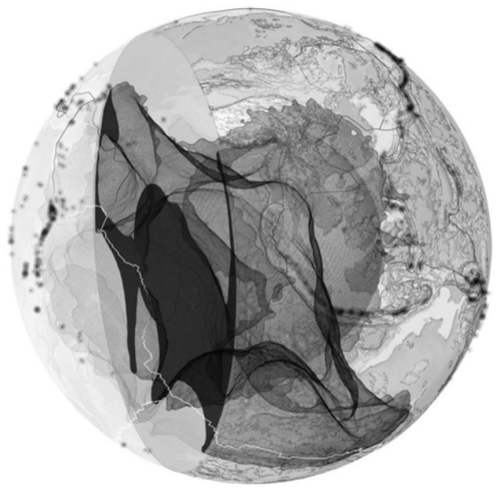
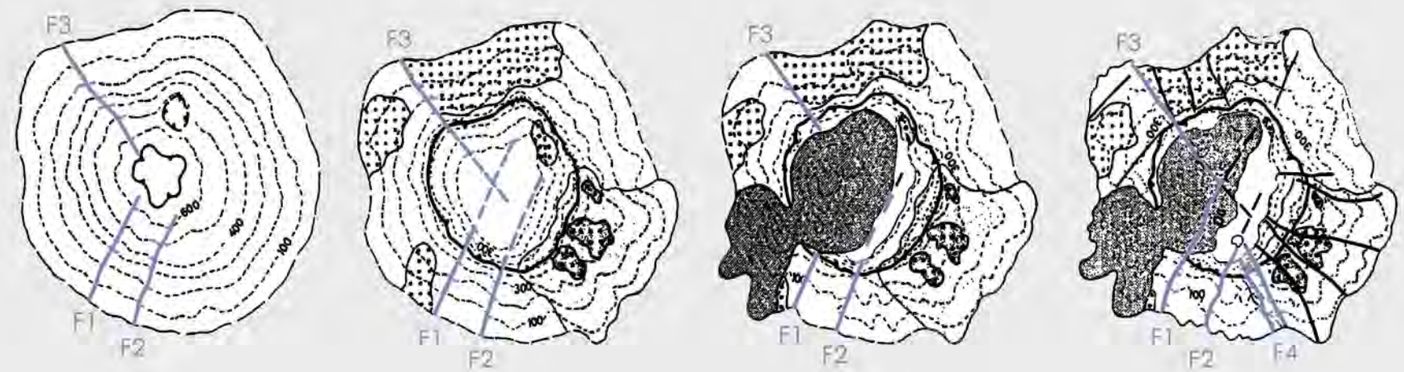


POST- GEOGRAPHIES
WAYS OF INHABITING THE WORLD

ΦΟΙΤΗΤΗΣ:
ΚΑΛΑΝΤΖΗΣ ΠΑΝΑΓΙΩΤΗΣ

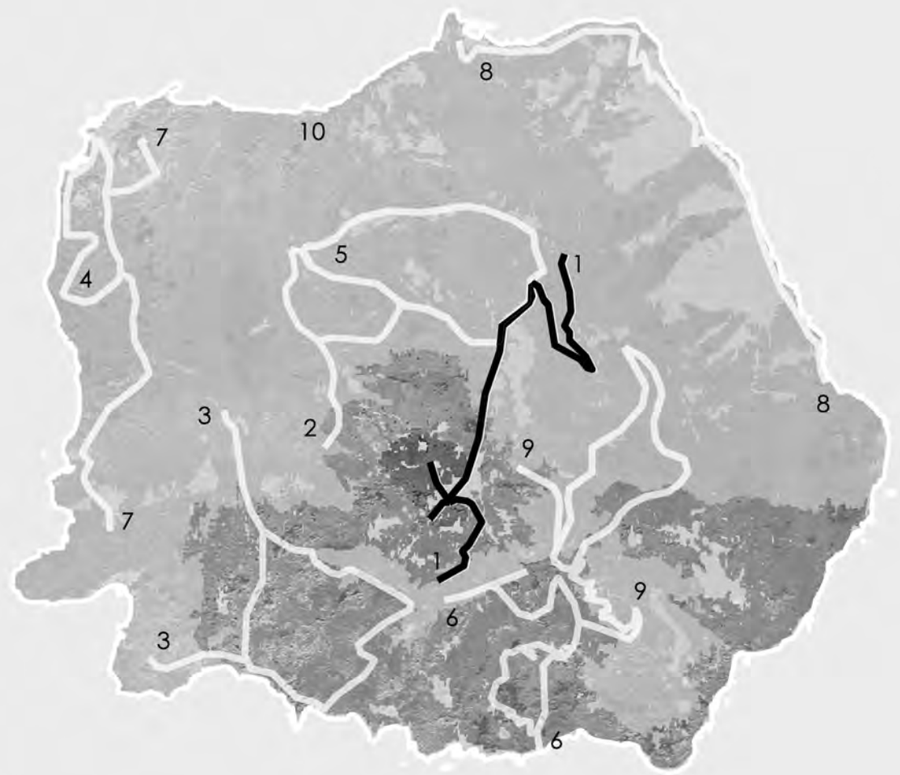
ΕΠΙΒΛΕΠΟΝΤΕΣ:
ΜΑΝΤΖΟΥ ΠΟΛΥΞΕΝΗ
ΓΙΟΥΖΕΠΑΣ ΔΗΜΗΤΡΗΣ
ΘΩΜΑΣ ΝΙΚΟΛΑΟΣ



Flow Evolution

Nisyros Volcano

A-D: Neotectonic Evolution
F1-F4: Rupture Zones



Geodetic Routes
Nisyros

Routes:
1: Καλδέρα - Λακκί
2: Διαβάτης - Νύφιος
3: Άργος
4: Χοχλάκοι - Κανόνι
5: Ευαγγελίστρια - Εμπορειό
6: Νικιά - Αυλάκι
7: Κάτερος
8: Πάλοι - Λιες
9: Νικιά – Φυλάκιο - Παρλέτια
10: Περίπλους

1:72,224
0 0.5 1 2 mi
0 0.75 1.5 3 km

The White Landscape
Γυαλί, Αύγουστος 2020

Lava Dome A
Pumice Mining
180 m

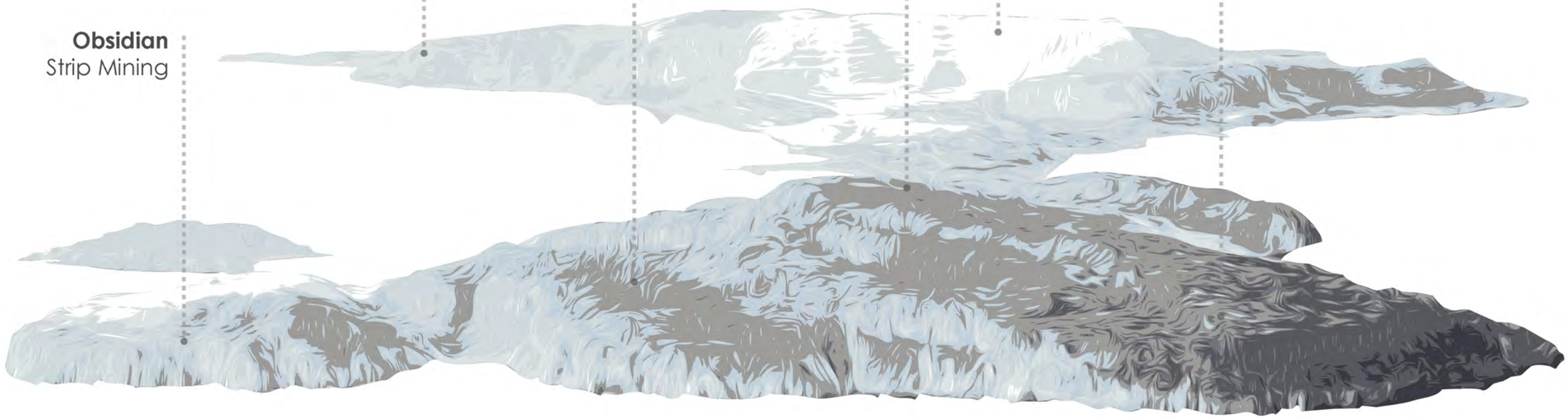
Forest
Scrubs and phrygana

Narrow Isthmus
Reef Sediment

Forest
Pinus brutia

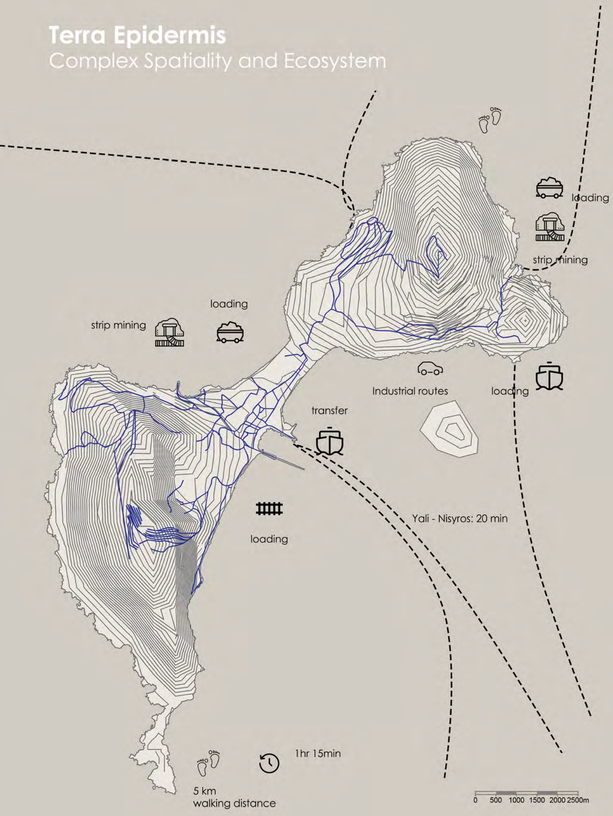
Lava Dome B
Obsidian
178 m

Obsidian
Strip Mining



Volcanic Complex
Intra Acting Agencies

Terra Epidermis
Complex Spatiality and Ecosystem



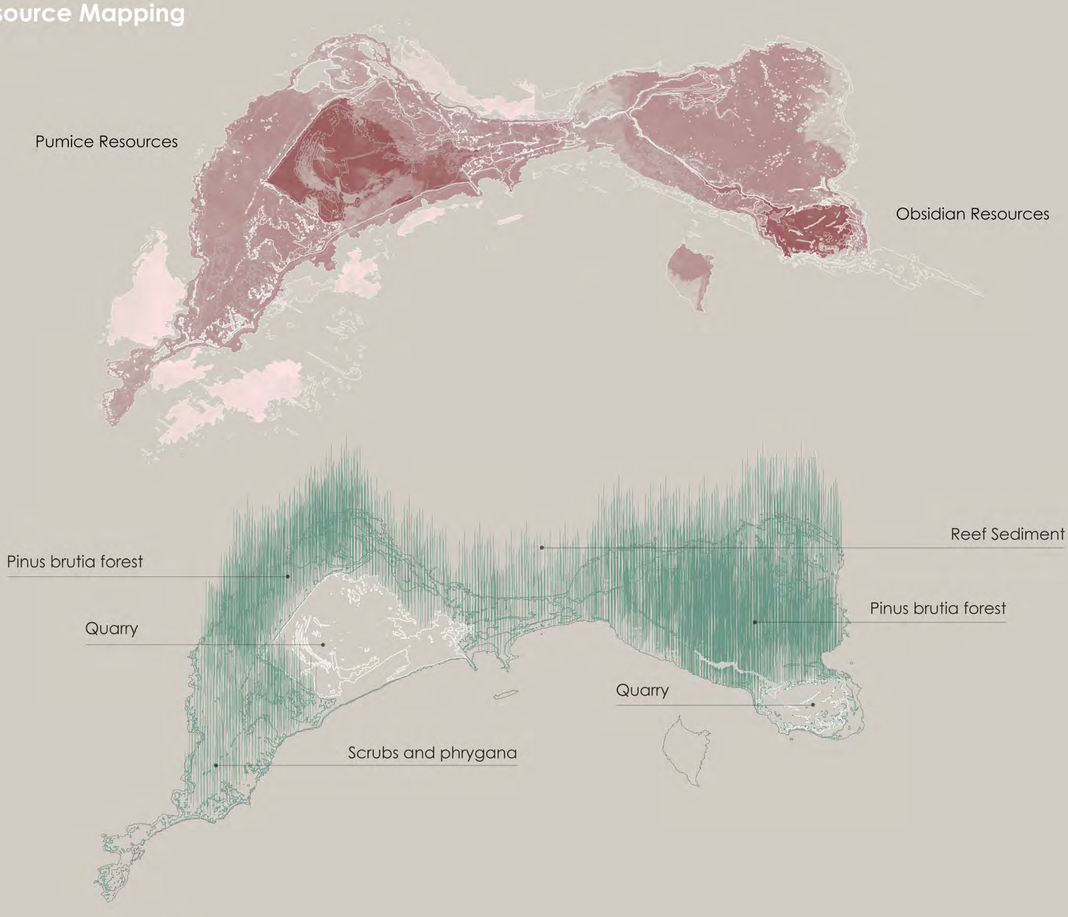
Ecosystem

Material Analysis
Gyali is located on the eastern edge of the Aegean volcanic arc and composed of volcanic rocks.
[i] The NE hill consists of **volcanic rocks** and **rhyolites** (perlite) with small, scattered concentrations of **glass** (obsidian), on its southern slope is a small patch of pumice. It is to the obsidian that the island owes its present name (in Greek, gyali means glass).
[ii] The SW hill consists of **aeolian**, intermediate and basic **pumice rocks**, suggesting a sedimentary pyroclastic **geological sequence**. Under the pumice are **clay**, **calcarenite** and fragments of various volcanic rocks (mainly pumice) cohesed with calcium carbonate.
[iii] The northern half of the east slope has a narrow coastal strip of loose sedimentary material (sand and pebbles), and the ridge connecting the two hills is of the same material.

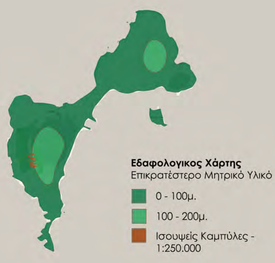
Flora
Gyali belongs to the group of small SE Aegean islands whose flora is not well known and has, in many cases, floristic peculiarities. The vascular flora of the island Gyali comprises 241 native taxa of vascular plants belonging to 55 families, 178 genera, 196 species and 45 subspecies. Four of the taxa are pteridophytes and 237 are spermatophytes

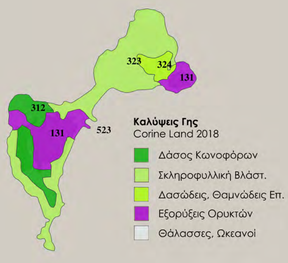
Vegetation
Four different vegetation formations, which are distinguished by vegetation structure and dominant species, characterize the island: a) Pinus brutia forests, b) scrubs and phrygana, c) psammophilous, and d) halophytic formations covering very restricted areas.

Resource Mapping



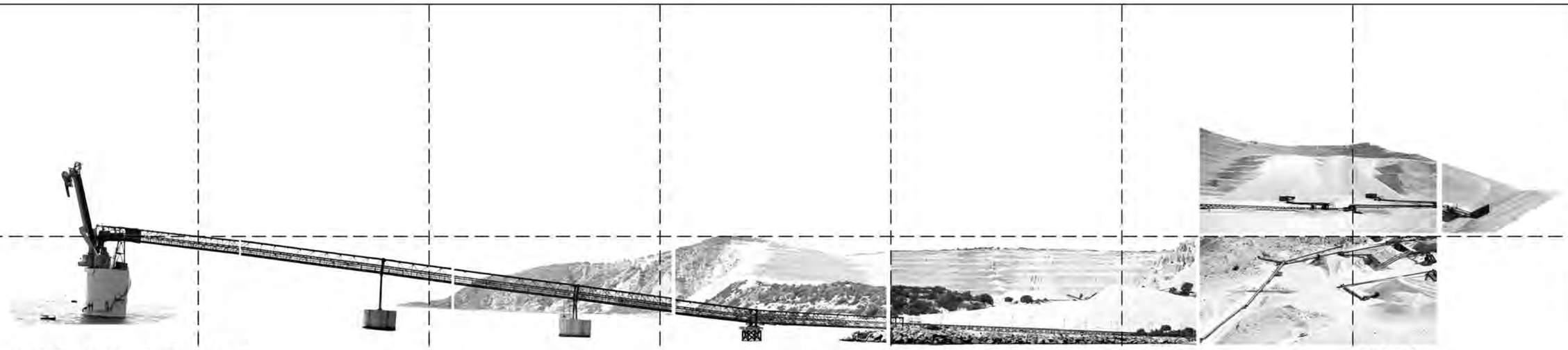
Land Use | Complex Spatiality





SACRIFICE ZONES

Pumice And Perlite Mining

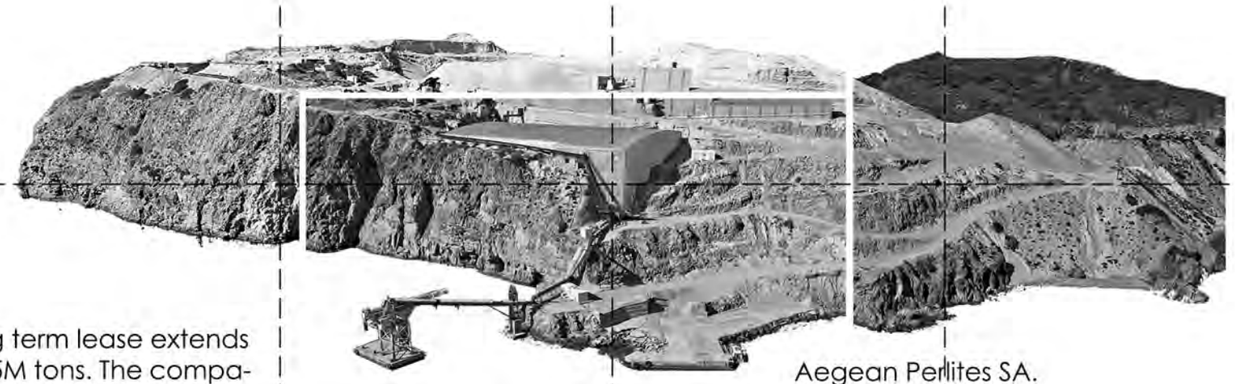


LAVA - Mining & Quarrying

3. Deposit
The final products (pumice of different granulometry) are deposited with conveyor belts in outdoor piles from where, again through artificial tunnels and conveyor belts, they are picked up and loaded on ships destined for customers.

2. Processing
The treatment consists of the granular gradation of the material in a circuit of static and vibrating sieves and the breaking of a small part in crushers.

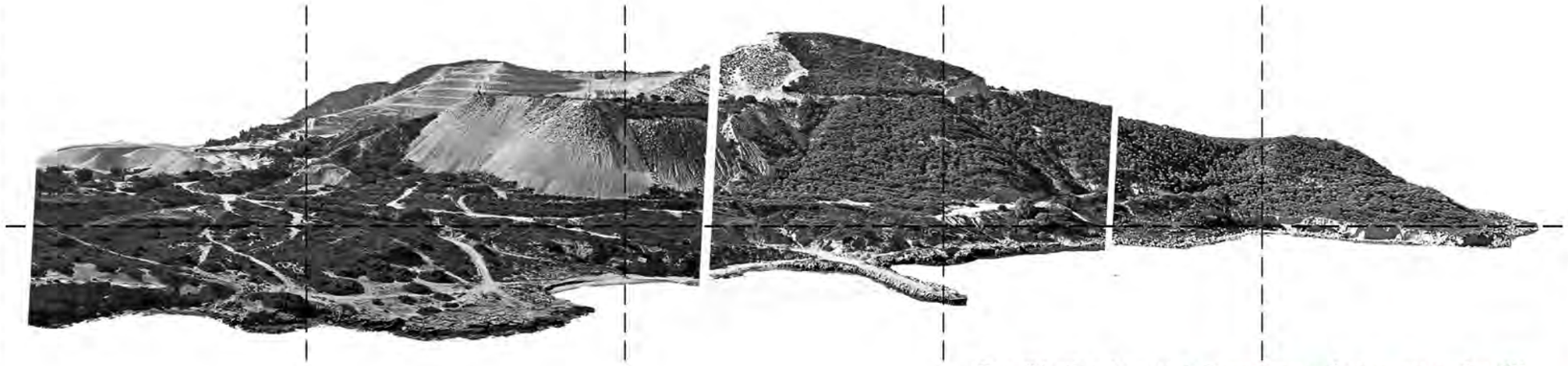
1. Mining
Initially, the deposit is discovered by the overlying barren geological formations (8-25m). The propellants are then mined and the extracted material is transported to the treatment plant via conveyor belts.



Aegean Perlites SA.

Stand-in Reserve

The surface leased, covers 428 acres, and the long term lease extends for several decades to come, which amounts to 75M tons. The company has secured rights for 11M tons. The company has a production capacity of 250,000 tons per year. These quantities correspond to, 1250 tons per day.



Gyali is the largest Greek pumice reservoir with over 120 million tons. **If mining continues, the deposit will be available beyond the year 2100.**

Leftovers

The production capacity of the mine reaches **1,000,000 tons / year**, while it has privately owned port loading facilities, with the ability to service ships with a capacity of up to 27,000 tons and a loading rate of **1,000 tons / hour**.



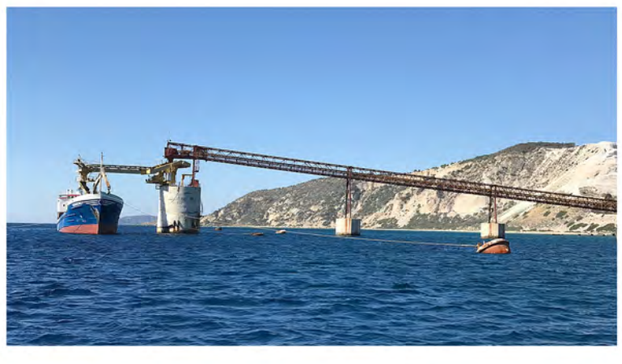
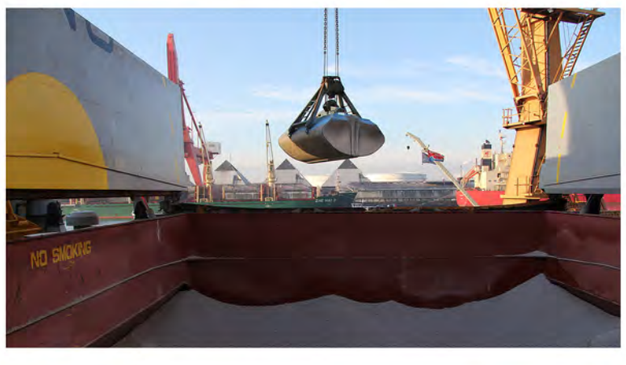


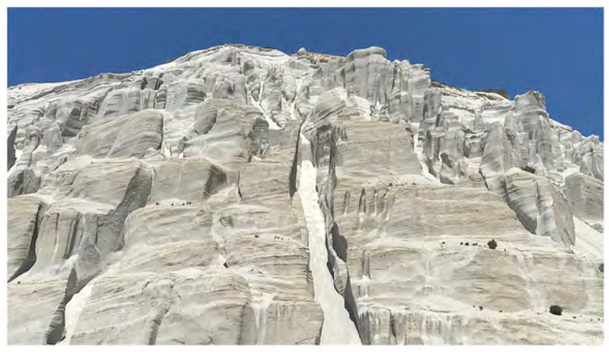




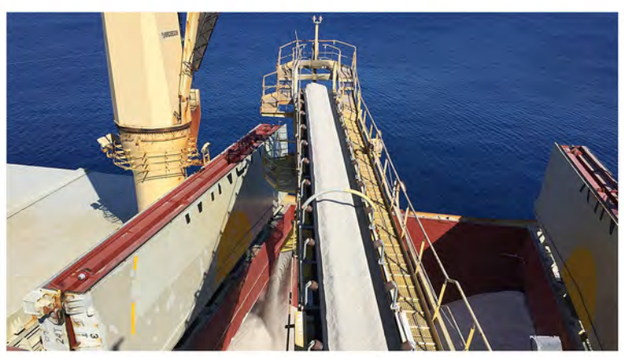




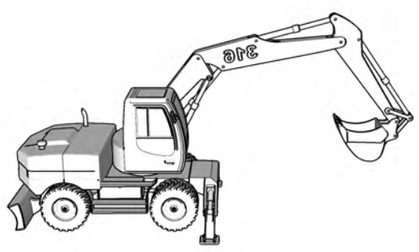



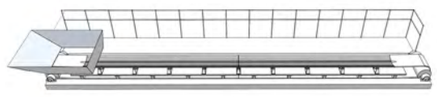


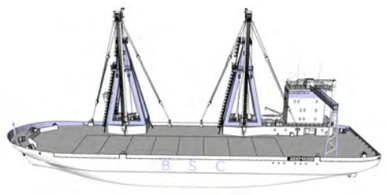


Mine



Loading



Unloading

Processing

1952

Foundation of the Company by ship-owner M. Nomikos

1962

The building infrastructure for pumice stone quarry was constructed, equipment was bought to transport and process pumice stone and a cable mine wagon system was installed to load vessels

1977

LAVA SA was integrated in HERACLES Group of Companies
A network of conveyor belts was installed to load vessels at a faster rate (1000tons/hour)

1980

LAVA SA extends to new activities and acquires Gypsum quarry at Altsi, Sitia, Crete

1988-89

New extraction methods are finalised for a) pumice stone using bulldozers and b) gypsum using vertical benches
Investments are made to renew and modernise mobile and fixed equipment in pumice stone and gypsum quarries, as well as to increase their production capacity

1990

Pumice stone Quarry's equipment is modernised and new building facilities are constructed
The company launches a co-operation with research and scientific institutions in Greece and abroad, concerning the development and utilisation of pumice stone qualities in new products and uses

1995

2000

The company is awarded ISO 9001:2008 certification for its pumice stone quarry
New infrastructures are built for gypsum quarry

2005

The company is awarded ISO 9001:2008 certification for its vessel-loading process in gypsum and pozzolana rock quarries

2011

Lafarge Beton takes over the activity of trading aggregates in Almyros Magnesia

Anthropocene Aesthetics

Strip Mining on Yali Island

DECLARATION

Anthropocene, the geological age of unprecedented domination of **man-made landscape**, necessitates our **reconsideration** of the human-nature dichotomy in the realm of built environment.

RECLAMATION

Through research it was made clear that the threshold of a **built object** is found to r**etain dynamic flow of nature**, transcend human-nature dichotomy and blur the boundaries between the technically artificial and the organically natural. Thus **Human can induce Nature**.

NATURAL PROCESS AS ARCHITECTURE

Architecture relies on a **double nature**, nature as standing **reserve**, as material to be exploited and rewritten, but also a nature that is always the super session and **transformation of limits** and thus beyond the passivity of the reserve or the resource, nature as becoming or **evolution**.

PURPOSE

The thesis will focus **past** the condition of these extreme environments/geographies as being altered by intense anthropocentric activity, such as energy harvesting and resource grabbing.

Post Anthropocene and Post Human, man enters into a relationship of resources as a collection of individual elements and processes.

Through **flow design** and **new materialisms**, the aim of the thesis will be to suggest new evolving patterns and alternative ways of being in the world, thus inhabiting places of transformation.

When the **flow stops**, the configuration becomes a flow fossil. This view challenges the entrenched line of thought that assigns humanity special standing in the natural world.

Humanity does not stand apart from nature everything on Earth is a manifestation of nature: nothing is "unnatural" or "artificial. "

FLOW FOSSIL

ABSTRACT FLOW | RE ANIMATE

are facilitating the real flow of the **human-and-machine species** on the landscape.

This does not mean that every change was an improvement but that, the changes that persisted were those that **facilitated flow access.**

Technology will continue to evolve toward greater efficiencies and **more power produced and used**, not less. The pursuit of higher efficiency will not lead to less fuel consumption. The **direction** has always been one-way: more power for more individuals over larger territories, and more power used by every individual.

Expendable places that can be forfeited for the sake of **sustaining** developed-world **lifestyles**

SACRIFICE ZONE

INTERACTIVE MATERIAL AGENCY

New Materialisms emphasize materiality as agential, stressing the **entaglements** and interactions between **humans** and the **nonhuman** world.

YALI

* anything that flows —which is just about everything is "alive" because it evolves as it flows

TABLE OF CONTENTS:

Strategic Planning

Post-Carbon Economy

Carbon Neutrality: achieving net zero carbon dioxide emissions

[1] balancing carbon dioxide emissions with carbon offsets > **carbon offsetting**

[2] reducing carbon emissions (low-carbon economy) to zero through changing **energy sources** and **industry processes**

> shifting towards **renewable energy** > reductions of carbon dioxide emissions

**renewable and non-renewable energy both produce carbon emissions, renewable energy has a lesser to almost zero carbon emissions which produces less carbon emissions compared to fossil fuels.*

Transition to Carbon Neutrality

Reduction

Offsetting

Evaluation and Repeating

Decarbonisation activity by sector

Action Points:

> Design actions to mitigate and **adapt** to climate change and build resilience at **local level.**
> Trigger the uptake of smart technologies to ensure the **optimal management and use** of our resources and infrastructures.
> Move away from fossil fuels by tapping our significant **renewables and energy efficiency** potential.
> Introduce **sustainable island mobility** (including electric mobility).
> Reduce **water** scarcity by applying non-conventional and smart water resources management.
> Become **zero-waste** territories by moving to a circular economy.
> Preserve the distinctive **natural and cultural** capital
> Diversify local **economies** by exploiting the intrinsic characteristics of the islands to create new and innovative jobs locally.
> Strengthen social inclusion , **education** and citizens' awareness.
> Encourage the shift towards alternative, yearlong, sustainable and responsible **tourism** .

Offshore Wind Energy (OWE)

Salinity Gradient Converters (SGC)

Sea Water Air Conditioning (SWAC)

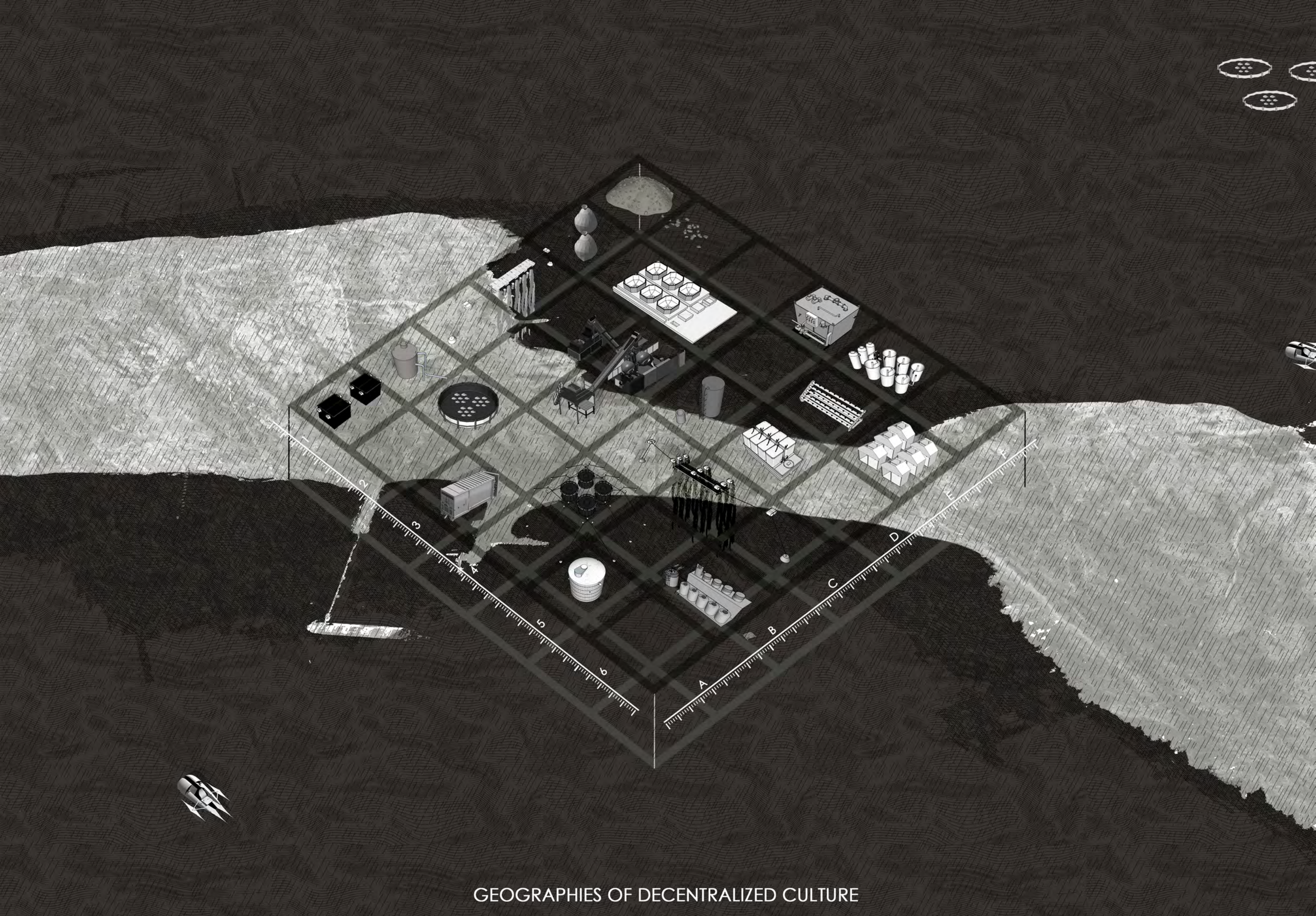
Wave Energy (WE)

Tidal Energy (TE)

Wave Energy (WE)

Geothermal Energy

POST CARBON GEOGRAPHIES



GEOGRAPHIES OF DECENTRALIZED CULTURE

Bio-Rock

Micro-organisms

Sponge

Obsidian

Pumice

Biotechnology

Data Collection

Material Agencies

Feedback Loop

Transport Management
& Information Systems

Maritime Surveillance

Eco Management Systems

DATA ARCHIPELAGOS

Tourism | Strategic Planning

Νίσυρος

Παχειά

Περγούσα

Ανοίκειος < στερ. αν- + οικείος < οίκος= σπίτι
Uncanny [ken= κατανόηση, συνείδηση] = κάτι που είναι έξω από τις οικείες αντιλήψεις καιπεποιθήσεις κάποιου

ανοίκειο /uncanny | inhabit places of transformation

Uncanny Landscape

Γυαλί | ποιείν (κατοικούμε όσο παρεμβαίνουμε με το να χτίσουμε)

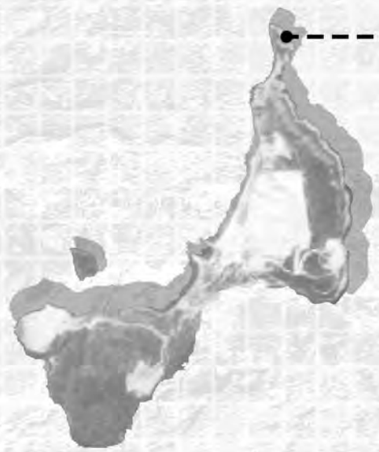
[Immersive] Experience

καλύβα | αντίσκηνο (δεν είναι κατοικία)

Γυαλί > Immersive Experience > Interactive Material Agency

Strategy Analysis:

- Issues of **identity**, governance, **co-evolution of activities**, **consumption patterns**, use of data, underwater heritage >> Alternative tourist strategies to enhance the local sustainable development of tourism by promoting local and mediterranean identity.
- Enable the **coevolution** of **human activities** and **natural systems** for the development of sustainable coastal and maritime tourism.
- **Ecotourism** destination support systems: planning, monitoring, management & promotion. Create sustainable governance for the protected areas.
- Coastal areas > sustainable **tourism water management**.
- **Unique geo-characteristics** as coastal destinations.
- Education and Awareness for **'ethos'** cultivation



Γυαλί

Στρογγύλη

Aquaculture

Aegean
Waste Streams

Στρογγυλή
▼ 36.680588 , 27.176940

Transitional Environments:
Cabinet of Curiosities

Γυαλί
▼ 36.664824 , 27.119262

Territorial Archives: Inhabiting Lost Volumes

Ocean Farming

Νίσυρος
▼ 36.611448 , 27.035920

Πέργουσα
▼ 36.587950 , 27.035920

Living Archipelago: Manual in Progress

Παχειά
▼ 36.569754 , 27.071711

Masterplan

Territorial Archives: Inhabiting Lost Volumes

[A] In the beginning, this project examines the **spatial long span** of Yali's **materiality** and its **relation to** the **landscape**. From the very **mining** and **extraction** of raw materials on Yali island, to its processing, transportation and utter use as construction material. The **materials become finished effects** and purposes, later on to be demolished, become waste and decompose. The spatial and temporal span of the island's **materiality is very geographical** and geological.

[B] While this island has inherited its material aspects as a volcano legacy and was located naturally, its **constant extraction** and looming **material depletion**, allocates these properties all over the world thus rendering this material agency material-less. Seeing **extraction as an architectural tool**, this project proposes **territorial transformation** in **response to** the economic, social, energy and political demands while providing stabilities to this fluidity. With the dynamic process of mining and extraction and the process of re[allocation + use] that relies on a "functional lifespan", the **landscape** is expected to **constantly rethink, repurpose and reinvent itself.**

The project proposes a set of stabilities in the form of:
[1] Voids / Monuments and **[2] Huts**.

[1] While the excess resource mining creates irreversible impact, **permanent voids of space once claimed**, occupied, harnessed, eventually emptied now questioned, **transform from volumes to monuments of volumes that have now migrated**. Each of them accommodating the negative space of the one that was, for a **land that is in constant transformation and de-construction**.

[2] In contrast to this spatial preservation, the idea of **"Huts"** introduces the idea of **"interactive material agencies"**. This posits the idea that every structure has an inherent lifespan based on the program it houses rather than its preserve-worthy physical condition. But also, **new materialisms** enable **entanglements with nonhuman agencies** thus laying the ground for hybrid geographies of the post- and inhabiting places of transformation.

Reciprocal Landscapes | A story of Material Movement

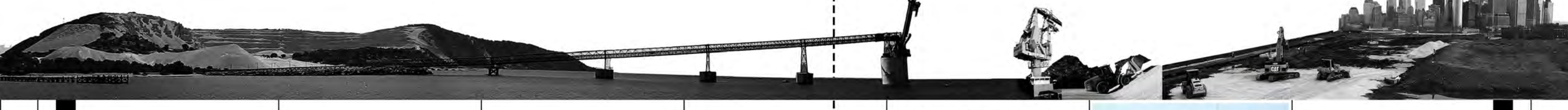
How are the far-away, invisible landscapes where materials come from related to the highly visible, urban landscapes where those same materials are installed?

Material Network

45°24′N 75°40′W
40°43′N 74°00′W
38°53′N 77°01′W
36°46′ N, 3°03′ E
53°25′N 8°0′W
51°30′N 0°7′W
40°26′N 3°42′W
48°51′N 2°21′E
50°51′N 4°21′E
52°22′N 4°53′E
52°31′N 13°23′E
44°25′N 26°06′E
35°54′N 14°31′E
41°1′N 28°57′E
39°N 35°E
35°10′N 33°22′E
33°54′N 35°32′E
31°47′N 35°13′E
31°57′N 35°56′E
29°22′N 47°58′E
26°13′N 50°35′E
25°18′N 51°31′E
24°28′N 54°22′E

geological deposit

finished product



Geotechnical uses
As a lightweight filling material (substrate in loose soil)
Road construction, port projects, airport projects, playing fields

Building applications:
- Production of lightweight structural elements (pumice concrete blocks)
- Production of lightweight concrete
- Insulations and floor fillings

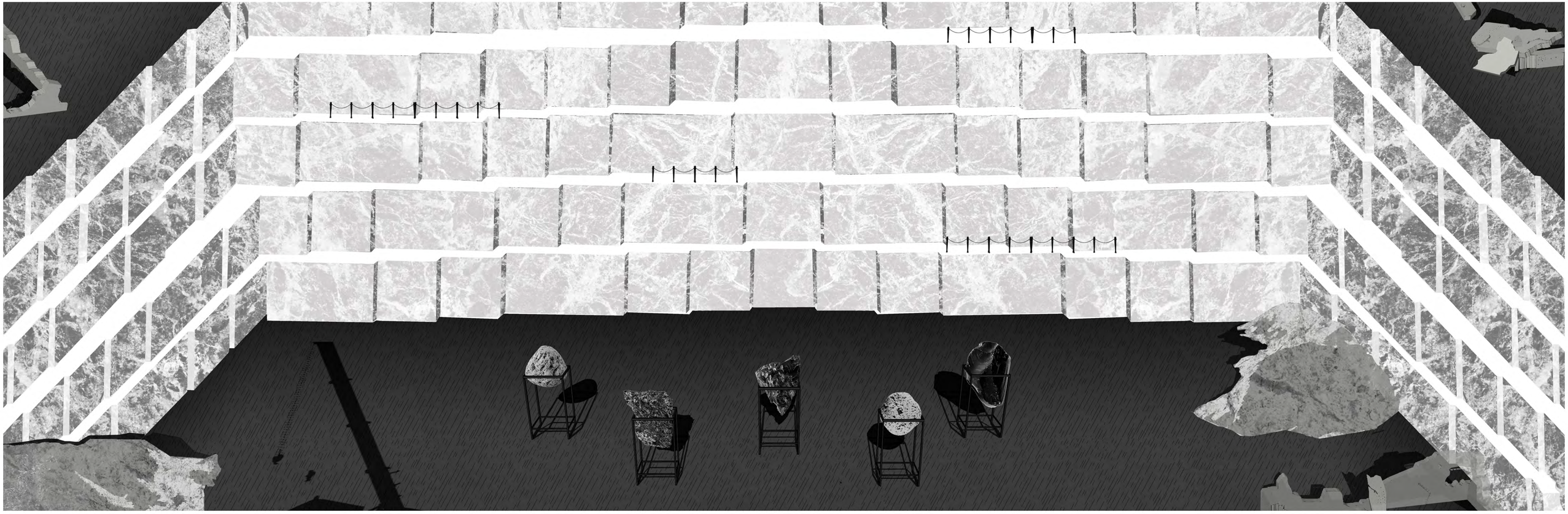
Manufacturers of construction materials, from lumber to metals to concrete, are among the world's largest corporations and offer an unlimited banquet of options, **detached from locality.** While **construction materials may appear to be fixed commod ties, they are anything but fixed in time, space, or form.**

Materials **change shape** as they **travel from geological deposit** or forest to factory and design project to land-fill, passing through human hands and tools.

Reciprocal Landscapes such as Yali, pose questions about the **social, political, and ecological entanglements of material prac tice** challenging to think of materials **not as inert products** but as **continuous with land** and the people that shape them, and to reimagine forms of **construction in solidarity** with people, other species, and landscapes elsewhere.

Agricultural uses:
- Soilless horticulture
- Green Roofs
- Soil improvement
- Ingredient for mixtures and soils for cultivations
- Improvement and drainage of lawns
- Soil coverage
- Urban vegetable production

Taken together, patterns of labor injustice and resistance, the re moteness of production sites, and cycles of exhaustion related to material production illustrate Jason E. Moore's notion of how capi talism organizes **"cheap natures,"** rather than a more palatable story of modern progress. The textures, smells, structures of particu lar materials give people tactile and **intimate contact with frag ments of distant landscapes** and their **myriad social and ecologi cal relationships**.



Monuments of Lost Volumes

The excess resource mining creates irreversible impact, permanent voids of space once claimed, occupied, harnessed, eventually emptied now questioned, transform from volumes to monuments of volumes that have now migrated. Each of them accommodating the negative space of the one that was, for a land that is in constant transformation and de-construction.

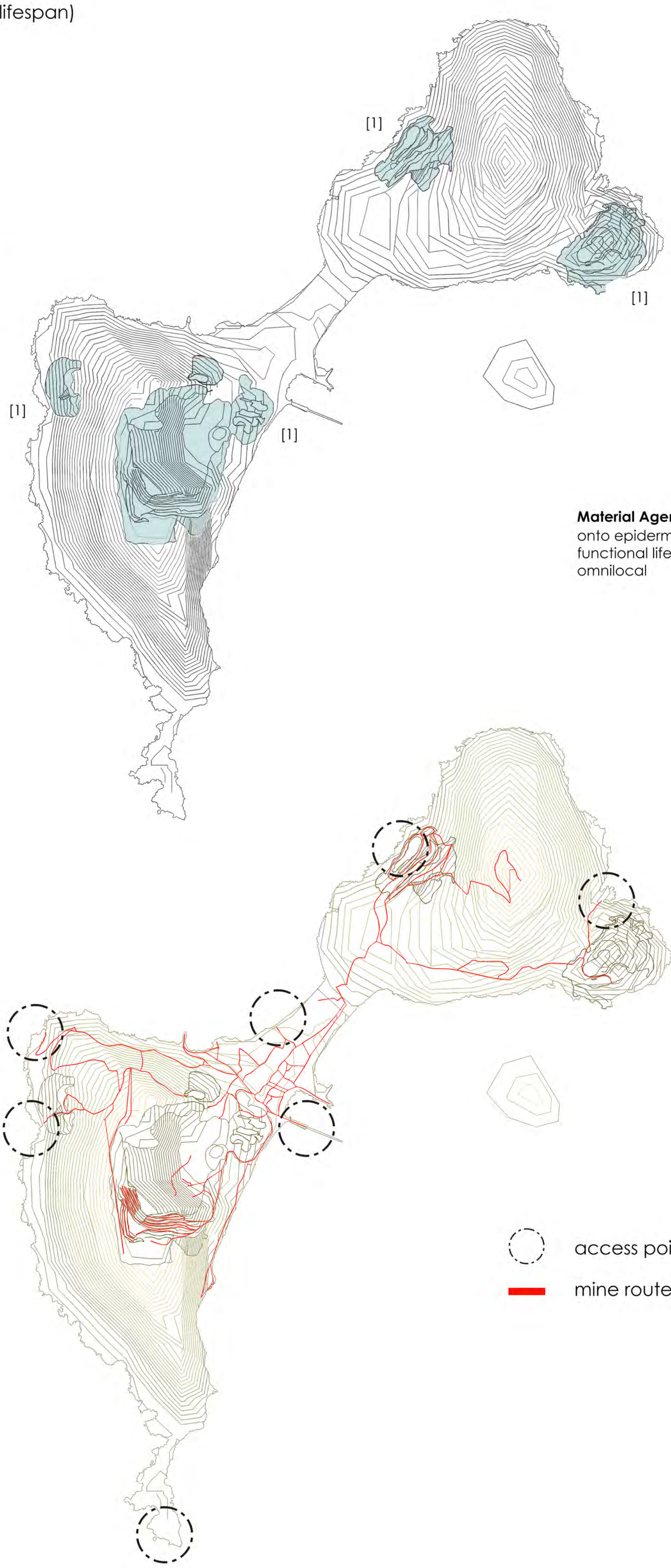
TERRITORIAL ARCHIVES
INHABITING LOST VOLUMES

[1] Monuments: permanent voids
volumes lost to other geographies

[2] Huts: material agencies
(functional lifespan)

- Obsidian Labs
- Pumice Huts
- Marine Huts
- Open Air Shelters

[3] Territorial Walks / Mine Exploration
(adventure tourism)

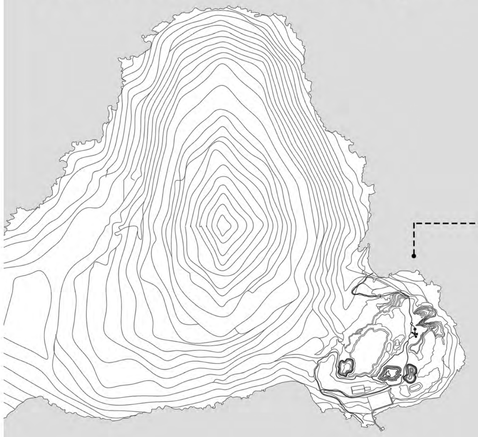


Material Agencies
onto epidermis
functional life span
omnilocal

access point by sea

mine routes

Obsidian Labs | Interactive Material Agencies



36.662°N 27.115°E

Water Scarcity Management
(Rainwater Collection)

Metal Cladding
(Cooling the building)

Circular Economy
Assemble - Disassemble Parts
of the Building

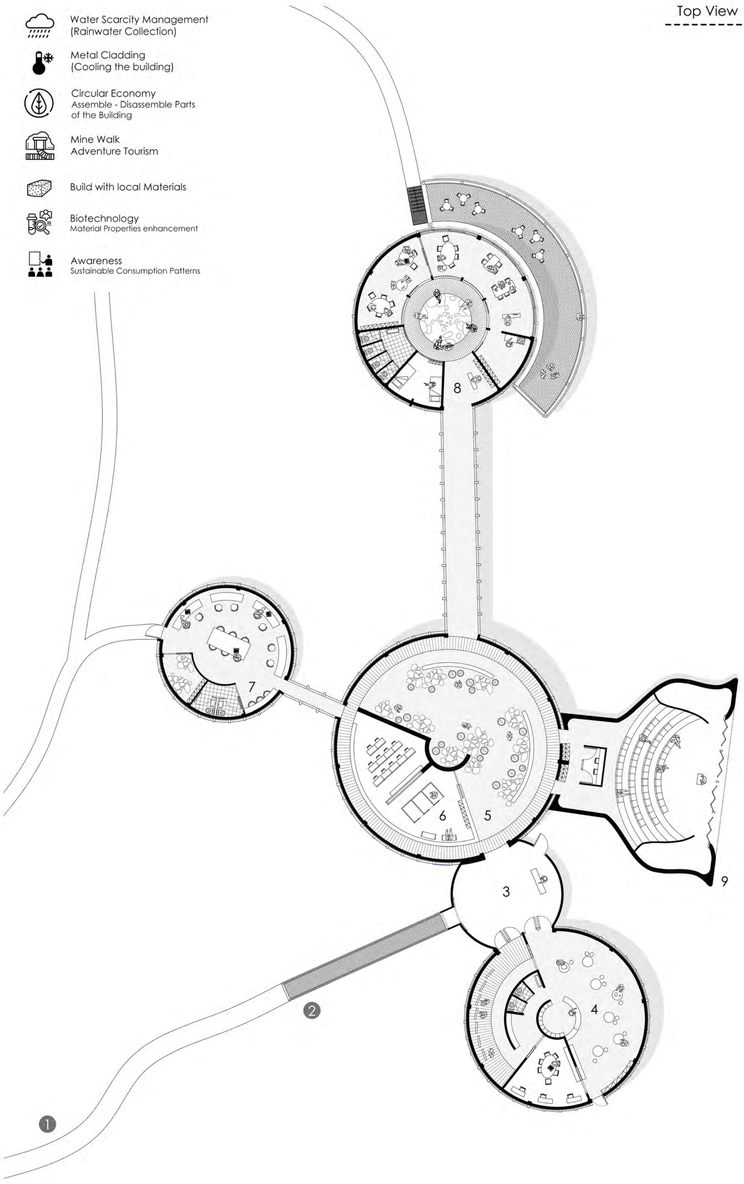
Mine Walk
Adventure Tourism

Build with local Materials

Biotechnology
Material Properties enhancement

Awareness
Sustainable Consumption Patterns

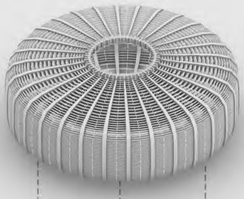
Top View



Program Description:

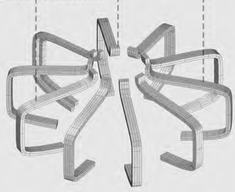
1. Mine Exploration Path
2. Geological Trail (Arrival)
3. Reception Area
4. Obsidian Labs
5. Exhibition Space
6. Facilities
7. Reanimation Lab
8. Facilities
9. Immersive Theatre
10. Water Cistern (Rainwater Collection)

[i] Metal Cladding
(Rainwater Collection Cladding)

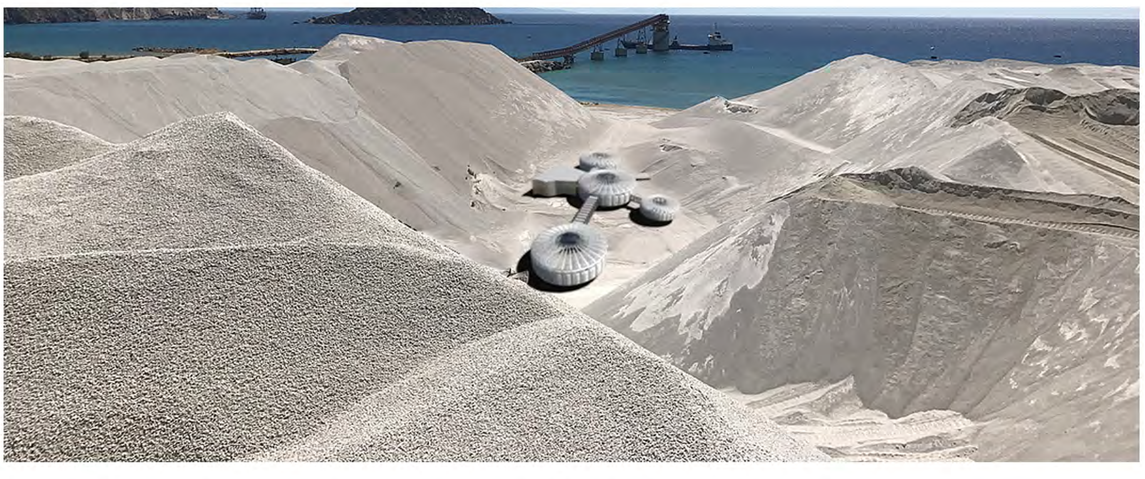


[ii] Pumice Shell

[iii] Pumice Columns



Grasshopper Sequence

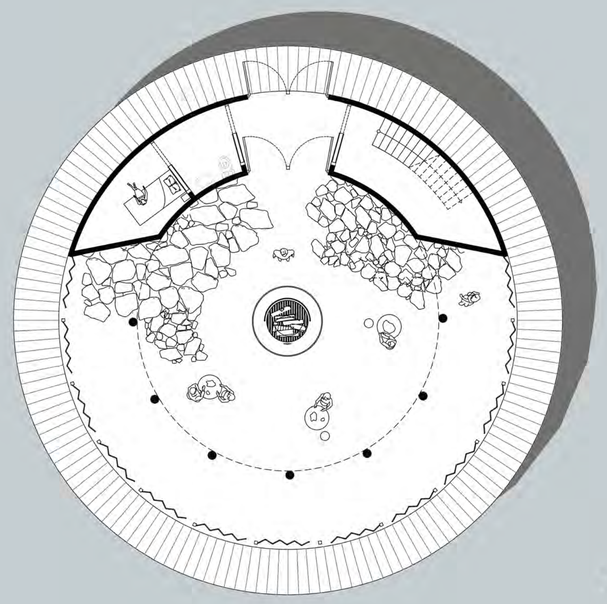


Pumice Huts | Material Agency

Building Local

Circular Economy

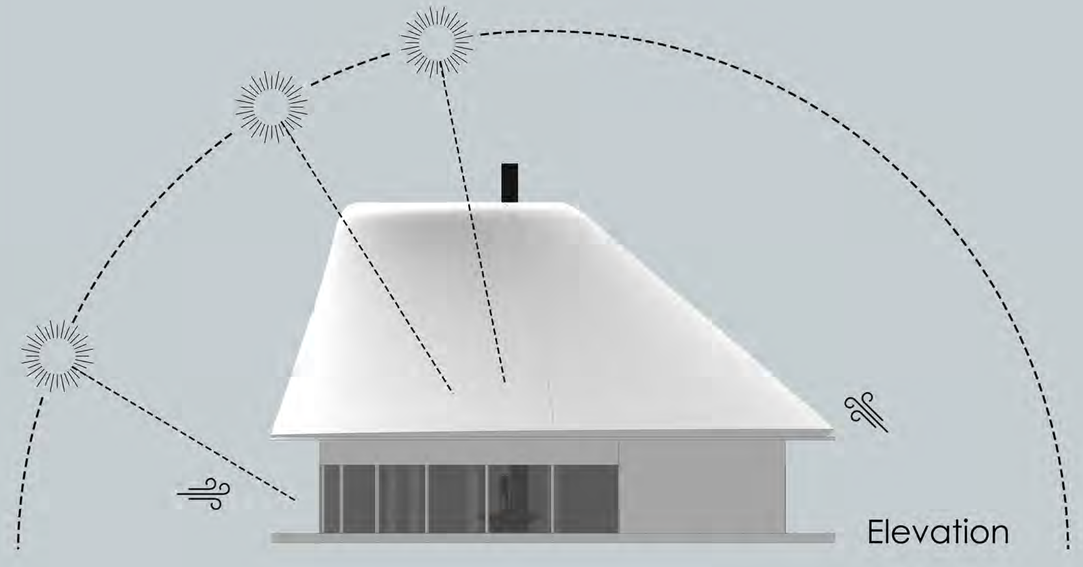
Leave no Trace



Section

Top View

Spiritual Tourism
Meditation through building with pumice



Elevation

Building with Pumice

ERUPTION

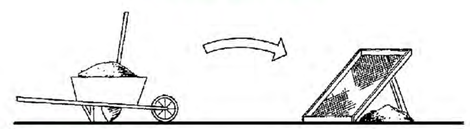
EXTRACTION

TRANSPORTATION

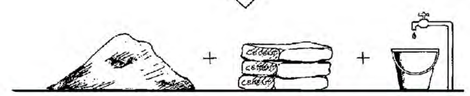
Pumice is a very porous form of vitrified volcanic rock, usually of very light colon. It is very light and has roughly the consistency of a mixture of gravel and sand, with light, porous individual granules that normally either float on water or sink only slowly. Pumice particles are either round or angular and measure up to 65 mm in diameter. Only particles in the 1 -16-mm size range should be used to obtain good building material.

Pumice originates during volcanic eruptions, when molten endogenous rock is mixed with gases before being spewed out. The light, spongy particles are hurled up and carried off by the wind. As they cool and fall back to Earth, the particles accumulate to form pumice rock or boulders.The size of pumice particles ranges from superfine powder (0-2 mm) to sand (2-8 mm) to gravel (8-65 mm). The particle porosity can reach 85%, meaning that 85% of the total volume consists of "air" and only 15% of solid material.

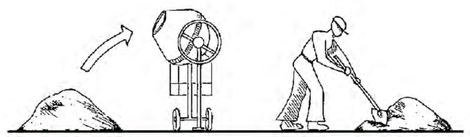
Pumice has **excellent properties**. As a building material it is:



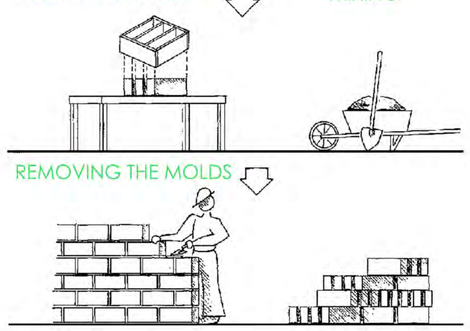
SCREENING



PUMICE CONCRETE WATER

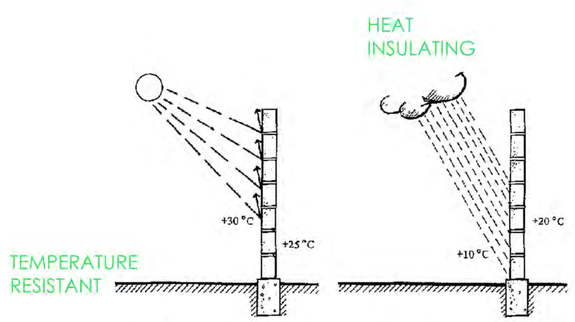


PUMICE CONCRETE MIXING



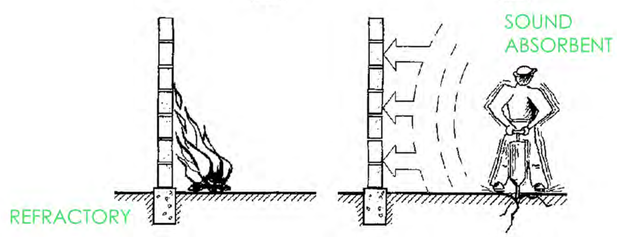
REMOVING THE MOLDS

USING THE DRIED BLOCKS



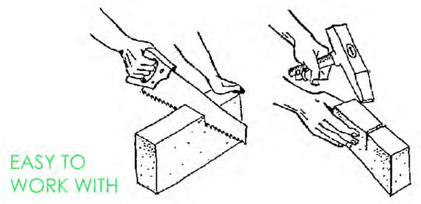
HEAT INSULATING

TEMPERATURE RESISTANT



SOUND ABSORBENT

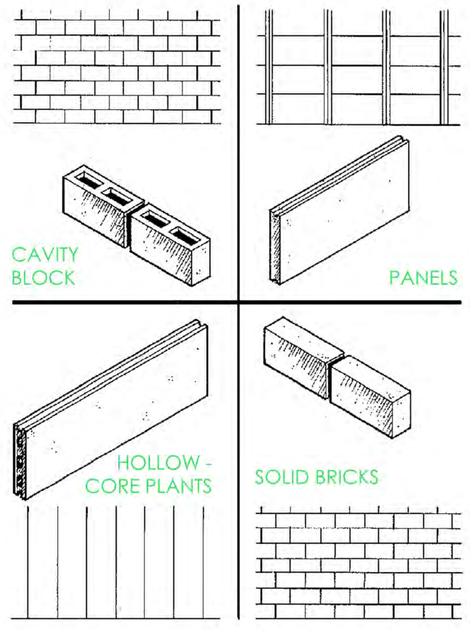
REFRACTORY



EASY TO WORK WITH

But it also has some **negative properties** like:
- the lower compressive strength of pumice concrete, as compared to concrete containing other, heavier aggregates
- the tendency of its edges and corners to break off more easily than those of heavy concrete
- its lack of frost resistance when wet

Consequently, pumice building material should not be used for:
- foundations
- components with constant exposure to water, e.g. in showers
- components subject to heavy traffic, e.g. stair treads and floor tiles.



CAVITY BLOCK

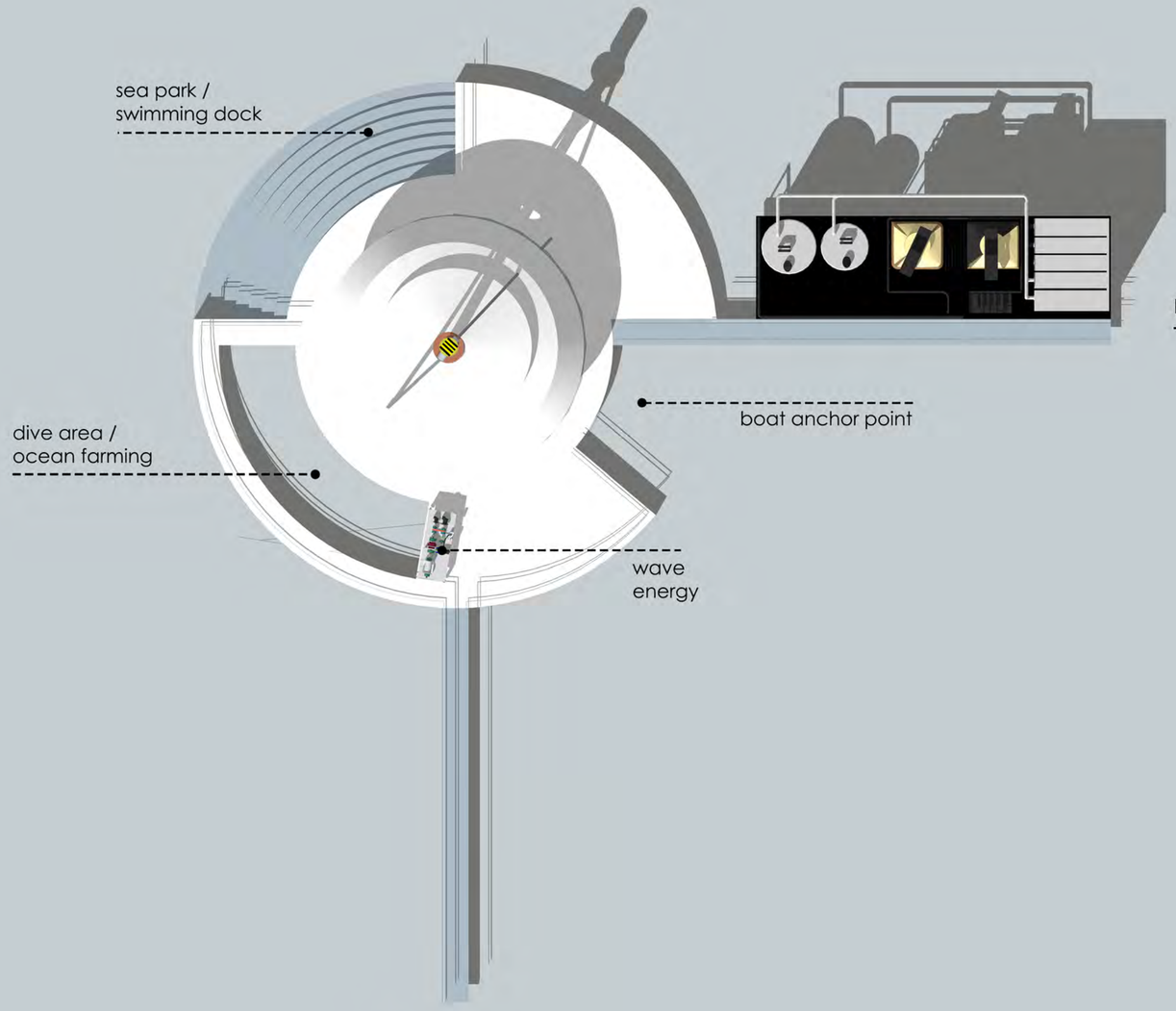
PANELS

HOLLOW - CORE PLANTS

SOLID BRICKS

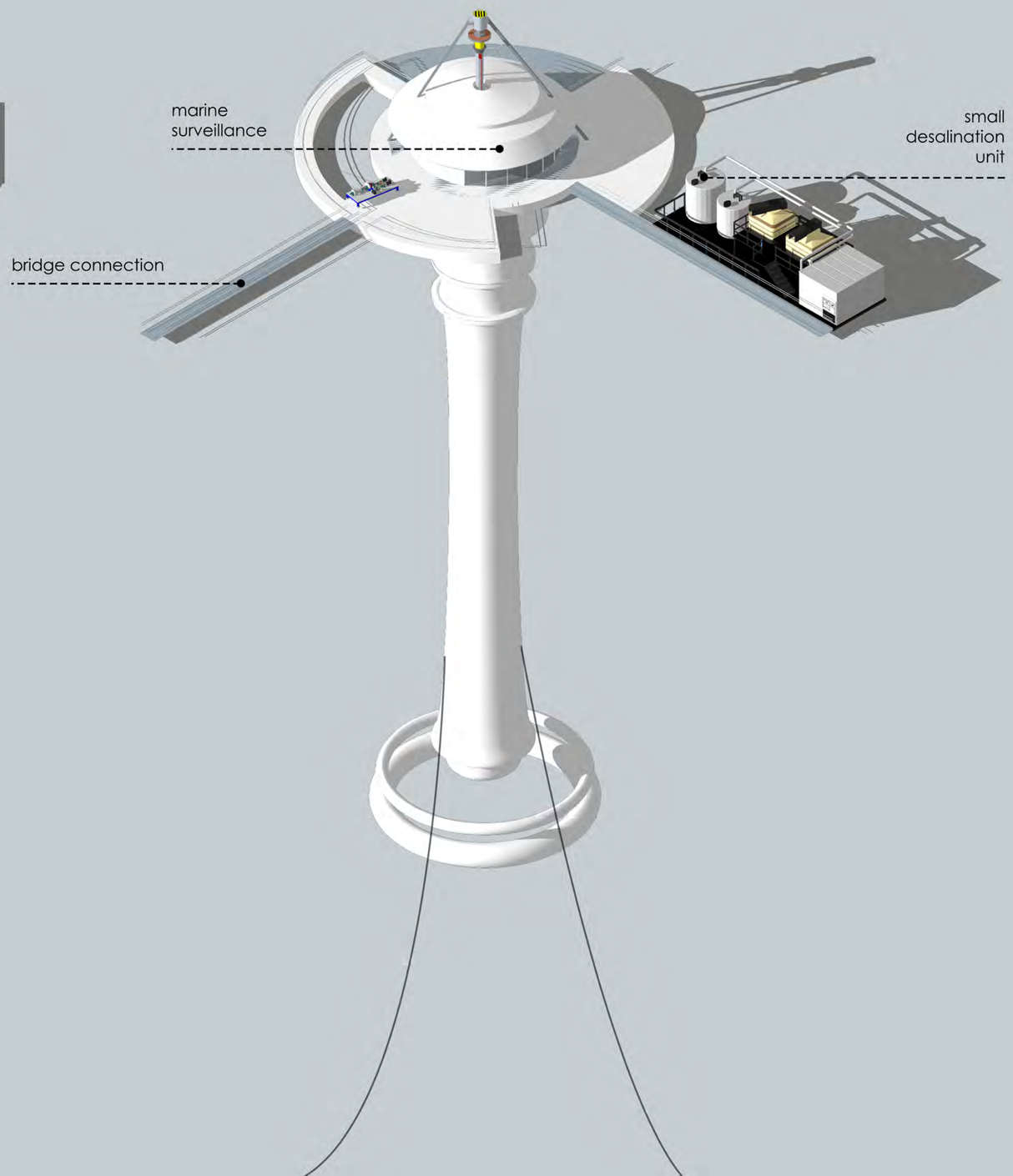
Marine Huts | Ocean Farming

Marine Huts | Ocean Farming



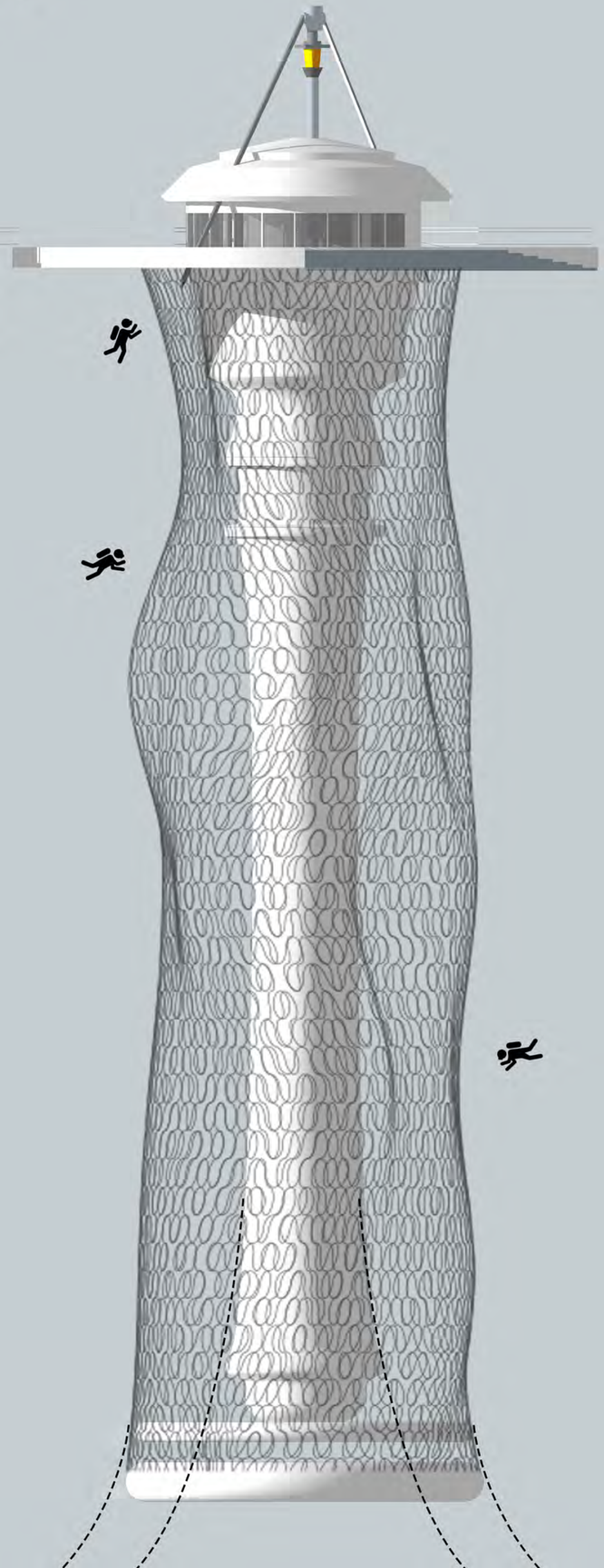
Top View

Perspective



Marine Huts | Ocean Farming

Ocean Thermal Energy Converter (OTEC): a marine renewable energy technology that harnesses the solar energy absorbed by the oceans to generate electric power.



Electricity

Fresh Water

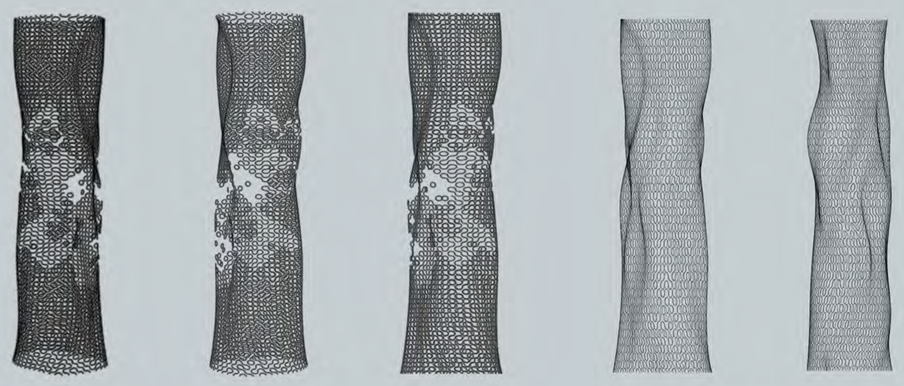
SWAC

Mari Culture

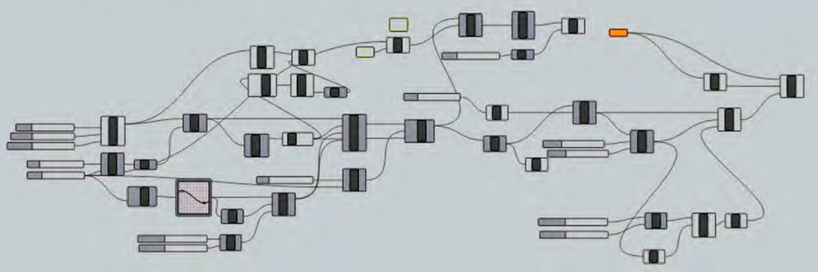
Biorock Analysis

Biorock is a unique ocean technology that produces the only **marine construction material** that **grows**, heals itself, and becomes stronger with age. Biorock applies safe extremely low voltage direct current trickle **charge to steel structures of any size** or shape. Biorock rapidly **regenerates** coral reefs, oysters, sea grasses, salt marshes, mangroves, fisheries, and coastal ecosystems where there is no natural recovery. It greatly increases settlement, growth, survival, and resistance to extreme high temperatures and pollution stress for corals and all marine organisms. Coral reefs made of biorock survive severe bleaching events, and rapidly regenerate reefs and fisheries. Floating Biorock reefs **filter** and **clean polluted coastal waters** endagered by humans.

Biorock | Growth Simulation



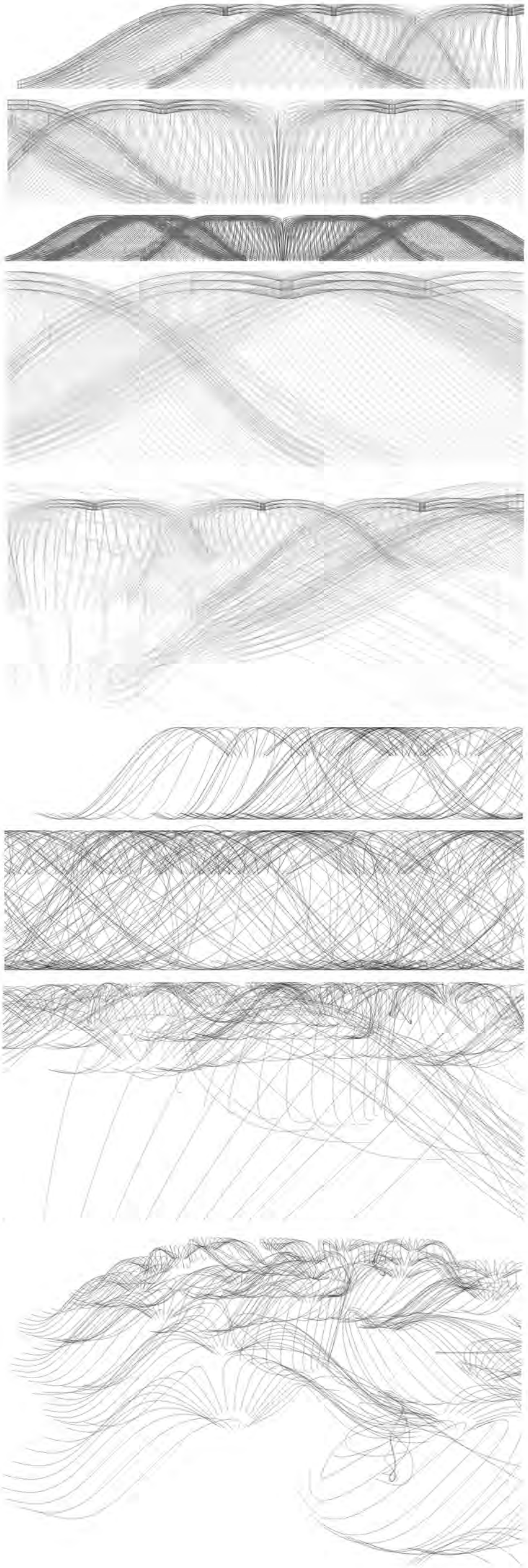
Grasshopper Sequence

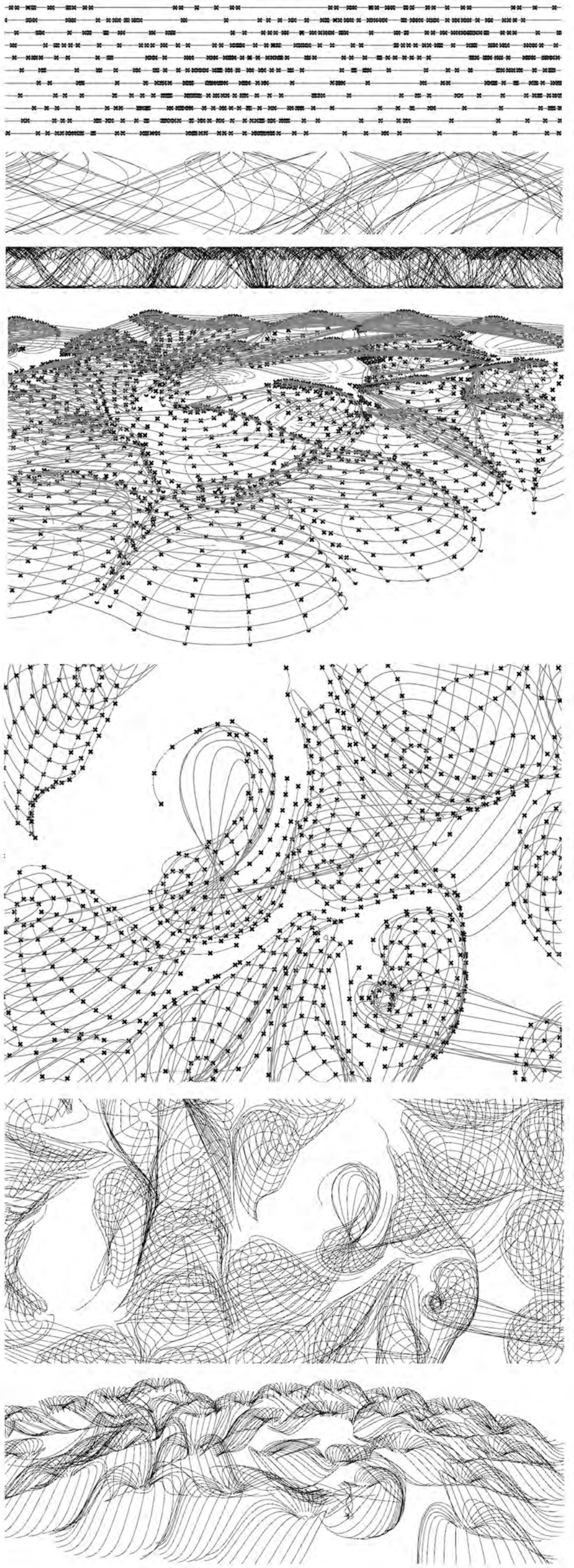


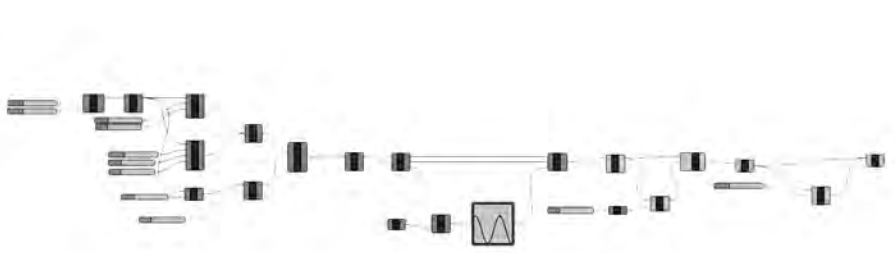
Open Air Shelters | Spiritual Hut

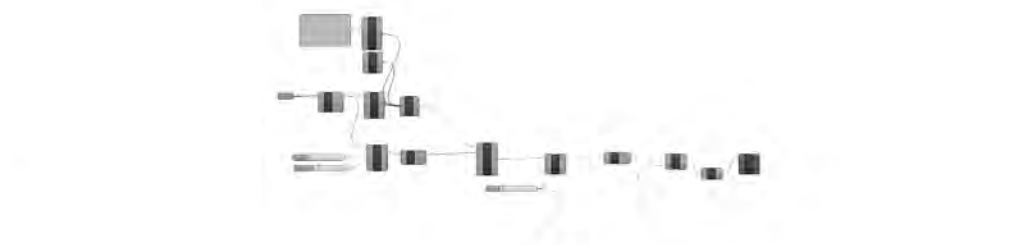
dune formations x performance

Open Air Shelters | Spiritual Huts









Thank you