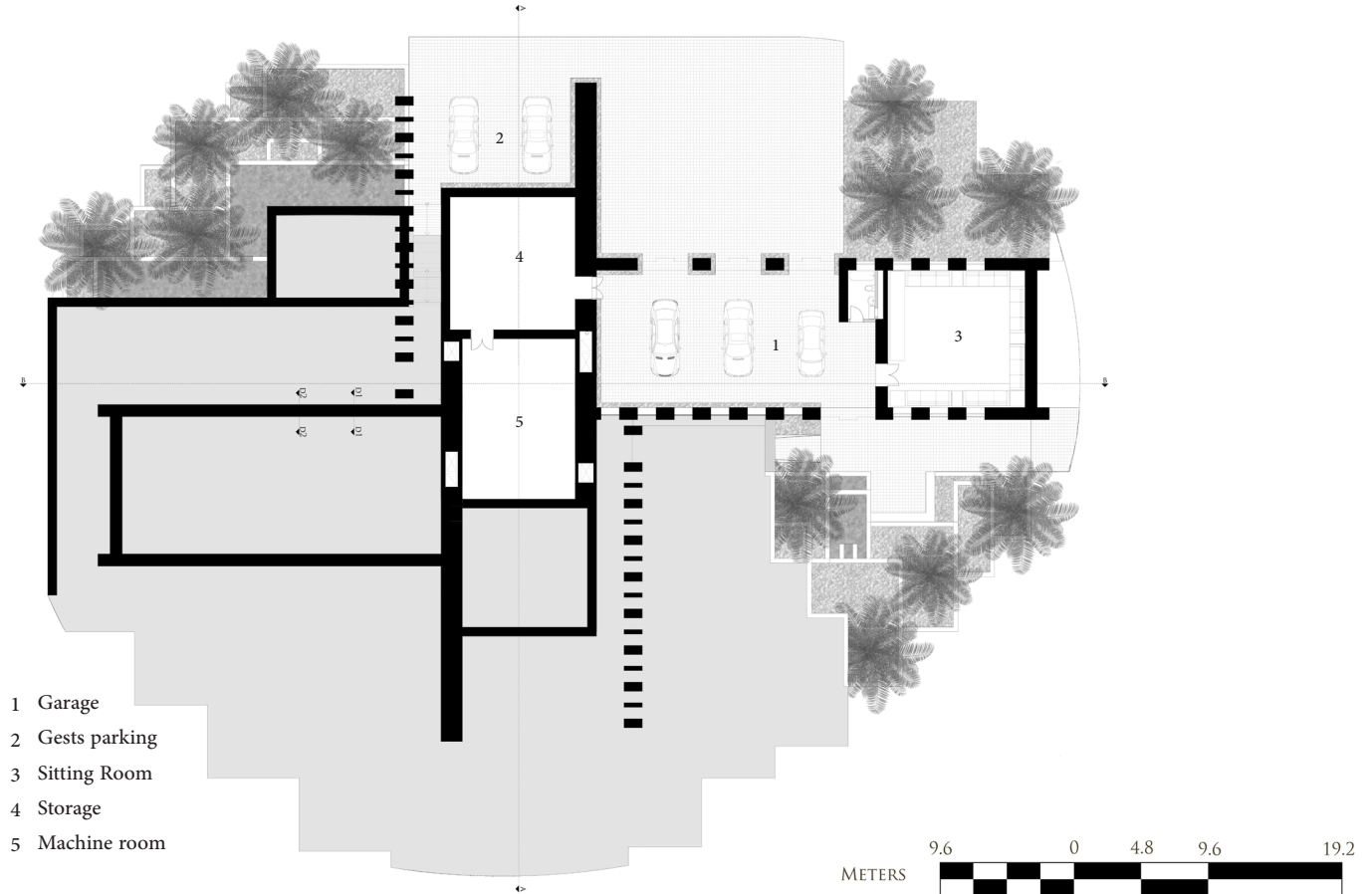


Site Plan.

PLANS

Final Phase

Plans

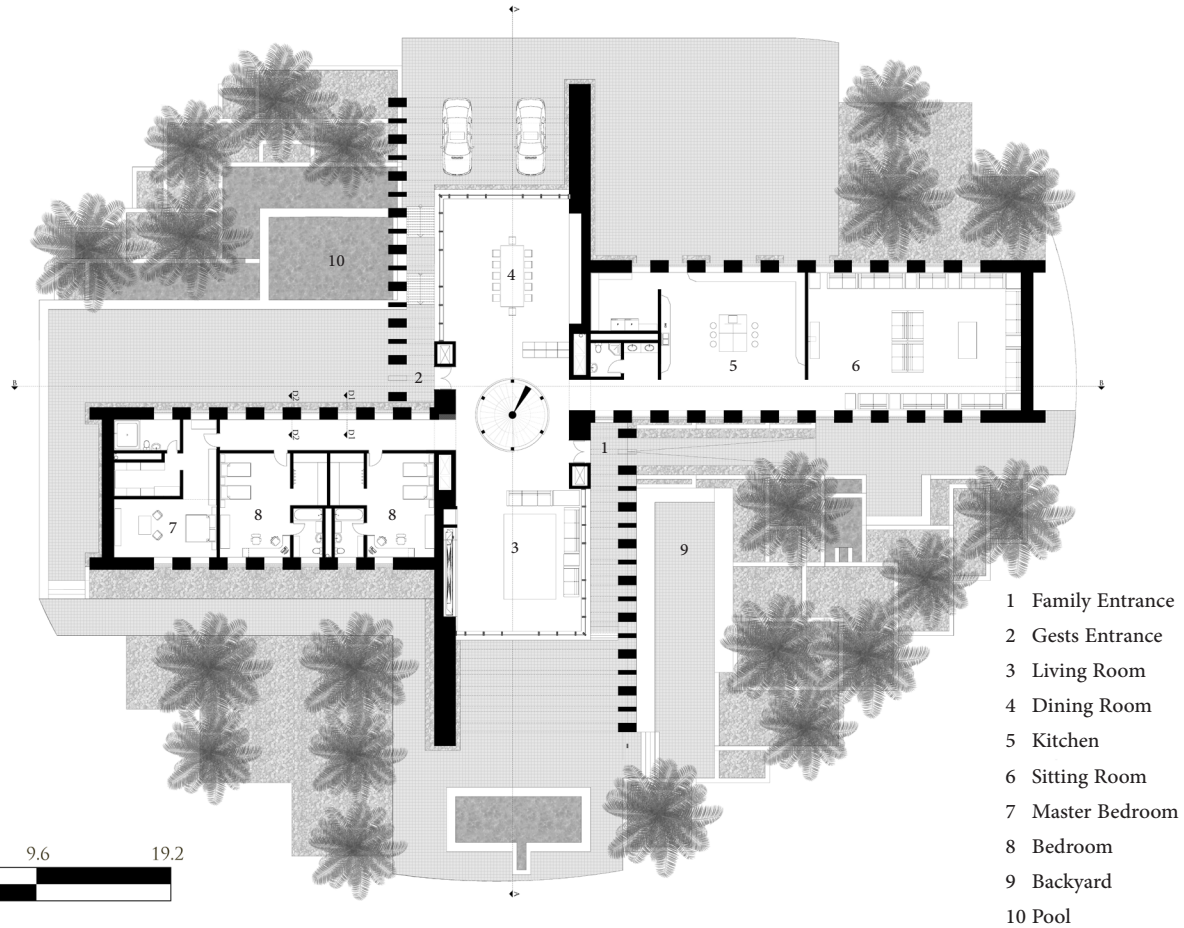


Ground Floor.

PLANS

Plans

Final Phase

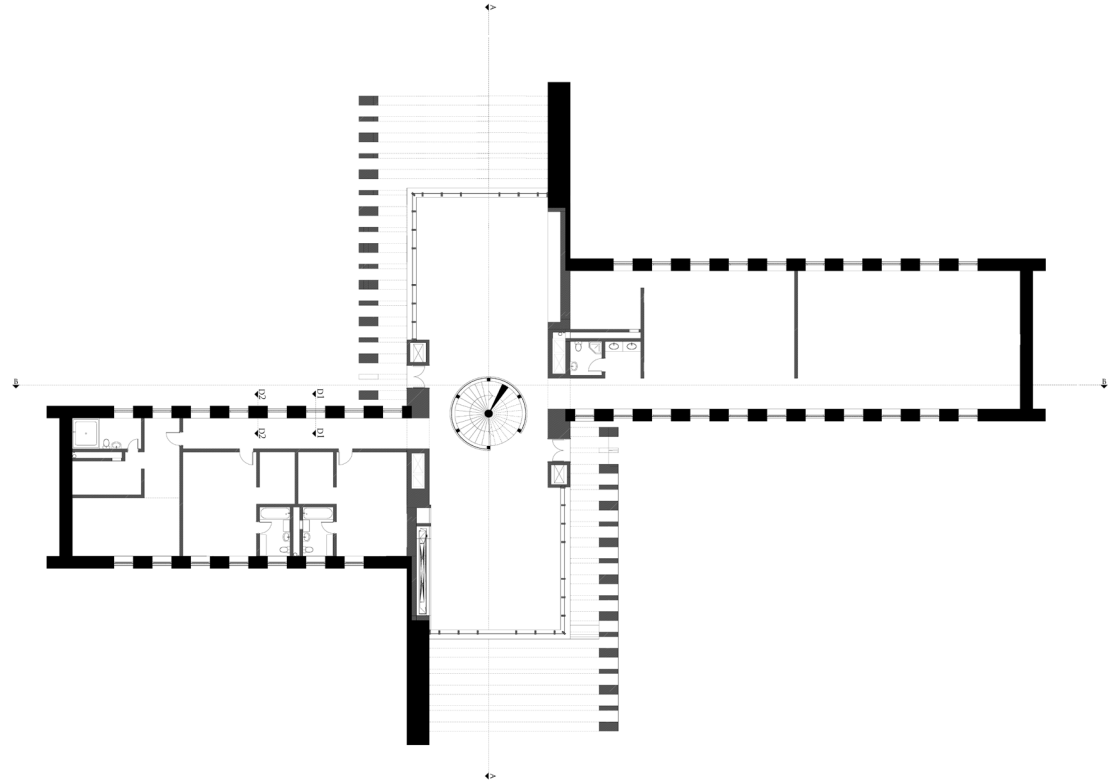


First Floor.

PLANS

Final Phase

Plans



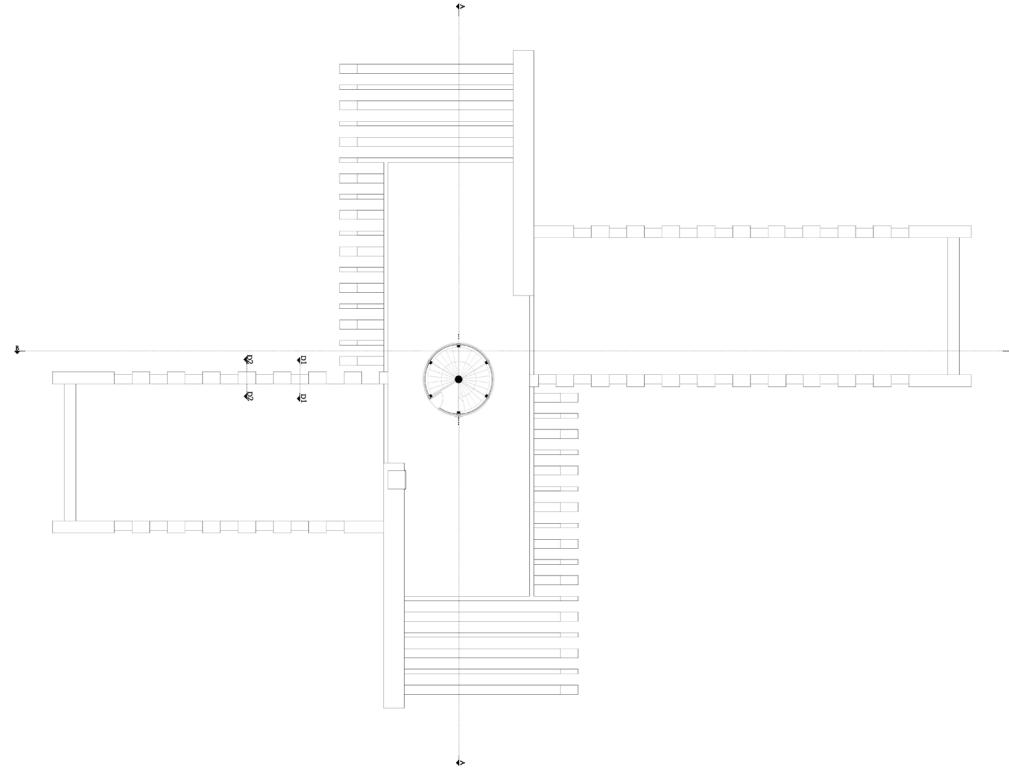
■ Rammed Earth ■ Concrete

Material Plan.

PLANS

Plans

Final Phase

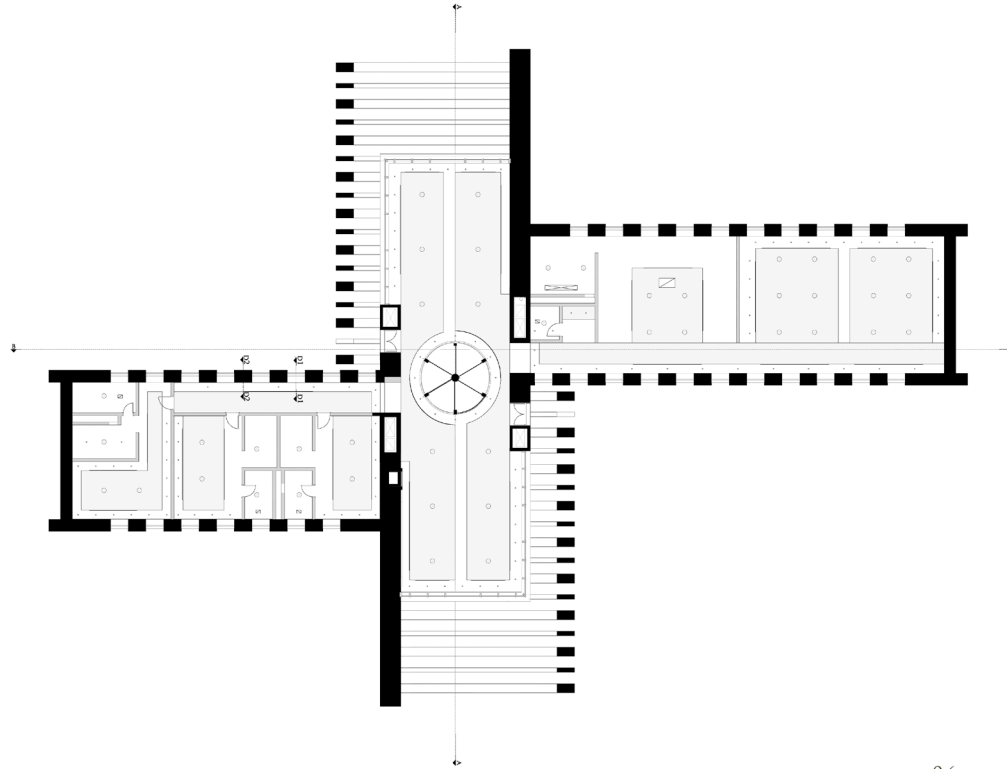


Roof Plan.

PLANS

Final Phase

Plans



Reflected Ceiling Plan.

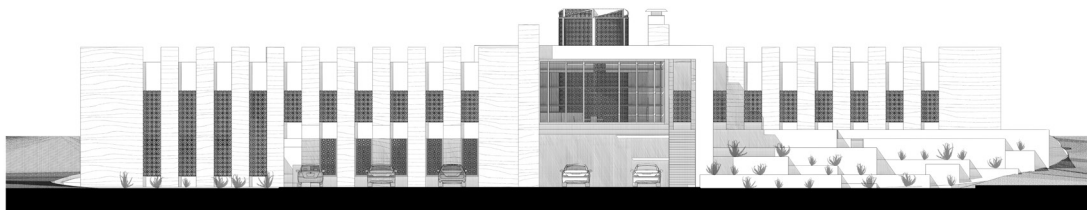
ELEVATIONS

Elevations

Final Phase



EAST ELEVATION



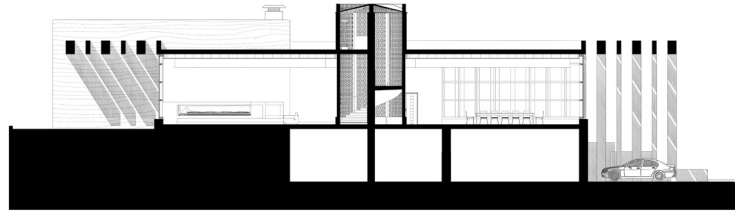
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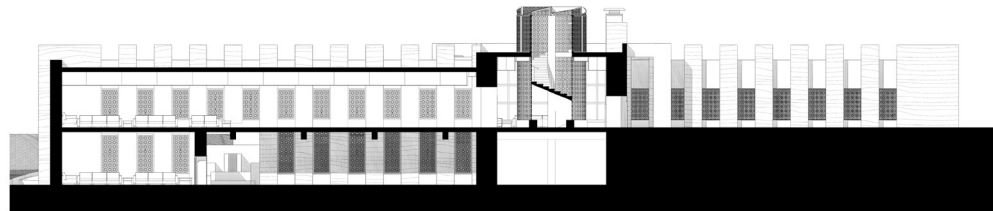
SECTIONS

Final Phase

Sections



SECTION A-A



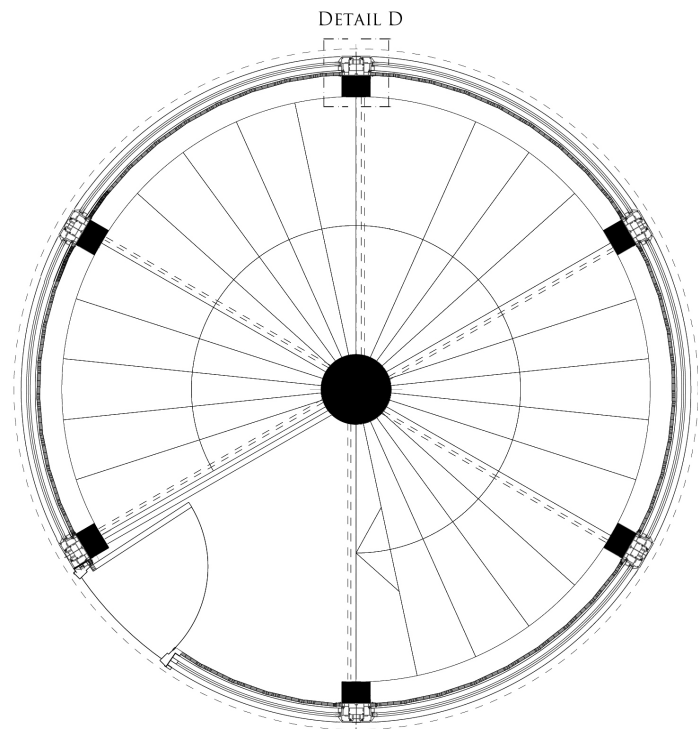
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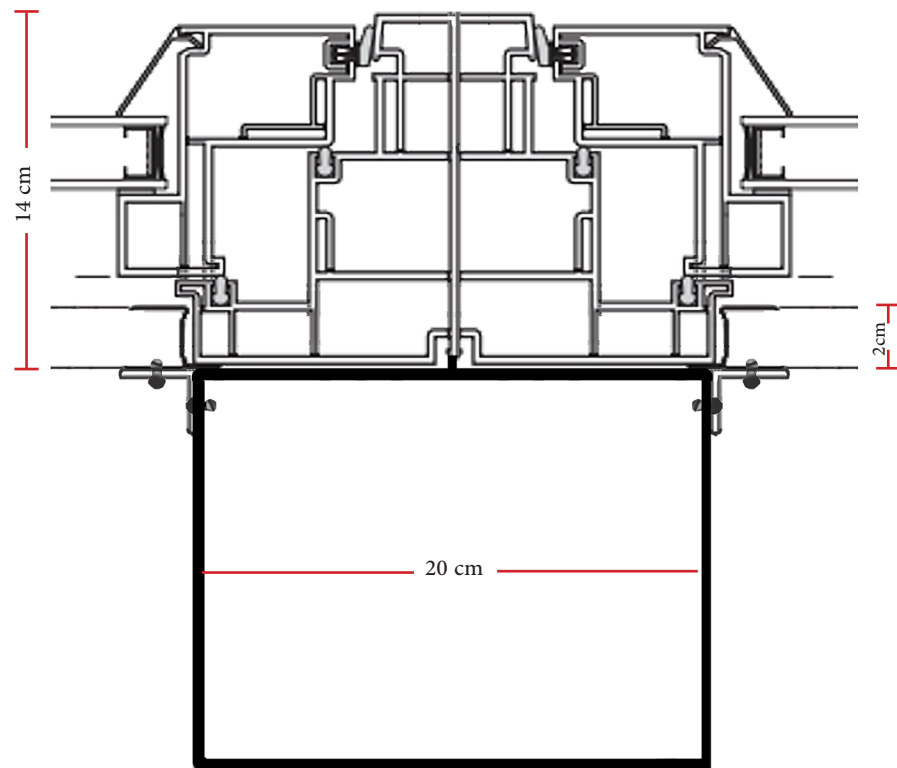
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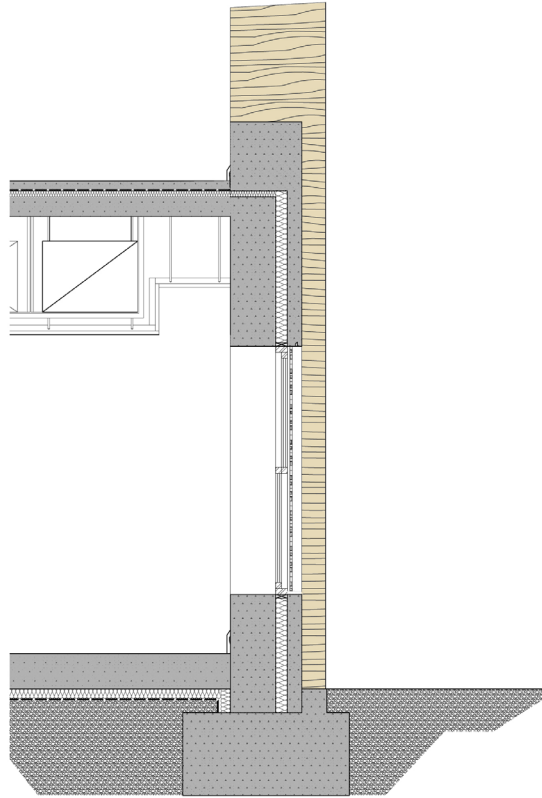
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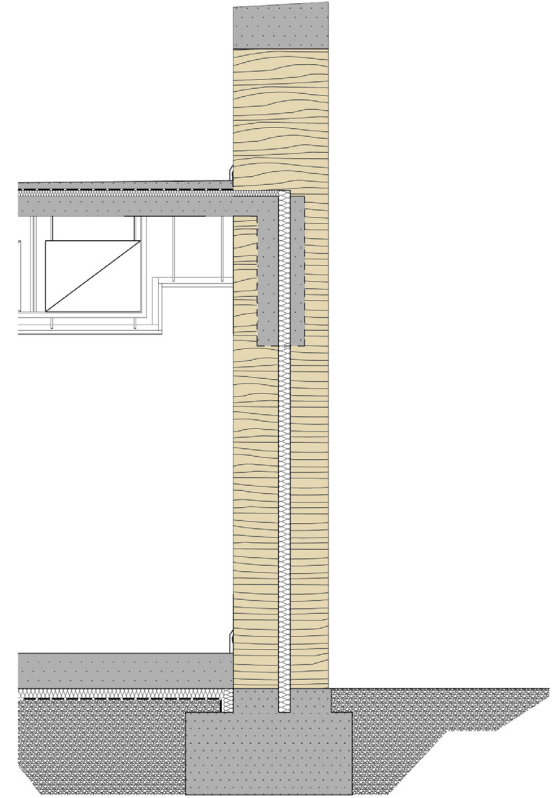
STAIRS DETAIL



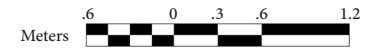
DETAIL D



SECTION D1-D1



SECTION D2-D2



PERSPECTIVES

Perspectives Final Phase



General View.

PERSPECTIVES

Final Phase Perspectives



The Fountain in The South Garden.

PERSPECTIVES

Perspectives Final Phase



Family Entrance.

PERSPECTIVES

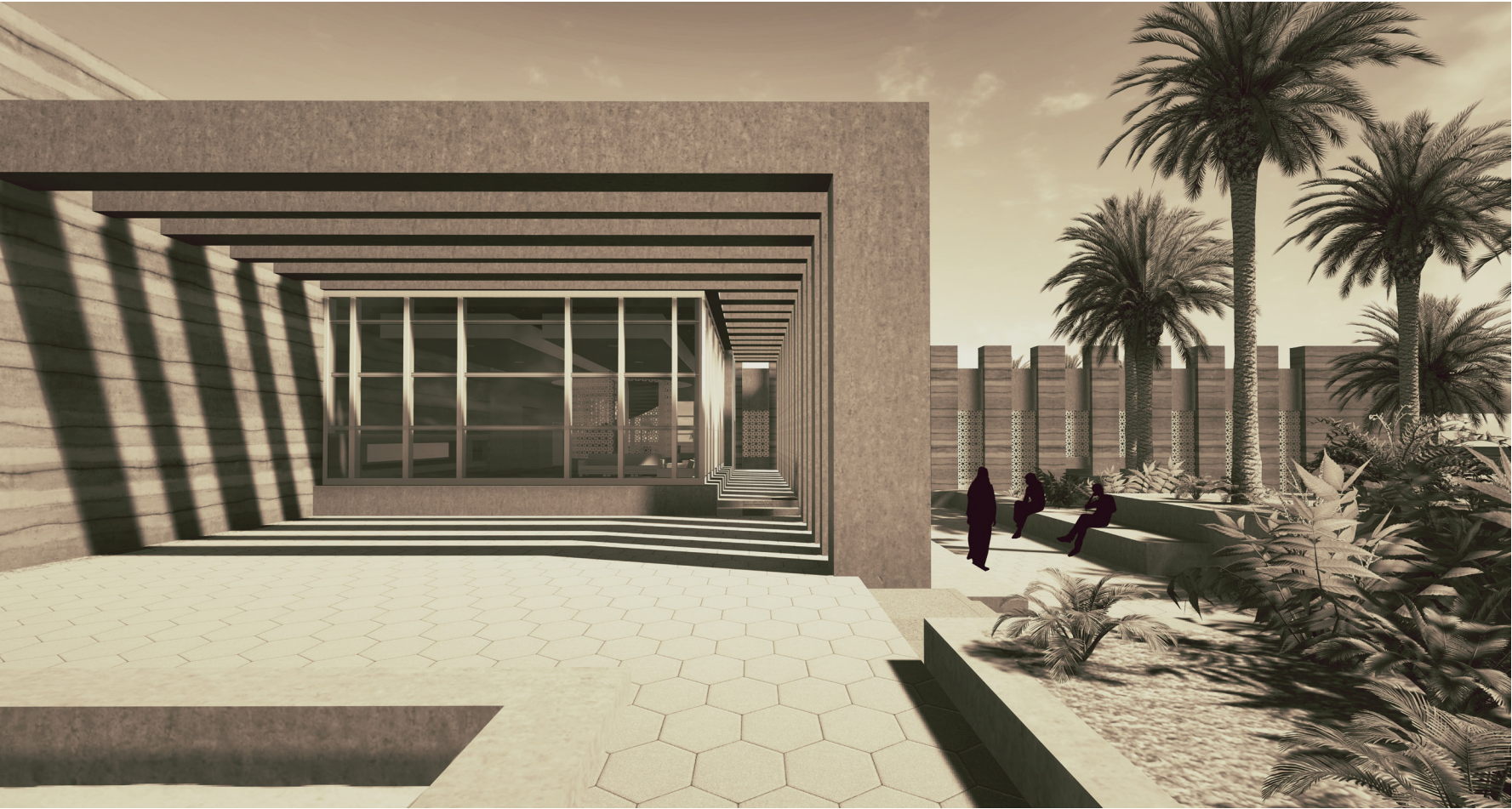
Final Phase Perspectives



Guests Entrance.

PERSPECTIVES

Perspectives Final Phase



View From The Back Garden.

PERSPECTIVES

Final Phase Perspectives



Exterior Path.

PERSPECTIVES

Perspectives

Final Phase



Exterior Path.

PERSPECTIVES

Final Phase Perspectives



Back Garden.

PERSPECTIVES

Perspectives

Final Phase



PERSPECTIVES

Final Phase Perspectives



South East Garden.

PERSPECTIVES

Perspectives Final Phase



PERSPECTIVES

Final Phase Perspectives

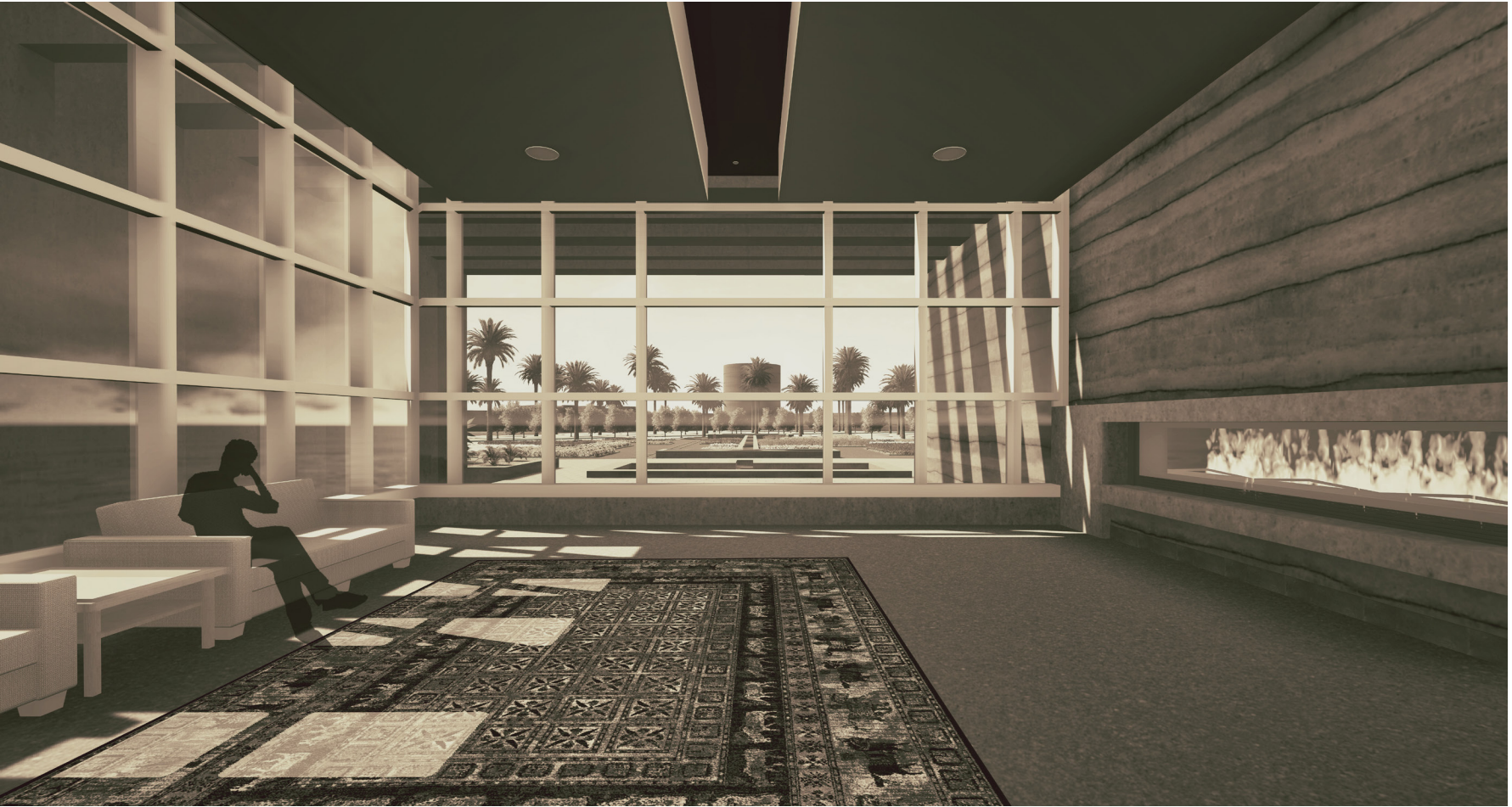


The Back Garden.

PERSPECTIVES

Perspectives

Final Phase



Living Room.

PERSPECTIVES

Final Phase Perspectives



Interior Space.

PERSPECTIVES

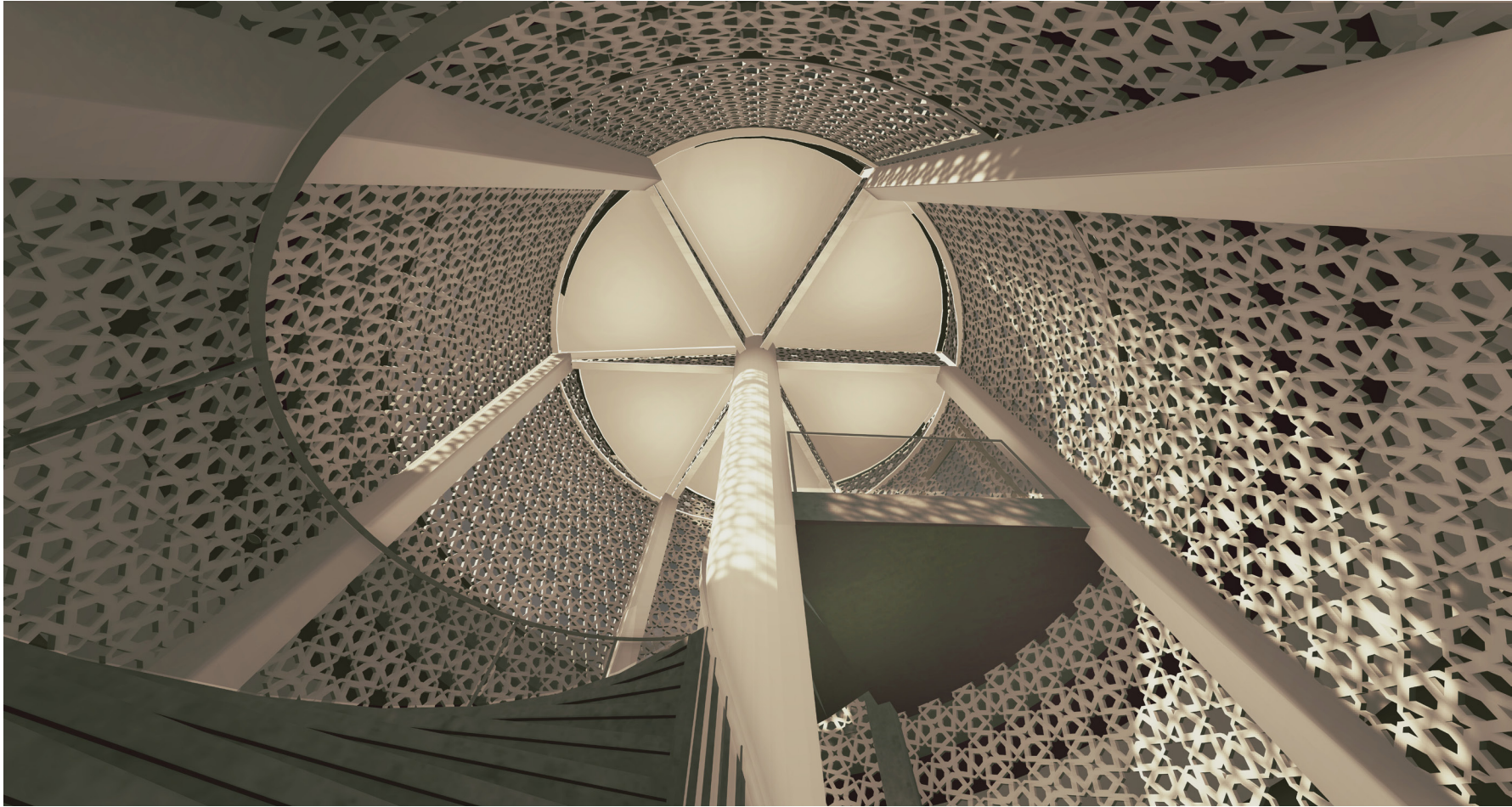
Perspectives

Final Phase



PERSPECTIVES

Final Phase Perspectives



The Stair.

PERSPECTIVES

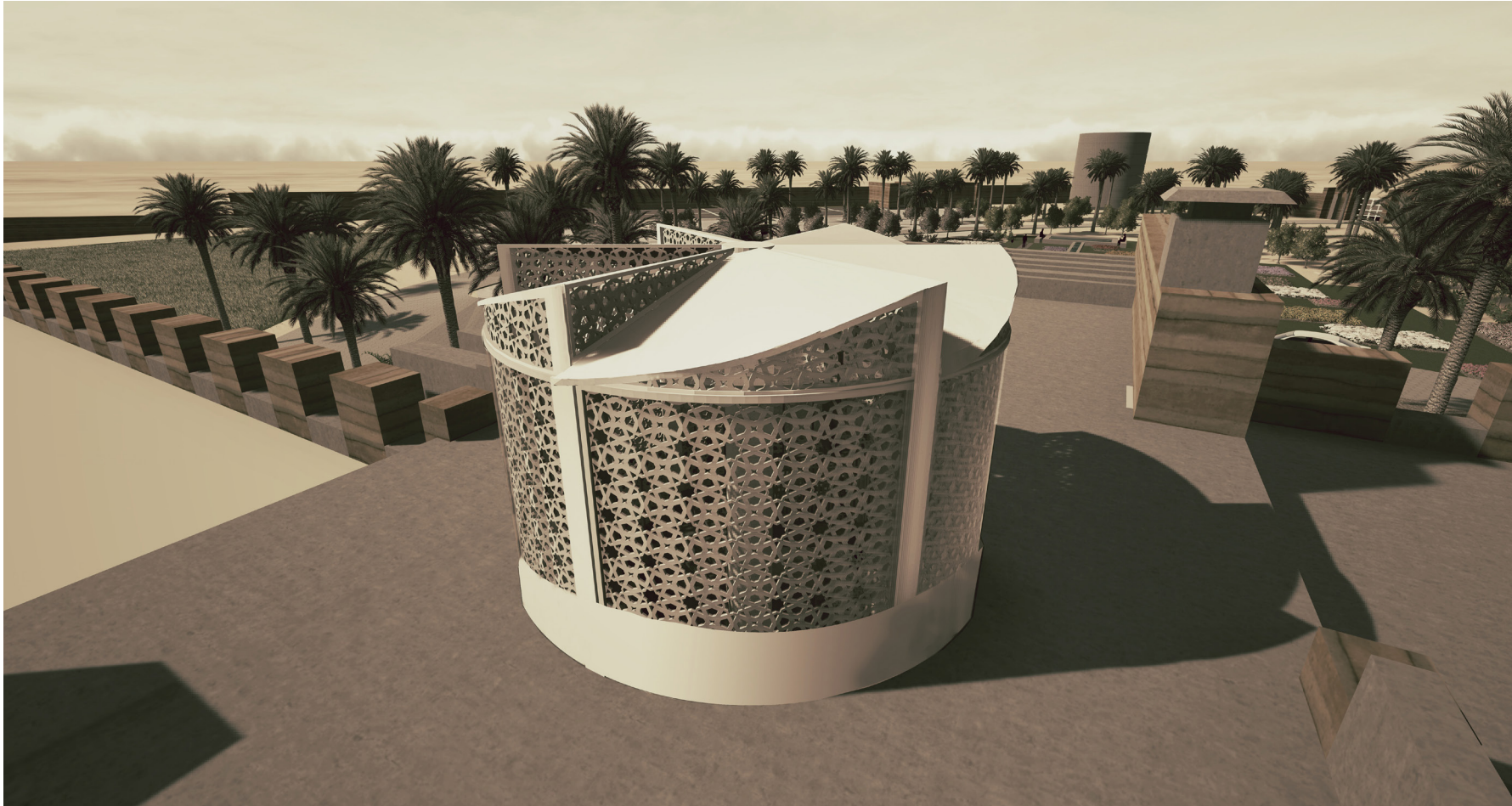
Perspectives

Final Phase



PERSPECTIVES

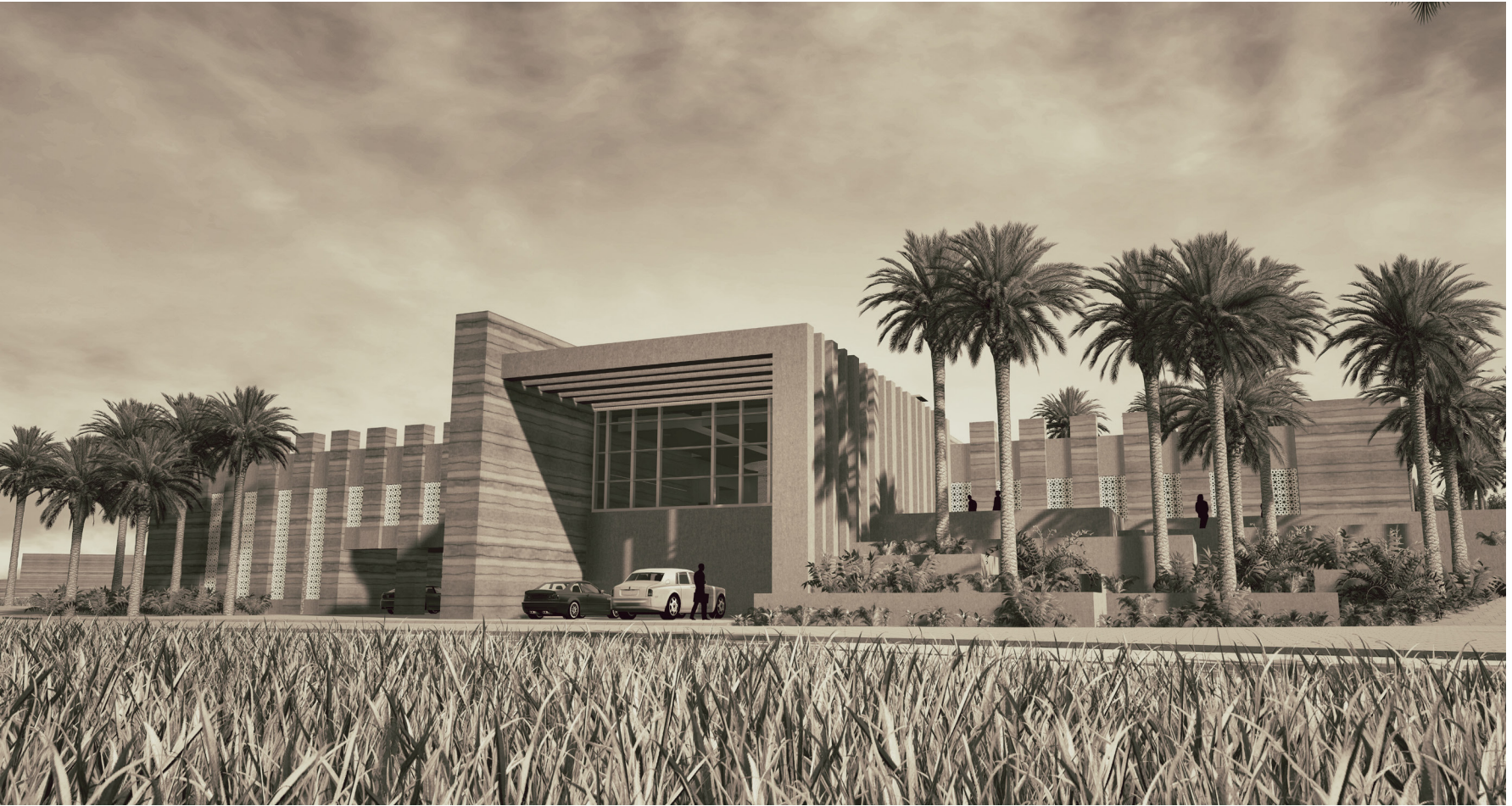
Final Phase Perspectives



The Stair on the Roof.

PERSPECTIVES

Perspectives Final Phase



General View.

PERSPECTIVES

Final Phase Perspectives



View From the Pivot Irrigation.

RAMMED EARTH

Rammed Earth



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RAMMED EARTH

Rammed Earth

Shaqra City is located in a great geographic location that is surrounded by three geological areas. The soils have been taken from the surrounding areas in order to make the building has the same region spirit. Rocky soil, silt soil and sand soil each of these sites have different characteristic such as color and strength and salt proportion. Silt soil has the high proportion of salt. Rocky soil has a red color. Sand has pores between grains. By combining these types, the final material of rammed earth will have a beautiful texture and color.



Desert Dunes



Silt soil



Rocky soil

RAMMED EARTH TEST

Rammed Earth Test



Sand



Silt Soil



Rocky Soil

Test Samples Before 24 Hours. (This test for determining the ratio between coarse and fine particles)

RAMMED EARTH TEST

Rammed Earth Test



Rocky Soil



Silt Soil



Sand

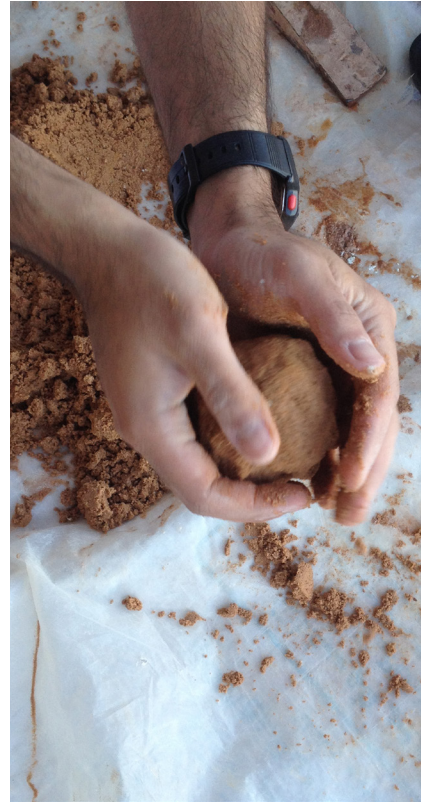
Test Samples After 24 Hours.

SAMPLE PROCESSING

Sample Processing



Adding Water and Mixing.



Consistency Test.



SAMPLE PROCESSING

Sample Processing

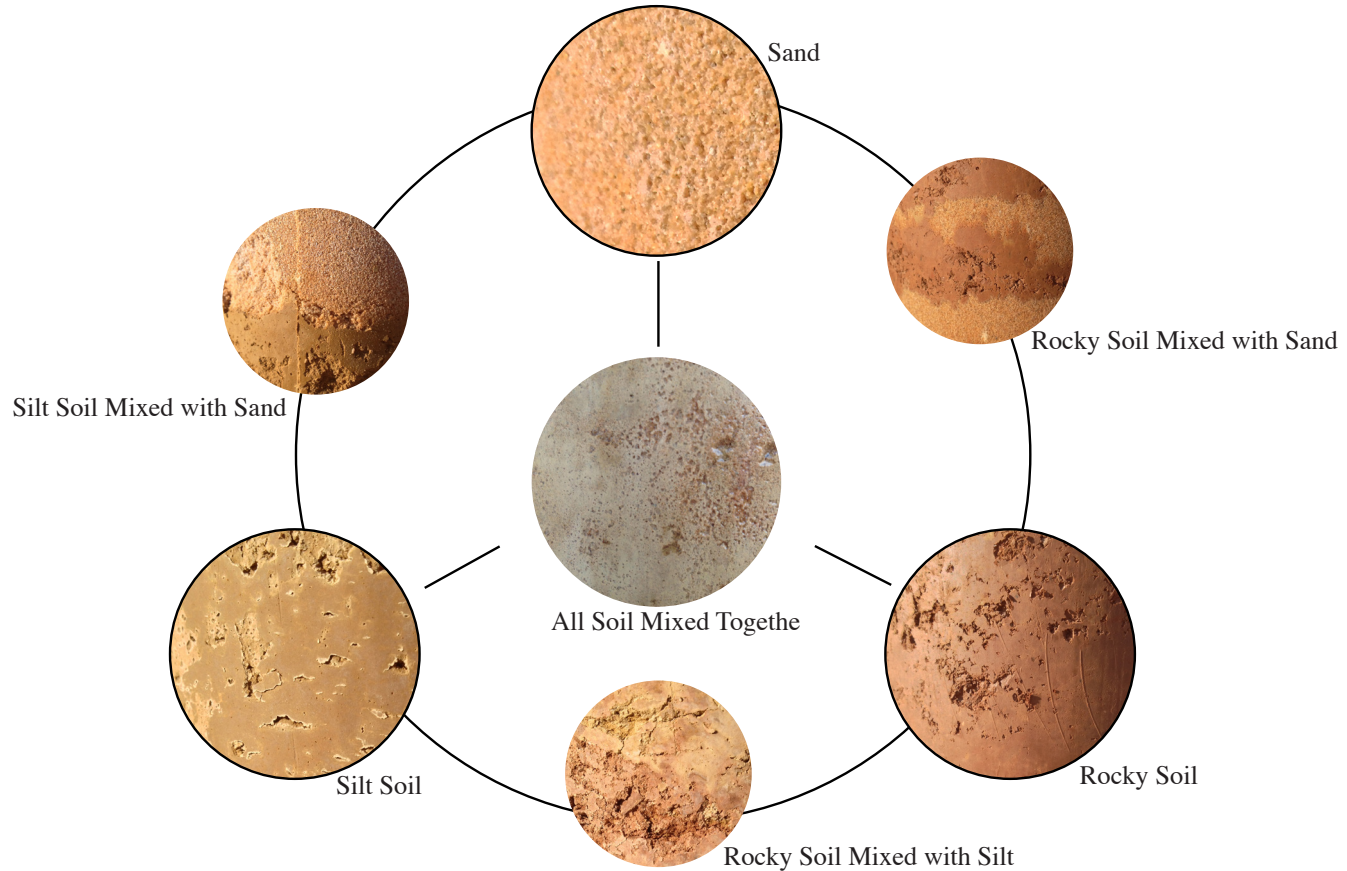


Adding Earth to the Cylinders.

Compact the Earth.

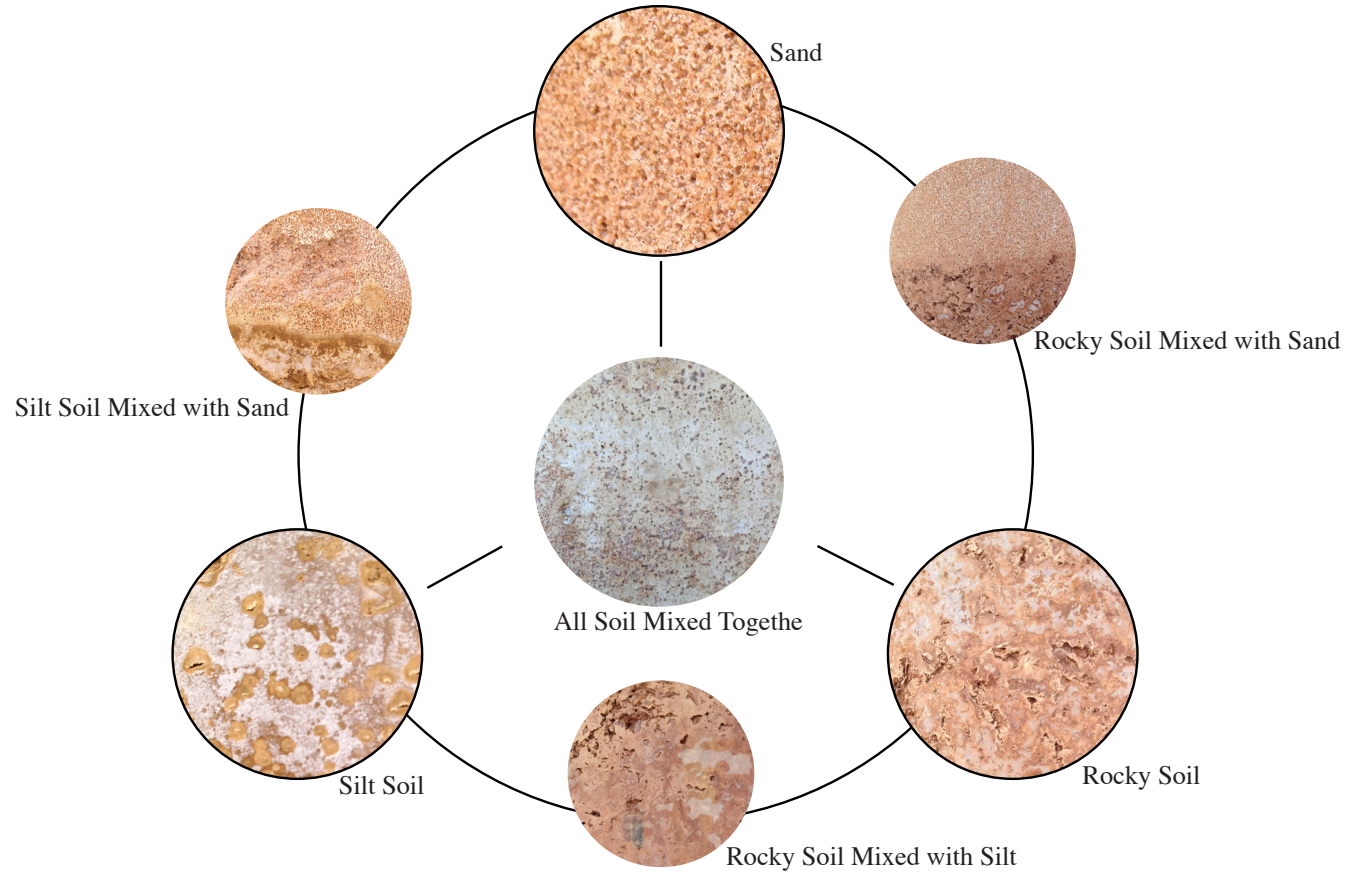
RAMMED EARTH SAMPLES

Rammed Earth Samples



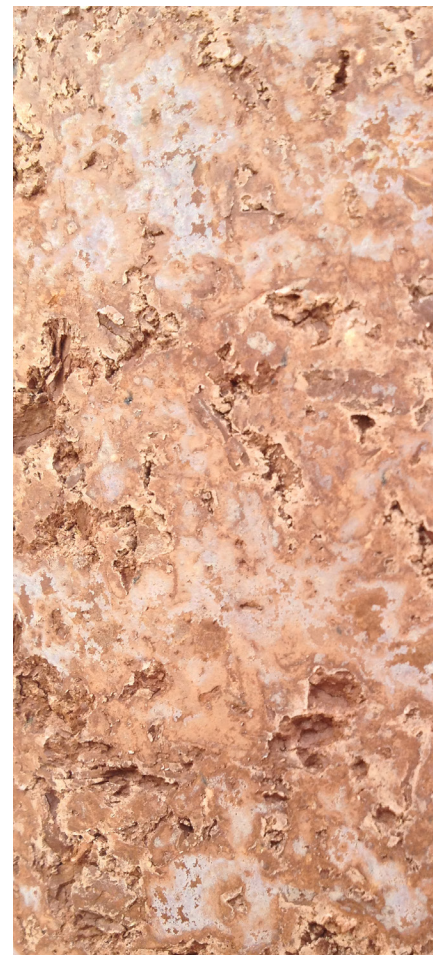
RAMMED EARTH SAMPLES

Rammed Earth Samples



RAMMED EARTH SAMPLES

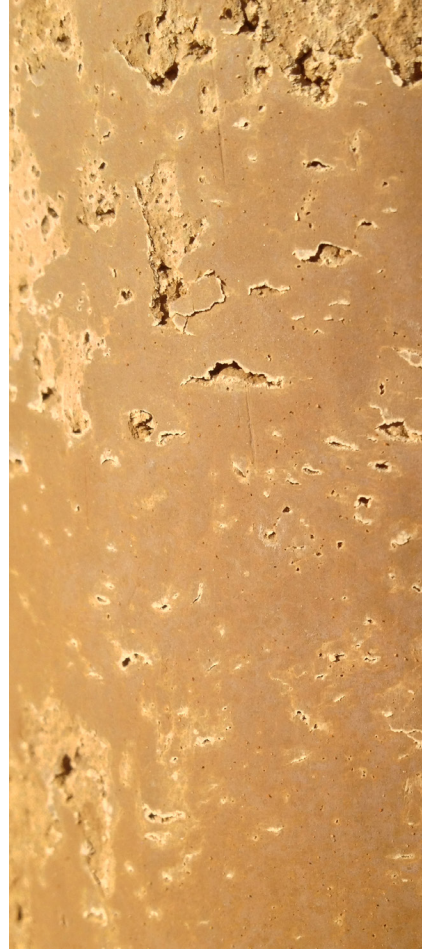
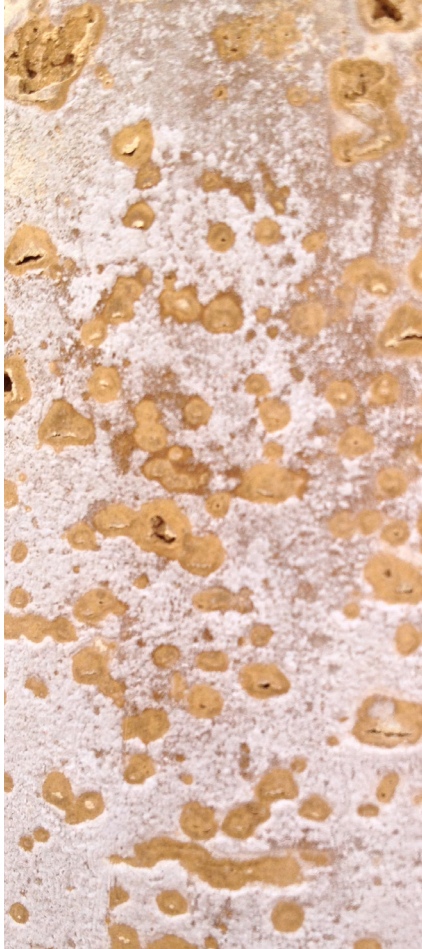
Rammed Earth Samples



Rocky Soil Sample Before and After Drying.
Rocky Soil Sample Texture.

RAMMED EARTH SAMPLES

Rammed Earth Samples



Silt Sample Before and After Drying.
Silt Sample Texture.

RAMMED EARTH SAMPLES

Rammed Earth Samples



Sand Sample Before and After Drying.
Sand Sample Texture.

RAMMED EARTH SAMPLES

Rammed Earth Samples



Silt Mixed with Sand Sample Before and After Drying.
Silt Mixed with Sand Sample Texture.

RAMMED EARTH SAMPLES

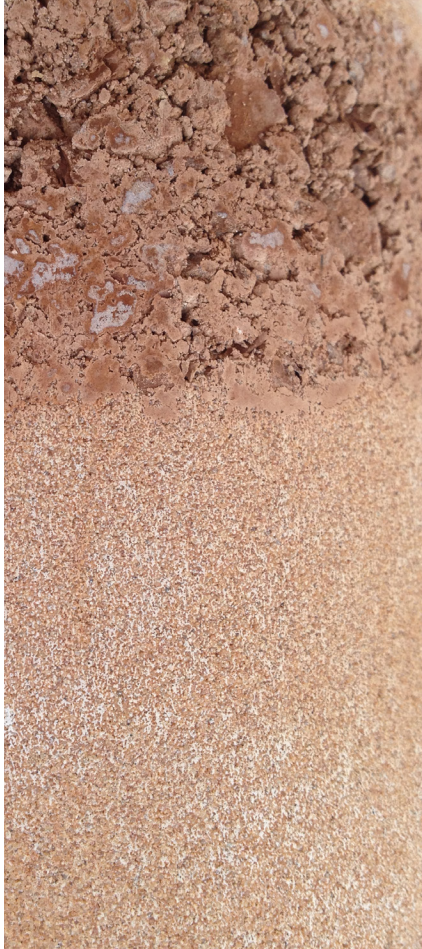
Rammed Earth Samples



Rocky Soil Mixed with Silt Sample Before and After Drying.
Rocky Soil Mixed with Silt Sample Texture.

RAMMED EARTH SAMPLES

Rammed Earth Samples



Rocky Soil Mixed with Sand Sample Before and After Drying.
Rocky Soil Mixed with Sand Sample Texture.

RAMMED EARTH SAMPLES

Rammed Earth Samples



All Soil Mixed Together Sample Before and After Drying.
All Soil Mixed Together Sample Texture.

RAMMED EARTH SAMPLES

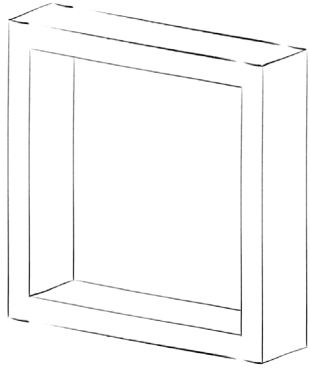
Rammed Earth Samples



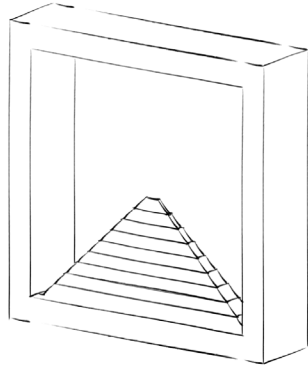
Dry Samples.
Wet Samples.

SHADING PANEL

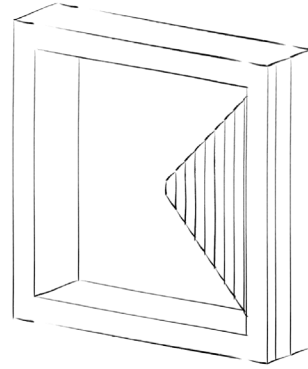
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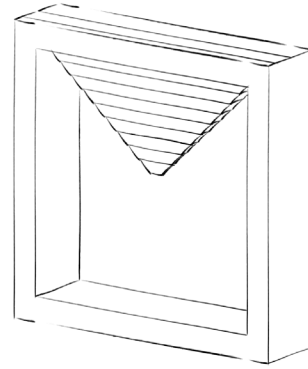
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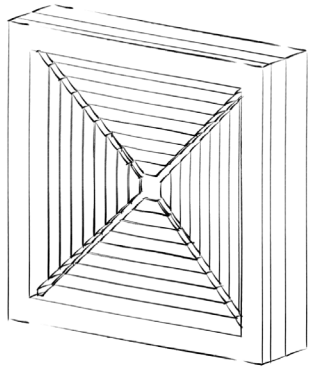
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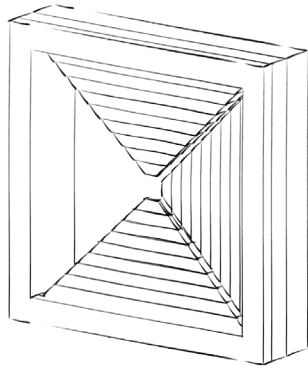
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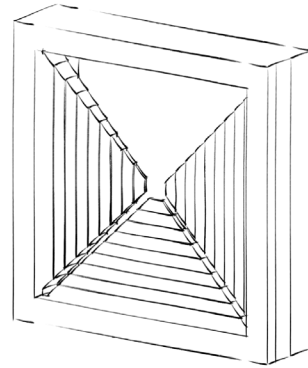
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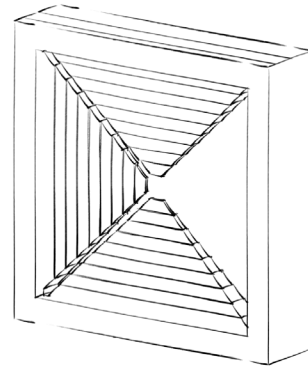
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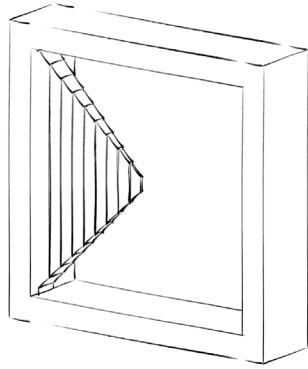
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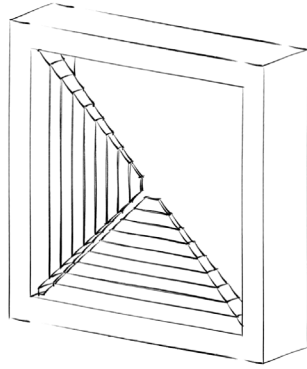
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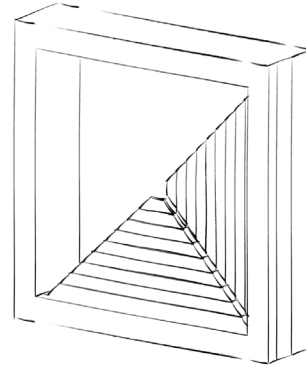
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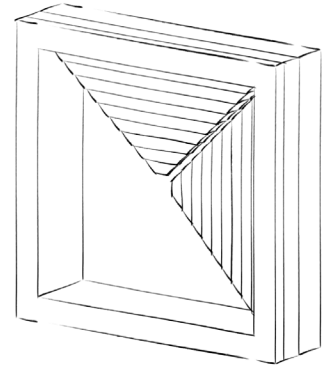
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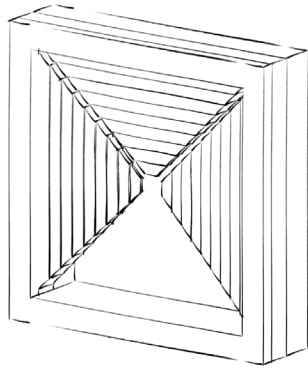
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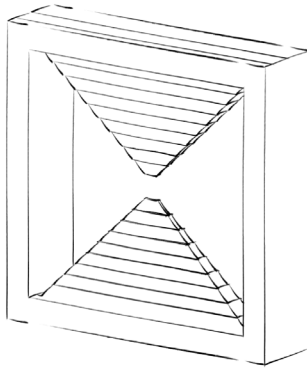
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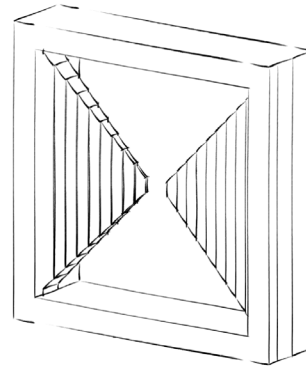
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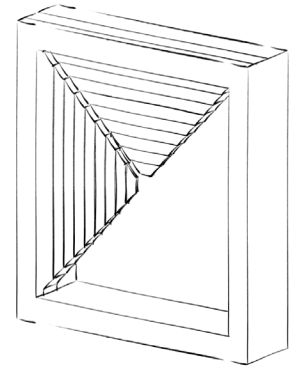
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11



10

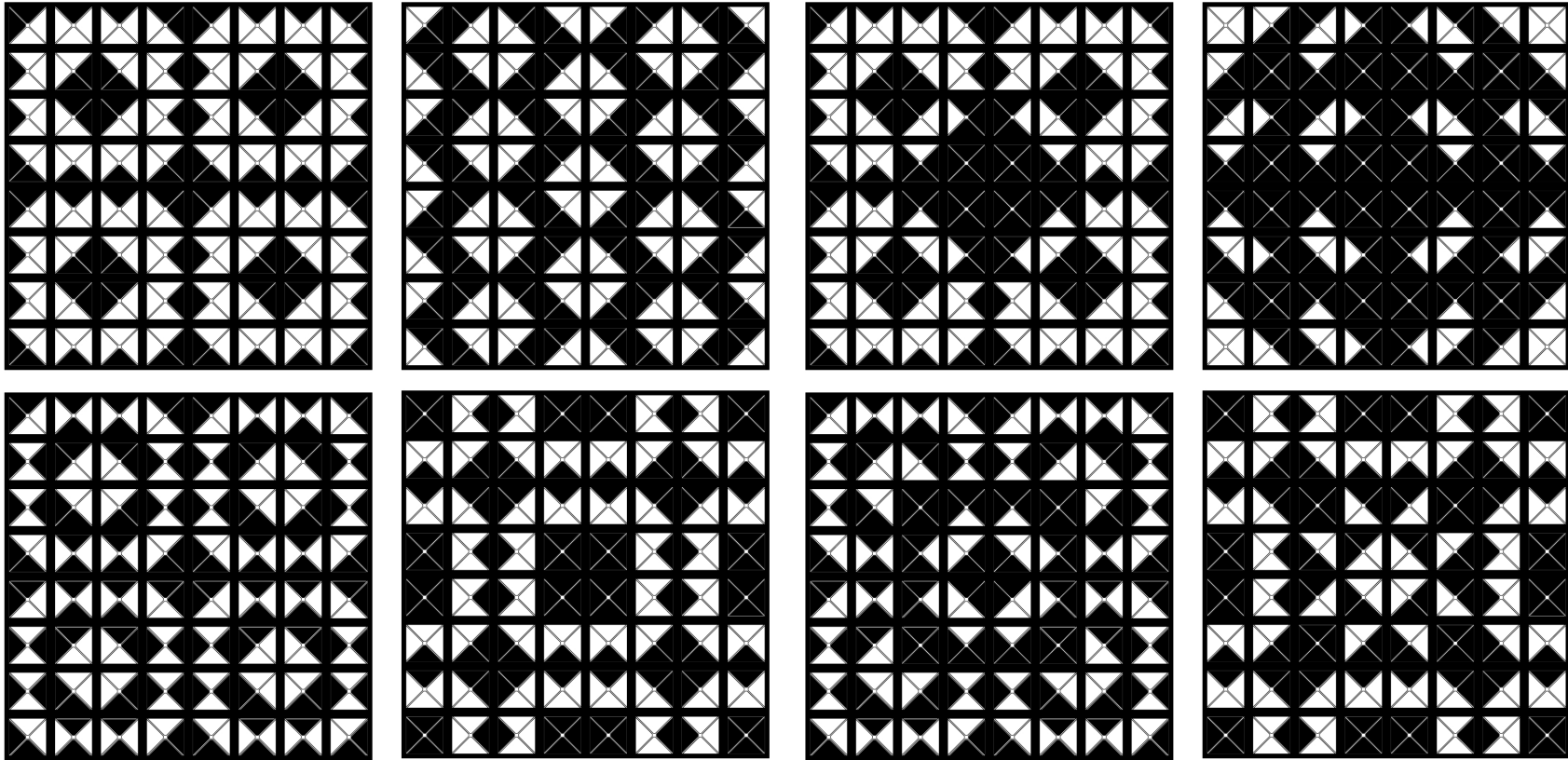


9

One-unit variables

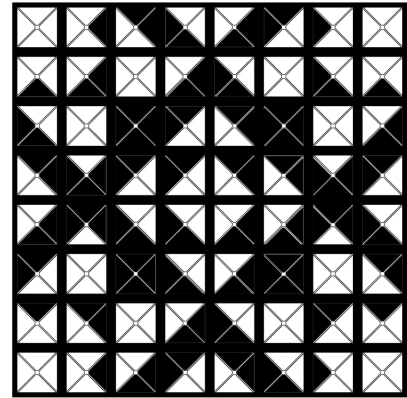
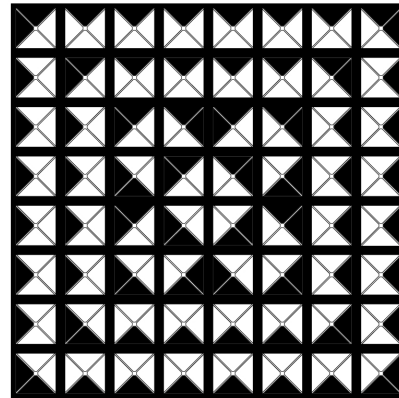
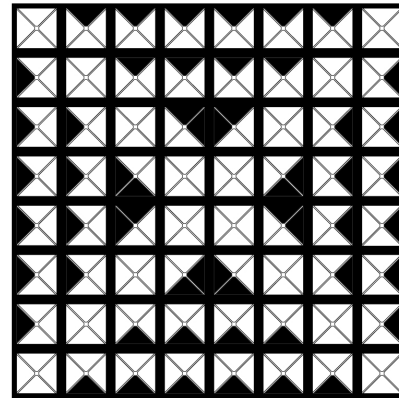
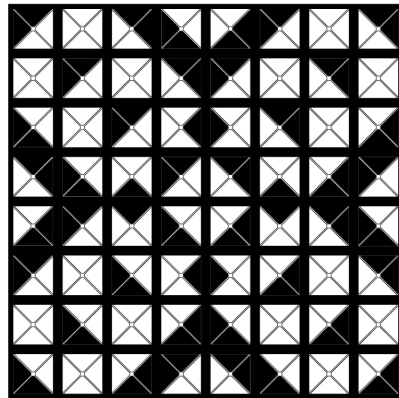
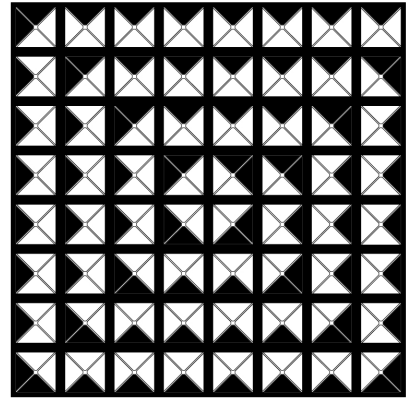
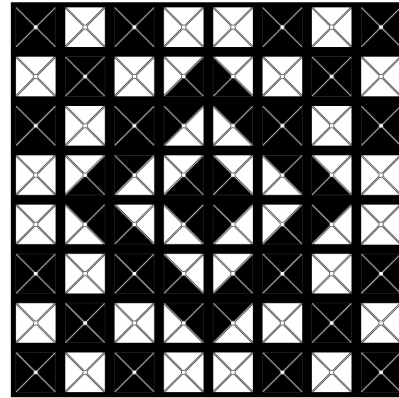
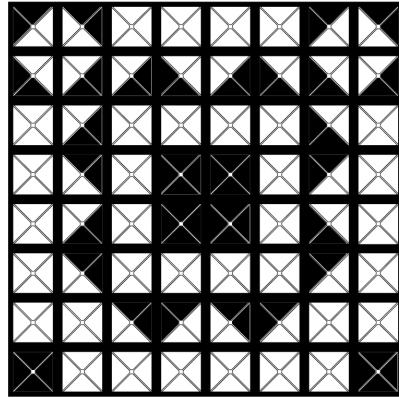
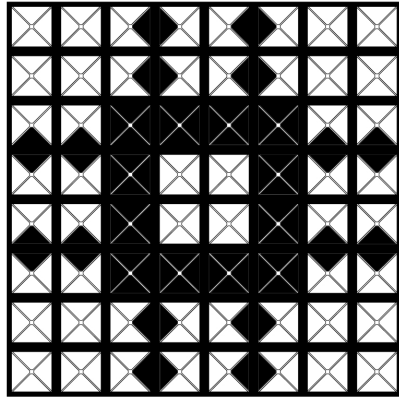
SHADING PANEL

Shading Panel



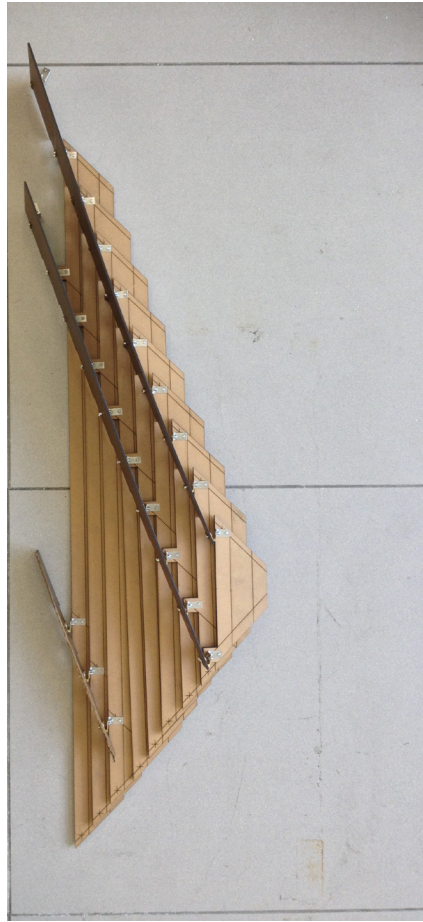
SHADING PANEL

Shading Panel



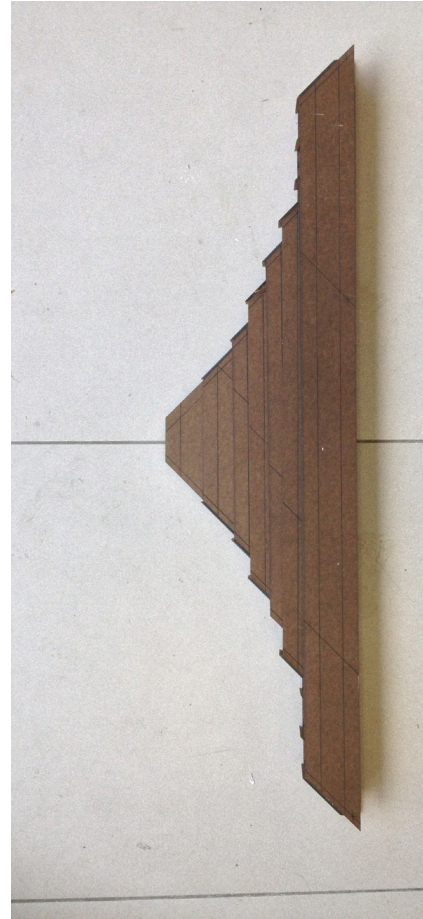
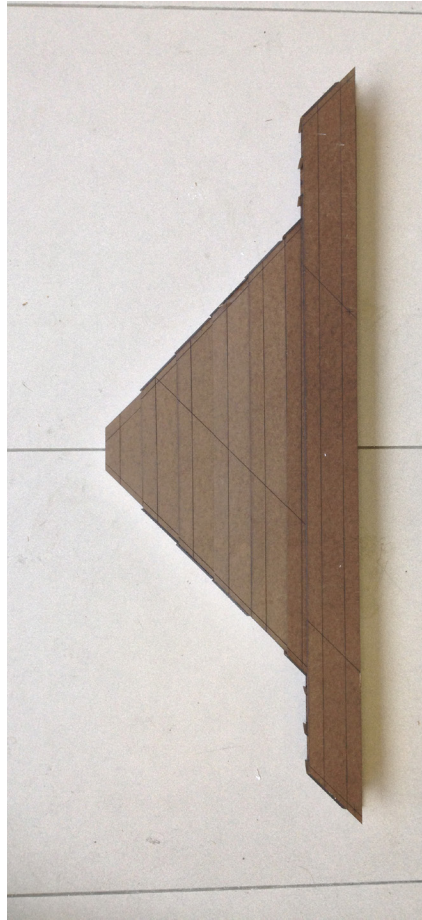
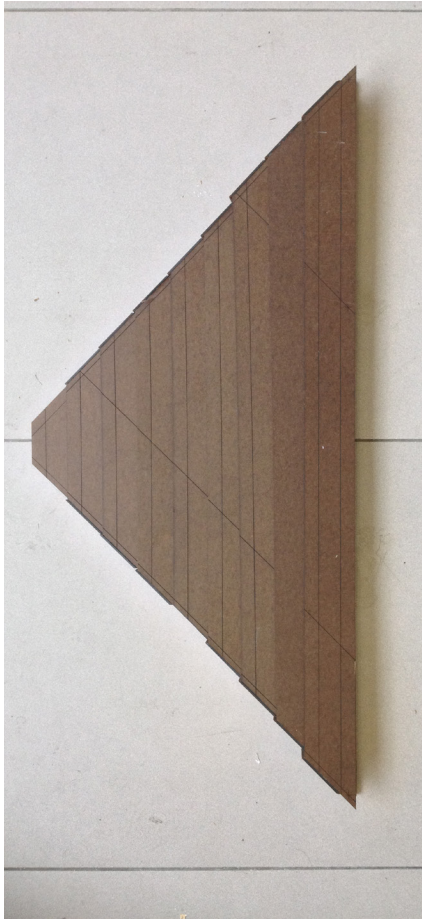
SHADING PANEL

Shading Panel



SHADING PANEL

Shading Panel

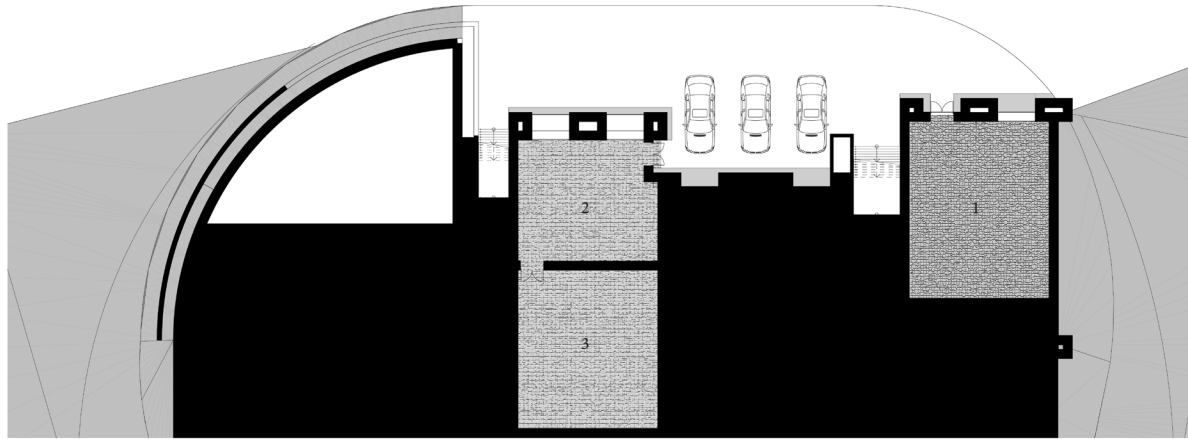


Study model 2

PLANS

Plans

First Phase



- 1 Sitting Room
- 2 Storage
- 3 Machine room

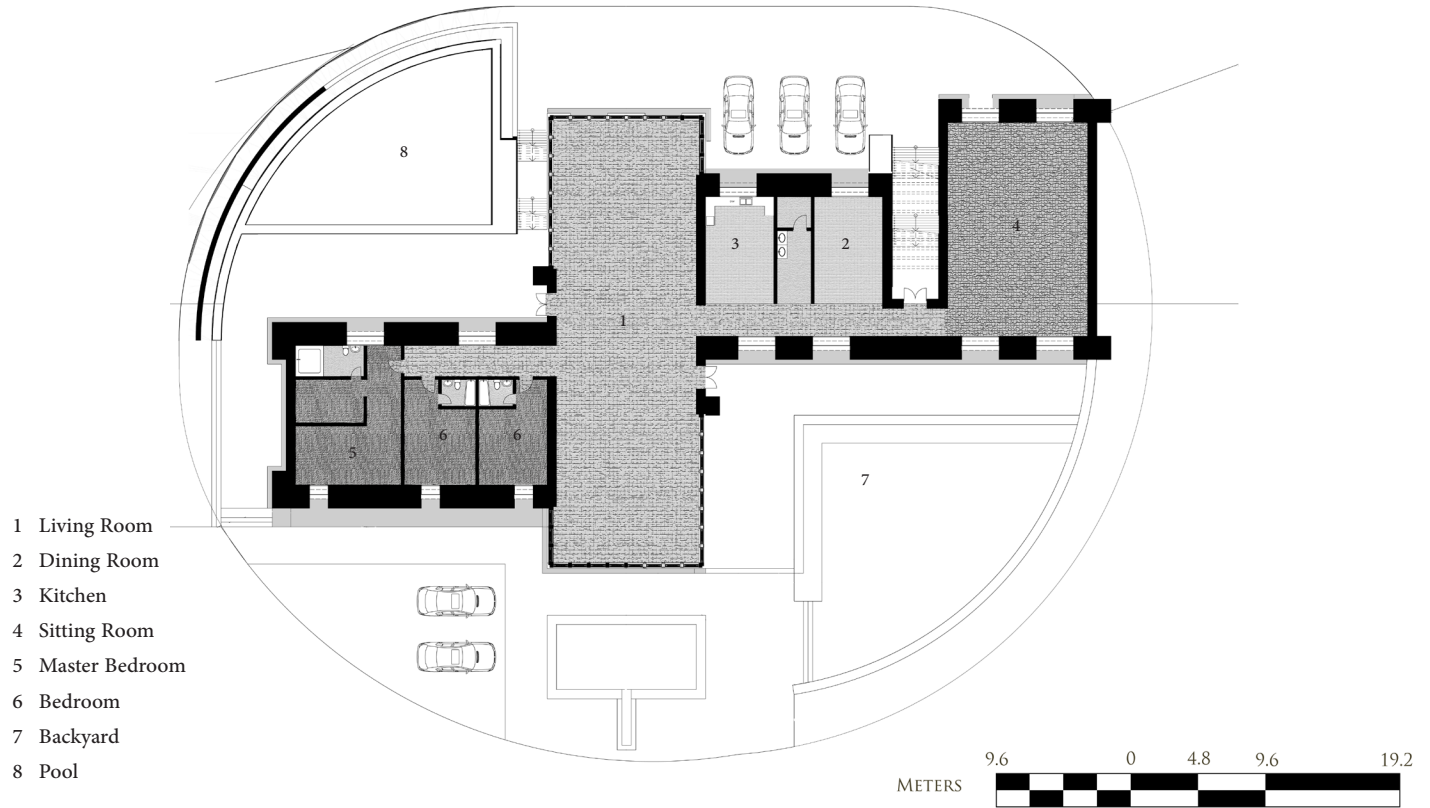


Ground Floor.

PLANS

First Phase

Plans

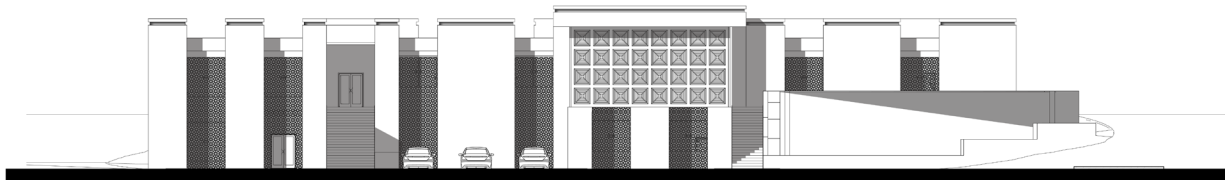


First Floor.

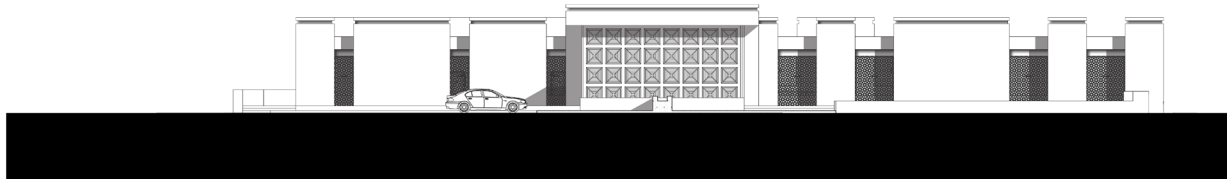
ELEVATIONS

Elevations

First Phase



North Elevation



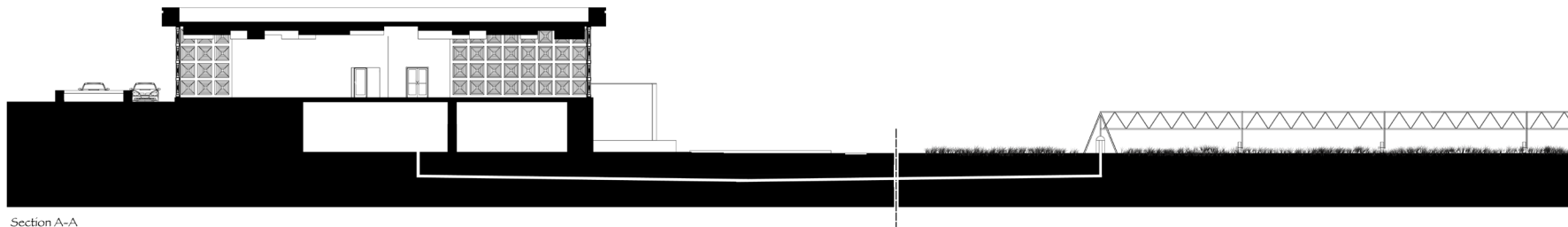
South Elevation



SECTIONS

First Phase

Sections

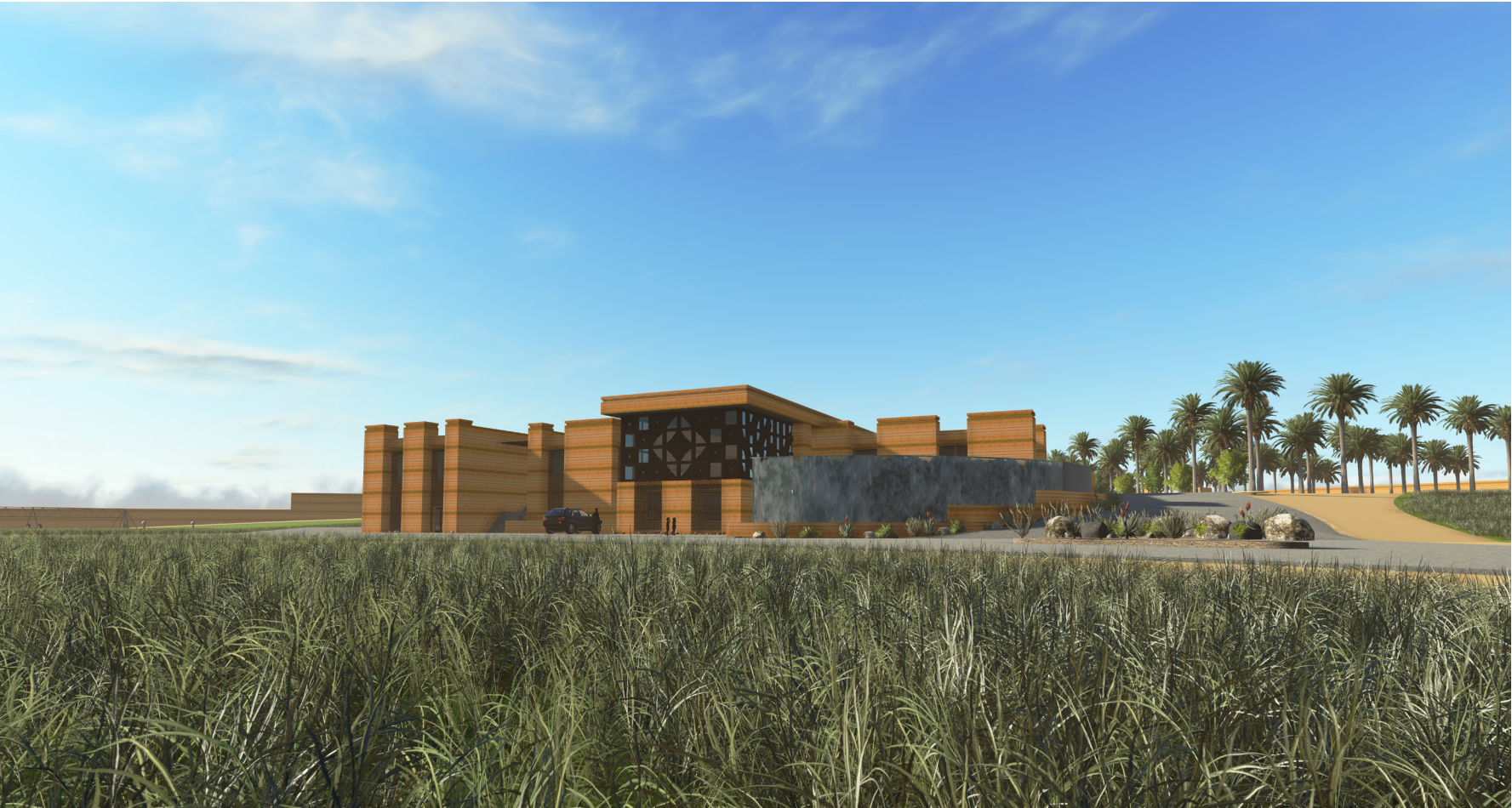


Section A-A



PERSPECTIVES

Perspectives First Phase



General View.

PERSPECTIVES

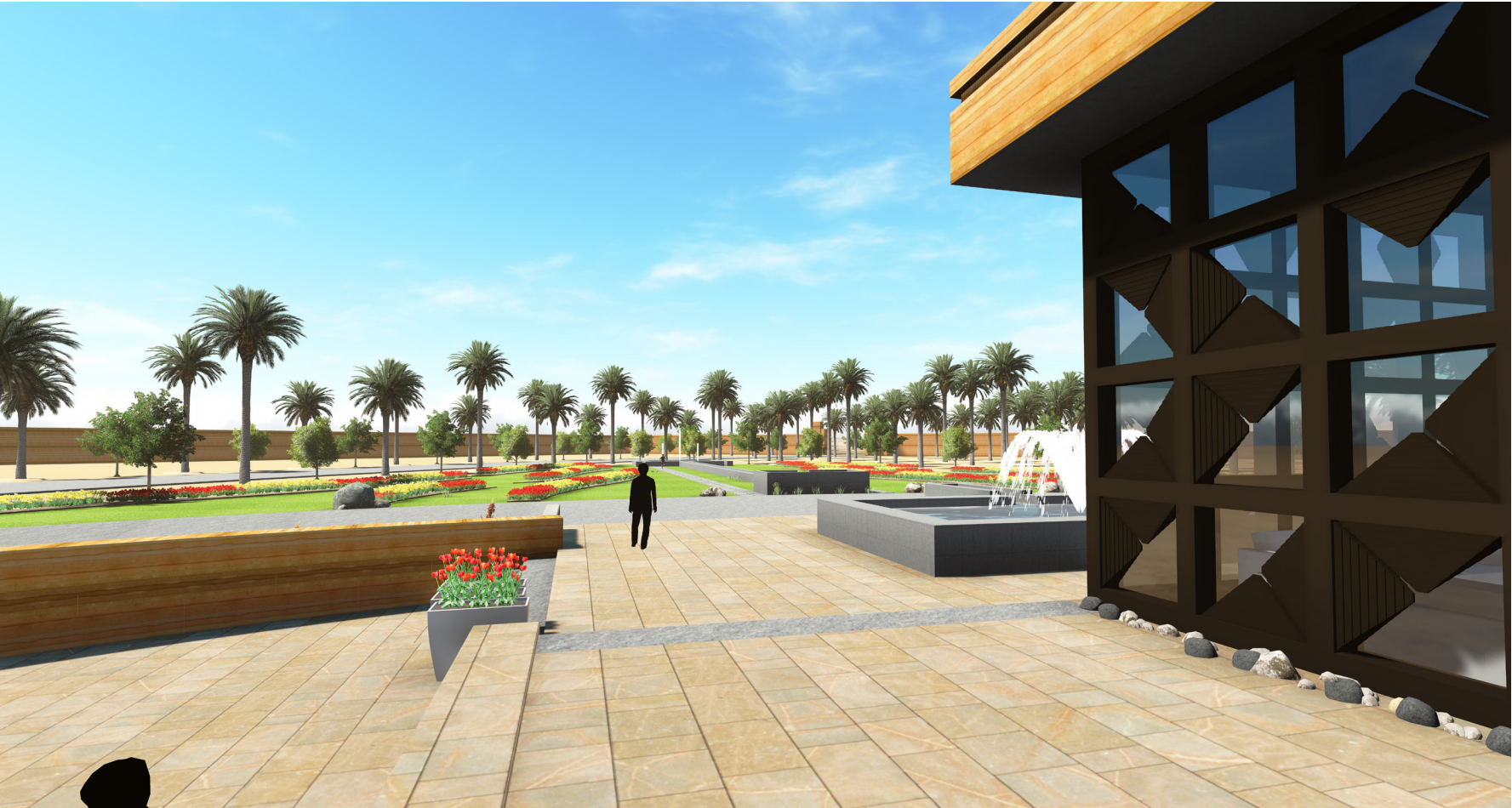
First Phase Perspectives



Interior Corridor.

PERSPECTIVES

Perspectives First Phase



PERSPECTIVES

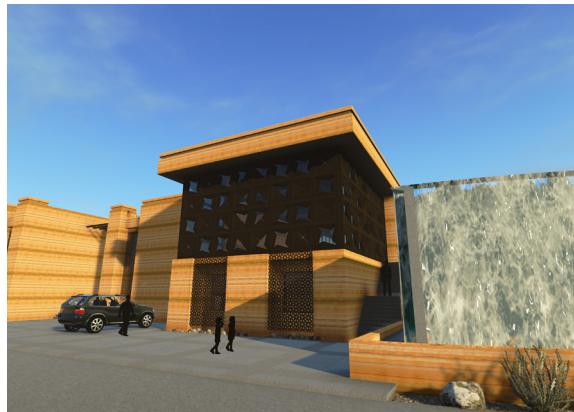
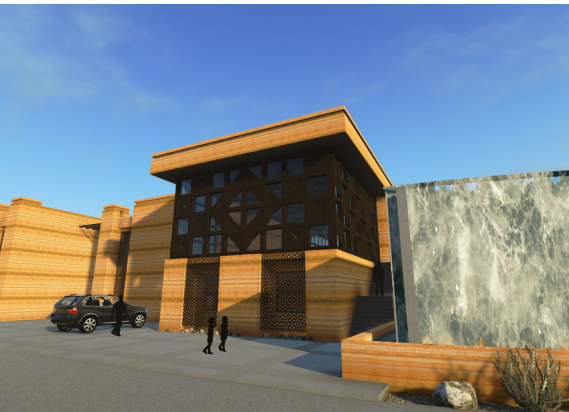
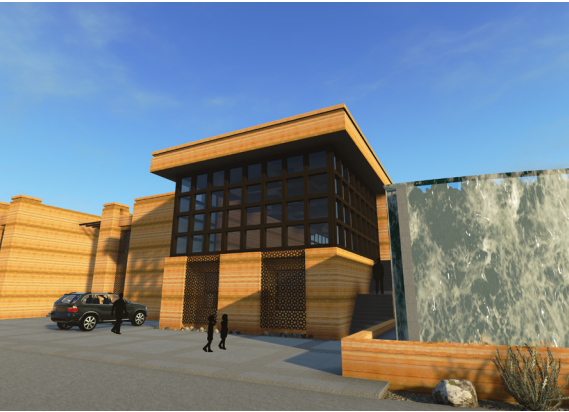
First Phase Perspectives



Backyard.

PERSPECTIVES

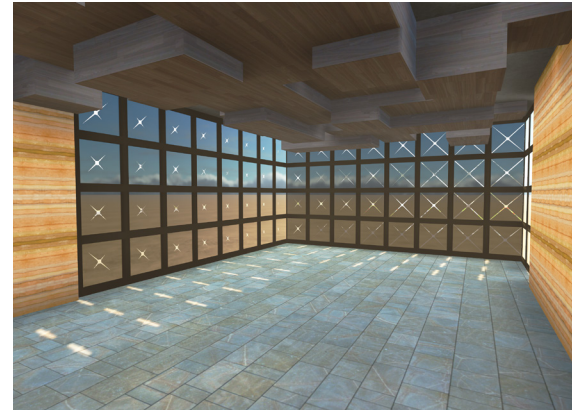
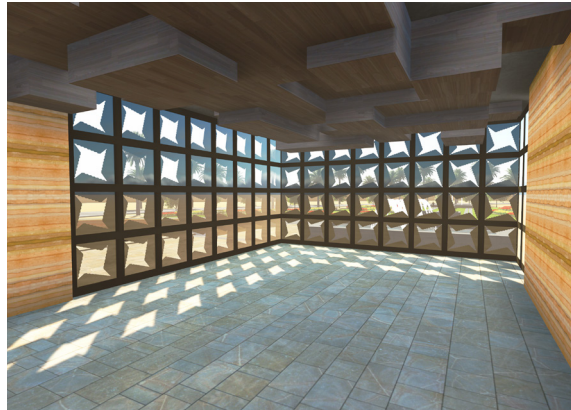
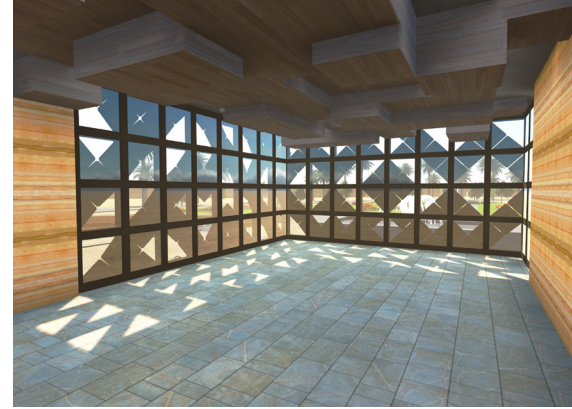
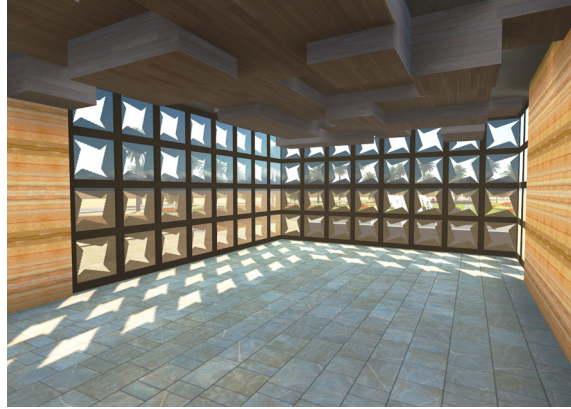
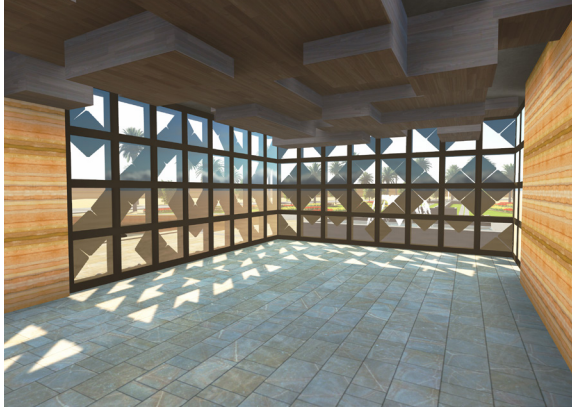
Perspectives First Phase



Panel Movement.

PERSPECTIVES

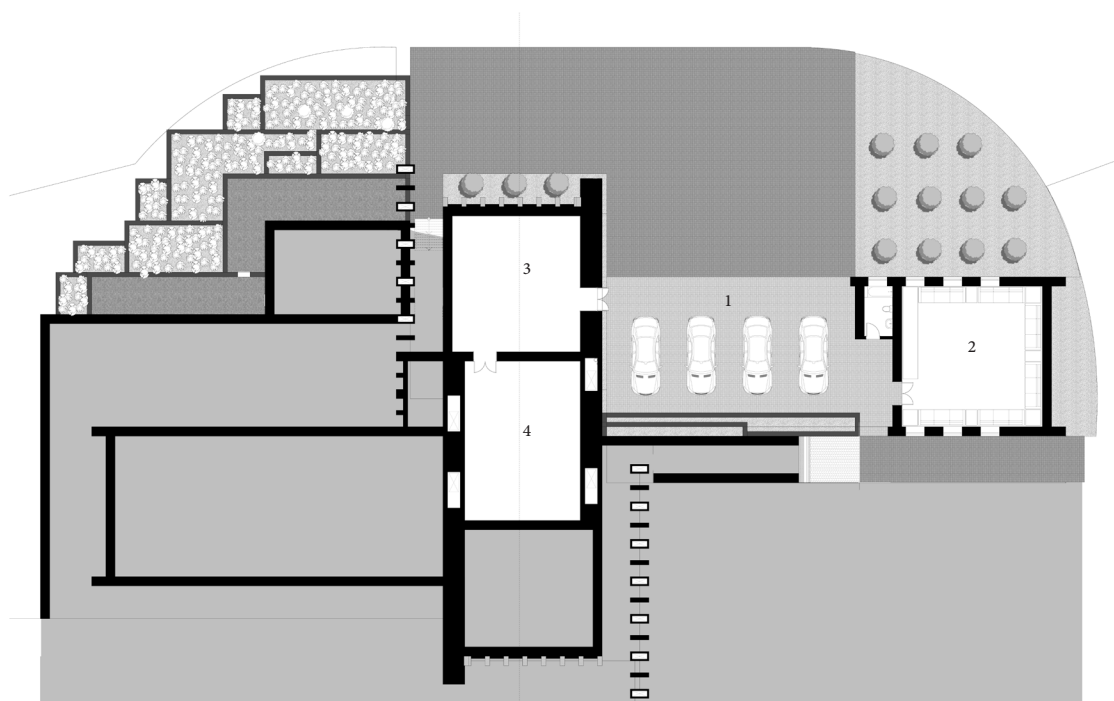
First Phase Perspectives



PLANS

Plans

Second Phase



- 1 Garage
- 2 Sitting Room
- 3 Storage
- 4 Machine room

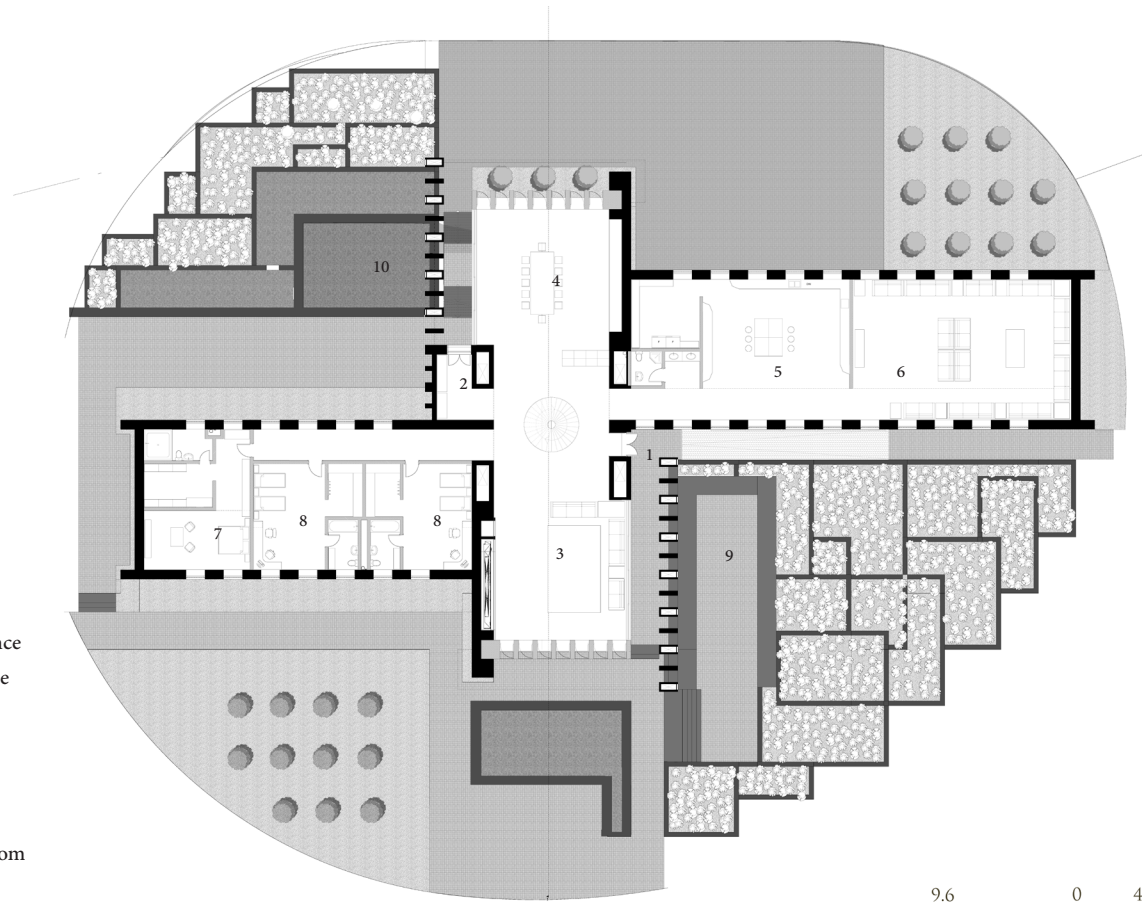


Ground Floor.

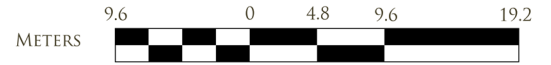
PLANS

Plans

Second Phase



- 1 Family Entrance
- 2 Gests Entrance
- 3 Living Room
- 4 Dining Room
- 5 Kitchen
- 6 Sitting Room
- 7 Master Bedroom
- 8 Bedroom
- 9 Backyard
- 10 Pool

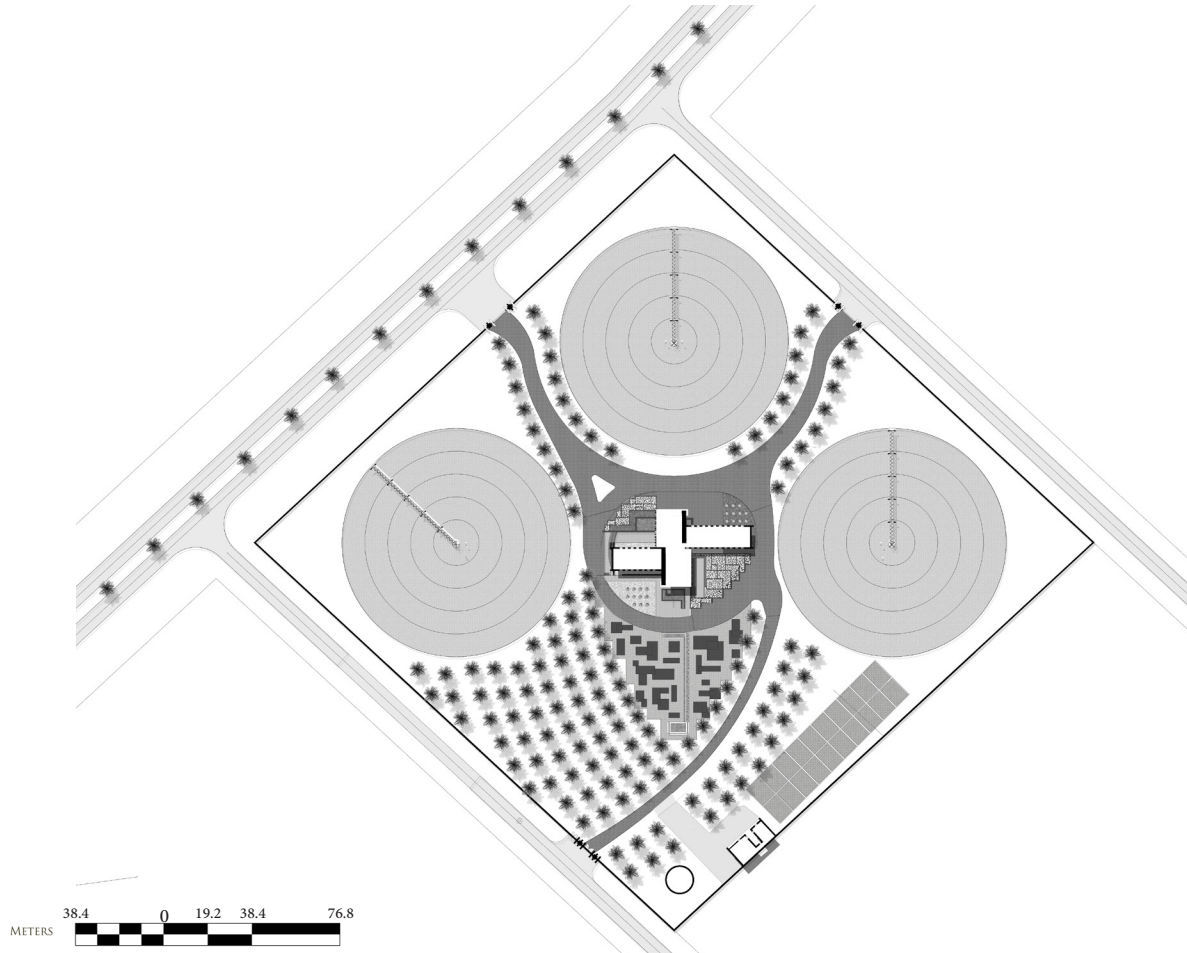


First Floor.

PLANS

Plans

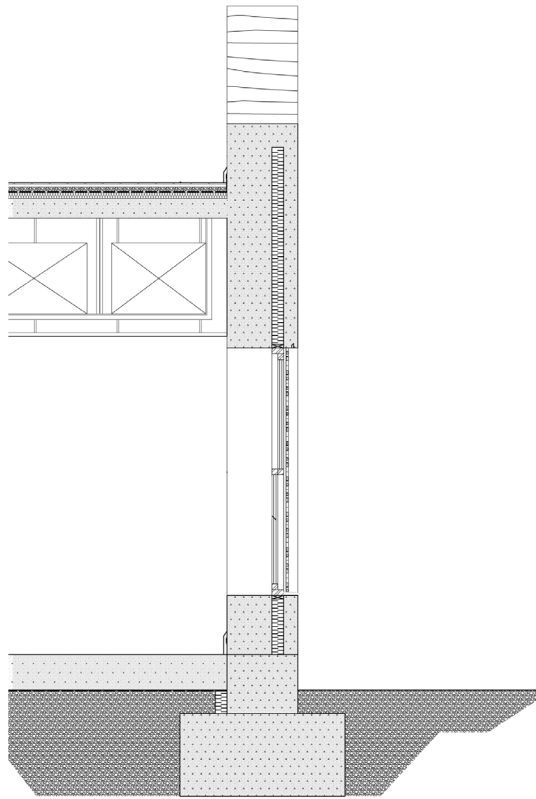
Second Phase



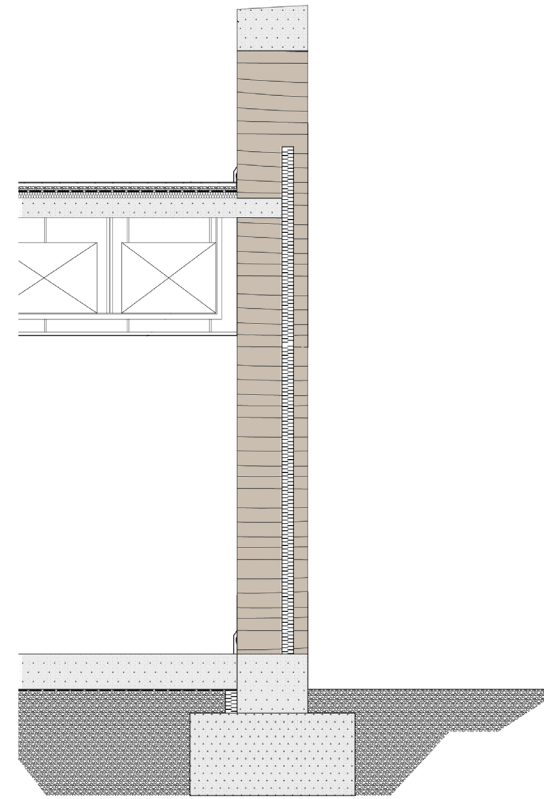
Site Plan.

DETAILS

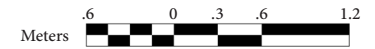
Second Phase Details



Section D1-D1



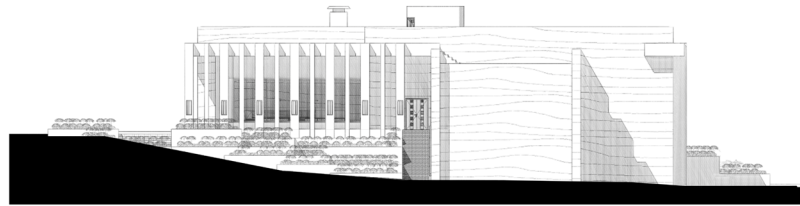
Section D2-D2



ELEVATIONS

Elevations

Second Phase



EAST ELEVATION



NORTH ELEVATION

9.6 0 4.8 9.6 19.2

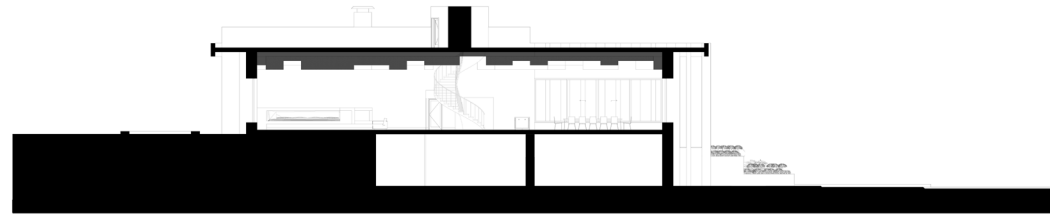
METERS



SECTIONS

Second Phase

Sections

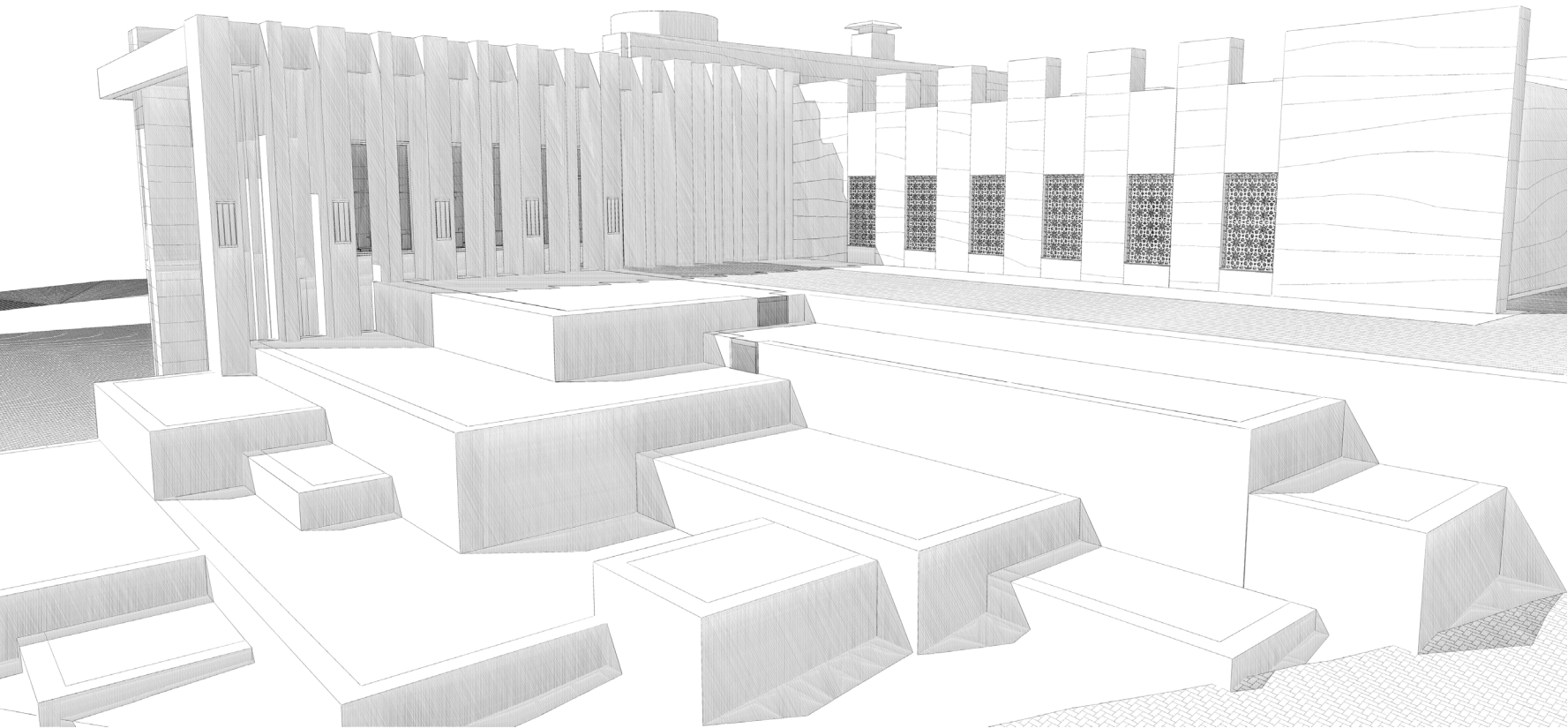


SECTION A-A



PERSPECTIVES

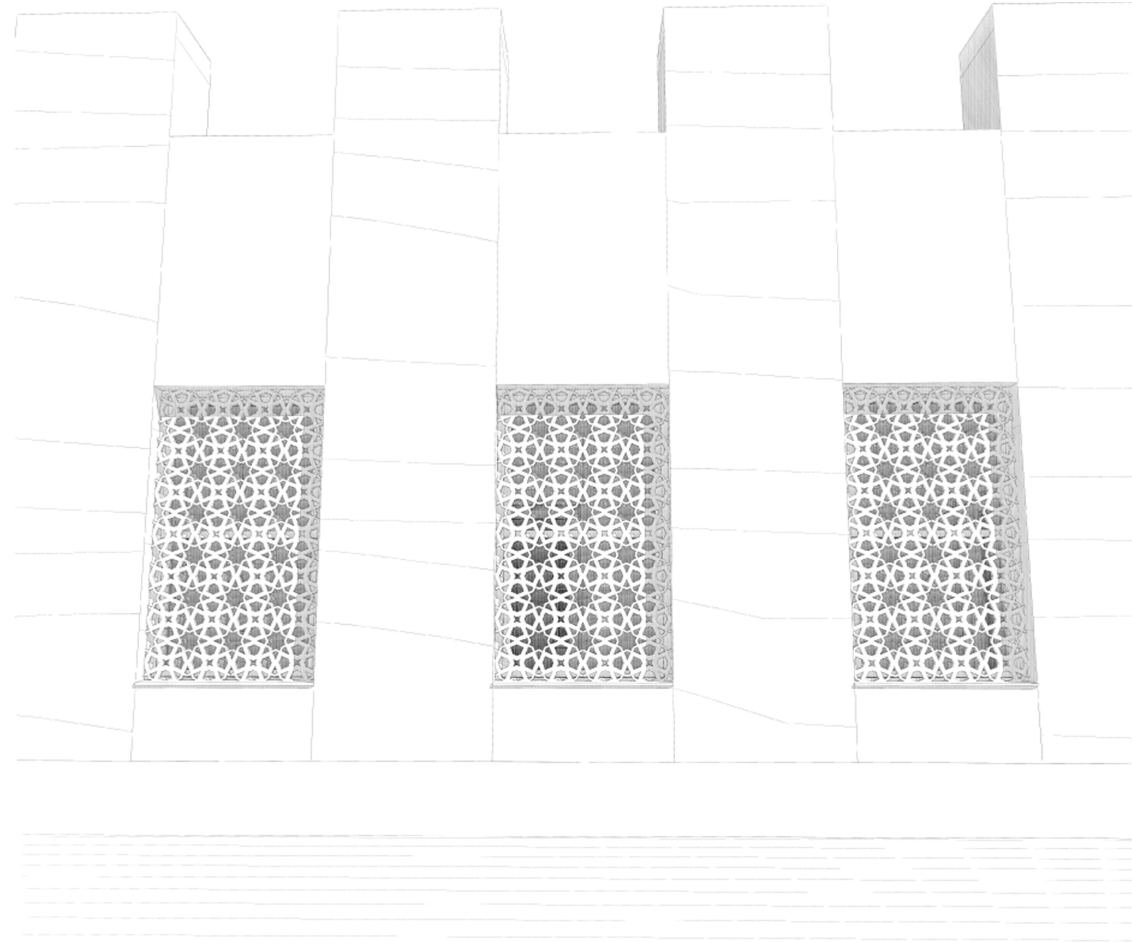
Perspectives Second Phase



Front Garden

PERSPECTIVES

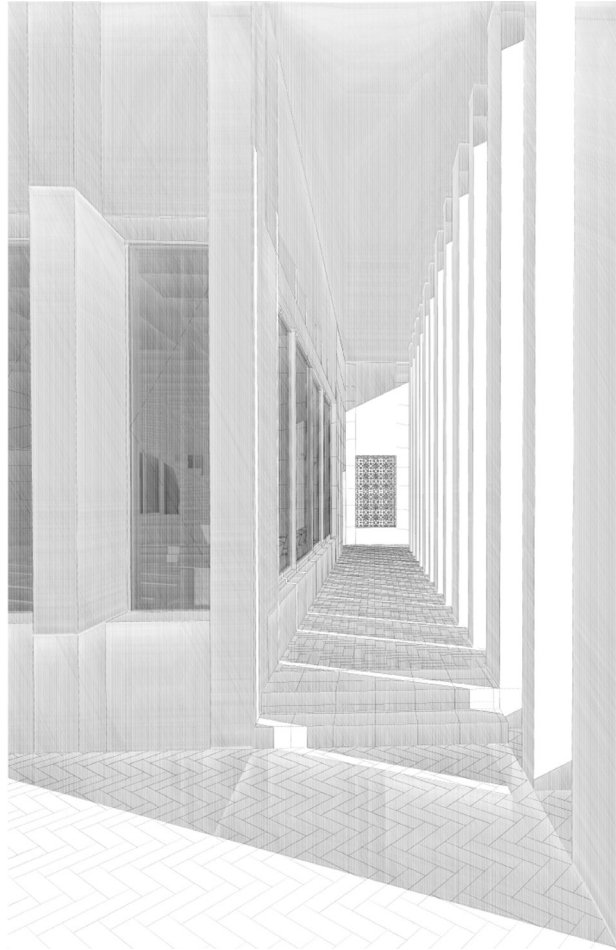
Second Phase Perspectives



The Wall

PERSPECTIVES

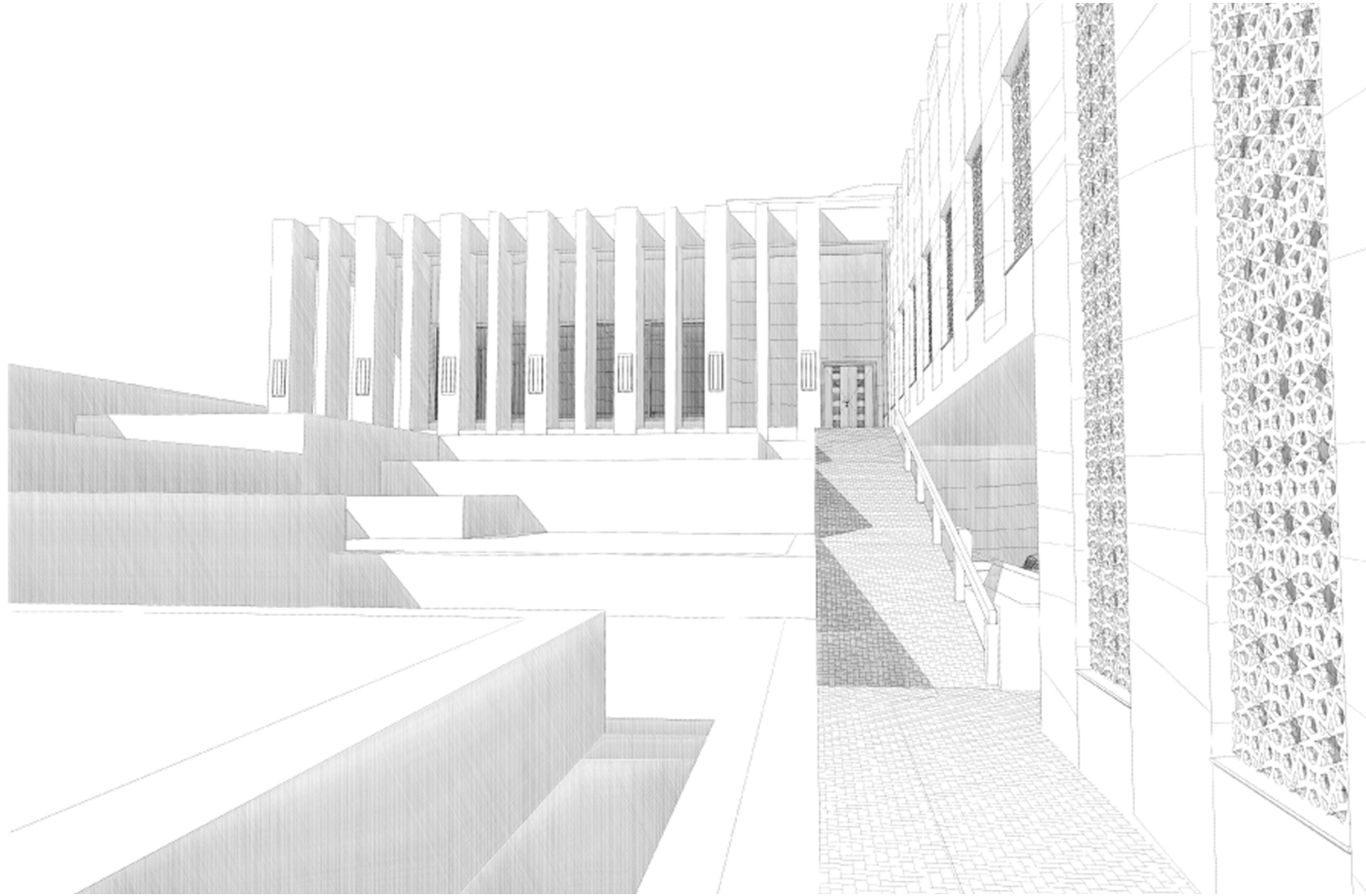
Perspectives Second Phase



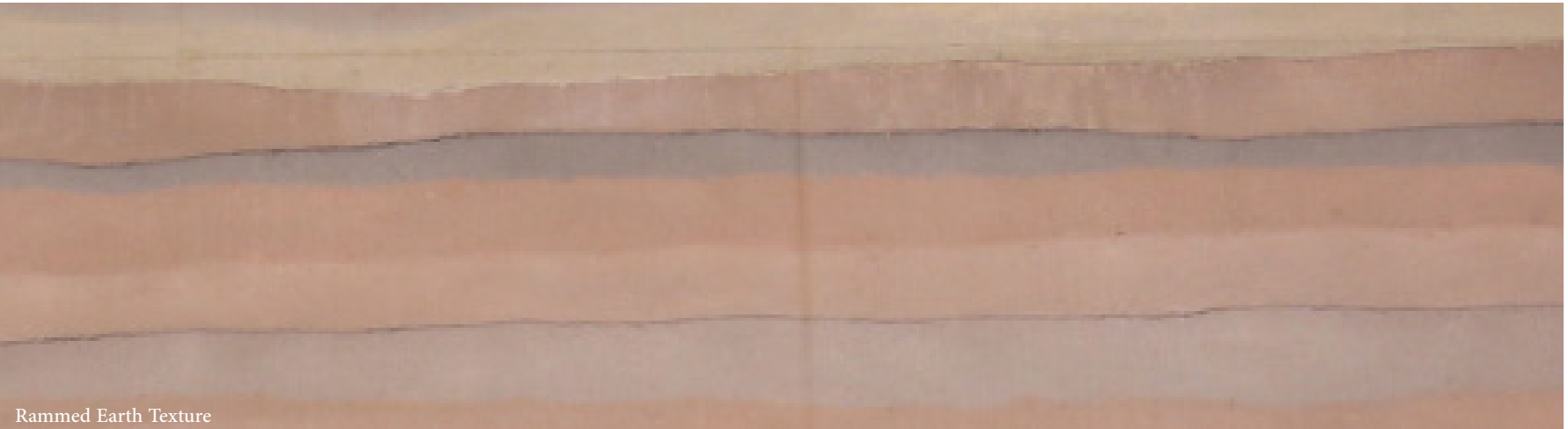
Exterior Path

PERSPECTIVES

Second Phase Perspectives



Family Entrance



Rammed Earth Texture

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