AHAMTOULI

CONCEPTUAL DESIGN

CORFU ISLAND, GREECE 2017

Terra Phoenix design

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AHAMTOULI

Terra Phoenix Design

TABLE OF CONTENTS

INTRODUCTION

Introduction

Welcome to the Ahamtouli Master Plan. This report should be considered a “living document,” thus subject to change. That is the nature of gaining experience and responding to feedback. However, following this design as a guide will help to avoid the kind of mistakes that cannot be fixed, the kind that can doom a project to failure, while guiding you toward success.

The document is organized into four basic sections. Vision presents Ahamtouli’s vision for what this project will be. Assessment looks at the biological, physical, and community context that characterizes the chosen site. Conceptual Design presents Terra Phoenix’s recommendations on placement of elements on the land and further information on how to deal with challenges and take advantage of opportunities. Implementation provides practical steps to actually turn this conceptual design package into a living, breathing place.

In addition, there is an appendix that provides an extensive species list, soil test results, and other pertinent details.

With the completion of this document, our team looks forward to the creation of an inspiring model of sustainability on the island of Corfu.

Mission

Ahamtouli is a home, retreat, learning center, and sacred space on the island of Corfu, Greece that provides inspirational accommodation for a wide range of visitors while enhancing local ecology, supporting local economy, and rejuvenating the spirits of all who are involved. This mission extends well into the future and serves as a legacy for all who wish to live in harmony with Nature.

Vision

Ahamtouli was born of the desire to give back the gift given from this beautiful planet to us. It is a sacred space where people can connect to each other and Nature. It brings together the very best of what is authentic and native in Greek, Corfiot culture, cuisine and music and marries that with travelers who come bearing gifts of eco-technologies, artistry, meditation techniques, dance inquires, film, music, the arts. Ahamtouli is a living school where artists, scientists, lovers, and poets realize they too are farmers, cooks, caretakers and that the inverse is also true. At Ahamtouli the land, and the people, plants, and animals on it live in a conscious web of life force energy, nothing takes without giving back, a flow of loving exchange that supports all life.

This project has the ability to make broad changes in how people interact on planet earth. Ahamtouli will show how people can directly make projects happen that reflect their values. It will also allow many people to learn valuable lessons about grassroots values, ecological living, and resourcefulness. Everyone who comes to Ahamtouli will have the opportunity to learn and appreciate the practical, hands-on skills that are necessary for a sustainable future.

Imagine yourself arriving at Ahamtouli, whether family, friend, or unknown visitor. You are greeted by friendly people eager to get to know you. You whisk through colorful gardens a buzz with the sound of beneficial insects on your way to your lodging. After settling in perhaps you explore the grounds and find a blend of fragrant flowers and tasty snack fruits abound. Wandering a bit further you stroll through well-tended, ancient olive groves, productive vegetable terraces, and groves of chestnut and oak. Throughout you encounter birds and other wildlife and get the sense you are in a sacred sanctuary. You come upon some young people who are there to learn, grow, and cultivate. Together you share interesting perspectives with one another, and everyone has more wisdom for the encounter.

That evening you take a solar-heated shower and join other guests for a delicious meal of homegrown, organic food lovingly prepared by a local chef. You can feel to sacredness of the place sinking into your bones. After dinner you explore closer to home and discover fascinating educational features on the site explaining everything from where the electricity comes from to how human waste gets turned from a pollutant into fertility enhancer. When you settle in for a good night’s sleep, you have a lot to ponder and, perhaps, you’ve experienced something that will stay with you long after you’ve left Ahamtouli.

INSPIRATION

Ahamtouli

Round tents on terraces
Living lightly on the earth
Not timidly, but with a bold dream
Bigger than we knew
was within us
The big dream life is
urging through us

Ahamtouli is a universe
in a small village
A place where soul pilgrims
come from around the world
To look each other in the eye
To drop the mask and armor
To touch the beating
heart of humanity
The healing of coming home
to what we know is possible
but is hidden within the
folds of our fears

The flowing terraces invite
the flow of the soul
Snaking around and through
the land, through the spirit.
The expansive view expands
heart, mind, body
to the intimacy of flitting butter-
flies and eternal stones.

The infinite weaving of
meadow insects, herbs,
birdsong, light and shadow
is braided into the infinite
opening of the sky
making a unique paradise
garden in a rocky place
where the power, tender-
ness and wisdom of
human hearts awakens

Ahamtouli is created
through true friendship
Through touching ancient threads
across cultures and centuries
At long last, we are building
together instead of tearing apart.

This dialogue of design
is not a lecture.
It's a conversation
Ahamtouli is a place of peace
where questions are
answered without words
and we can just live
Ahamtouli is where
a world leader
shares a meal with
a stone mason
and each discovers a secret
without the other one
knowing they revealed it.

SITE ASSESSMENT

Location

Global

Regional

Local

Overview

Ahamtouli rests on a predominantly south-facing slope. It includes a small watershed and a few sub-ridges. The site currently includes a holiday retreat for the owners, their family and friends. The land is being developed and maintained by a small staff of locals with input from a range of consultants.

The elements play a key role while living at Ahamtouli. The sun shines fiercly on the mountain throughout the summer. The wind sweeps through the site with terrific force during seasonal storms. The limestone earth takes in the rain or sends it down the slope, leaving behind bare rock and tough plants. Ancient paths cover the hills and aged olive orchards are dotted with wild figs and chestnuts.

This land has been crafted by elemental forces and generations of human stewardship.

Site History

The property is spread across 30+ parcels and is continuing to grow. Most of these parcels are in a semi-abandoned state. The area contains a mosaic of different land cover types. Some areas have sizeable regenerating oaks and chestnuts. Other areas have olives that are being minimally maintained or that have been abandoned. Still other areas appear to have been cleared within the last 5-10 years and are predominated by chaparral. There is an area near the top of the hill where a previous land owner has planted grapes. The southernmost parcel has a high density of cypress trees. On one of the parcels to the west is a large, abandoned stone house surrounded by an abandoned food-producing landscape.

The Old Stone House of the Yanokopoulos Family.

SITE ASSESSMENT

Regional Context

The island of Corfu is in the northwest corner of Greece. It is the lushest, wettest, and most tree-covered of the Ionian Islands. The landscape has been heavily manipulated by people for thousands of years.

12th Century Venetian rule resulted in the planting of now ancient olive plantations, which cover most of the island. Much of the hillside agricultural lands across the island have been abandoned. Many of these spaces are regenerating into oak and chestnut forests.

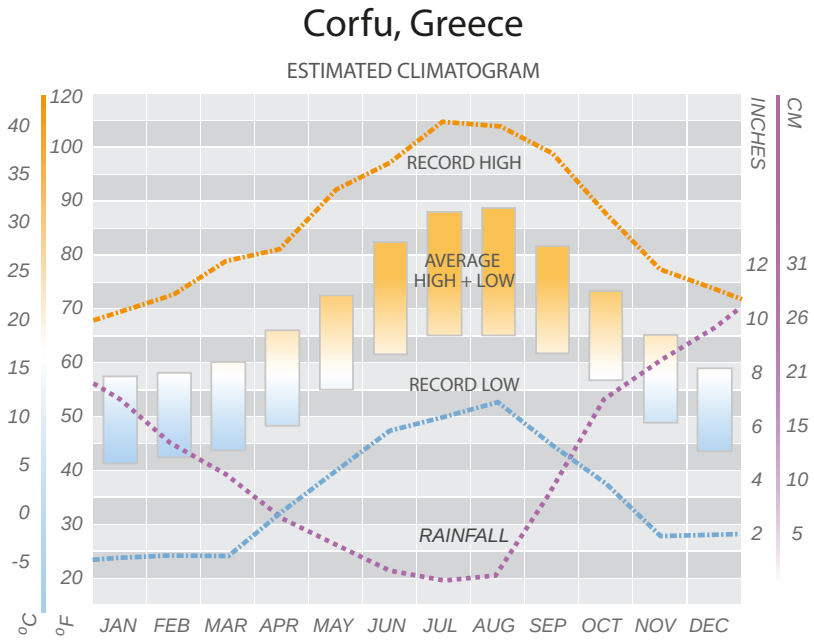
The island economy has been driven by tourism since the 1960s. This presents some opportunities and challenges. There are also some great allies in the area for a project like this including organic growers, project managers, and green design professionals.

A view over old Corfu Town.

Climate

This hot Mediterranean climate receives 137 cm (54 in) of rain on average per year. Most rain and cool weather falls between October and May with June - September being dry and hot. Yet, the warm Mediterranean Sea keeps the air relatively humid during the dry season. The sun is intense in summer with average highs in the low 30's C (86 F). Winter temperatures seldom drop below freezing though it has occured in recent years. Rain is often accompanied by thunder, lightning, and strong winds.

Hardiness Zone: 9b -3.9 to -1.1°C (25 to 30°F)



Current Land-Use

A parcel near the main road contains a small, off-grid retreat for friends and family. Water systems collect and filter rainwater with occasional dry season lorry deliveries (starting as early as June). An 8 kw photovoltaic array feeds into a large battery bank to power the site with a backup diesel generator. A mid-sized wind turbine is on site but is not currently in use. Garbage and recycling are serviced by the housekeeping staff and municipal systems. Wastewater is treated in an SBR water management system, which feeds irrigation lines. Structures are primarily reinforced yurts on stone and concrete terraces with hardwood decking. Electric heating and air conditioning units are used in addition to fans and small woodstoves. A solar collector and an electric backup provide hot water.

The land extends from the road to the top of the ridge.

SITE ASSESSMENT (CONTINUED)

Geology

The landscape is steep, with nearly 120 m of elevation change across the contiguous property. The site has minimal topsoil, which is found mostly on terraces and in drainages. Exposed bedrock is commonplace. In spite of a substantial amount of clay content, the soil contains broken rock and drains freely. We saw minimal flow during heavy rain events and the water table is extremely deep. The property has been extensively terraced for hundreds of years. As expected soils are slightly alkaline, edging toward neutral in the forest areas. The grape terrace soils differ in that they are highly acidic (ph 5.5). This may be due to fertilizer use during grape establishment. A forested ravine (called the rema) runs through the middle of the property, however locals say water has not flowed here in their lifetimes.

Layers of exposed bedrock.

Ecology

Substantial tree cover blankets the slopes consisting mainly of olives, oaks, and cypress. Where the trees have been removed there are scrubby areas of chaparral interspersed with ephemeral bulbs. These characteristics indicate that this is naturally a fire ecology. Thus fire management considerations are critical for long-term success. There are many wild relatives of popular fruit and nut trees that may be grafted over to preferrable varieties.

Hunting and habitat disturbance led to a notable lack of mammal and bird populations. Reptile diversity and populations seemed relatively high. Free-roaming goats are an issue that must be addressed in the area. Although there are relatively few animals around, there are predators that will kill small livestock. Grasshoppers are a major issue for crops.

Plantings for local pollinators.

Base Map

SITE ASSESSMENT

Summary

There are a number of land and human factors that are driving this design. Some of these are unique opportunities upon which the design capitalizes and others are constraints that must be addressed for the design to be viable.

The sheltered mediterranean climate provides excellent opportunities for growing a wide array of productive plants. Most buildings will require some sort of minimal heating in the winter. The design must also seek to transport water from the wet winter to the dry summer for domestic and agricultural use.

The topography of the site is another major driver. The elevation change is advantageous in that most of the property can take advantage of gravity-fed water systems. However, the steepness also makes access difficult. Locating vehicle and foot access according to topography is an important task. The hundreds of retaining walls on site are a major benefit as they provide access, retain soil, and provide warm, protected microclimates in many areas.

Much of the existing vegetation on-site will also impact the design. The most intensive impact from the design will be concentrated into recently disturbed areas. The existing grapes, olives, and chestnuts are a great headstart for a food production system. The wild, graftable species scattered throughout the property are also a great boon. However, many areas on the property area also quite brushy and will need to be addressed as part of a fire management plan.

The site offers a great opportunity to provide habitat for local wildlife. However, the roaming goats will demand garden fencing or other protection strategies. Also protecting livestock from wild (or domestic) predators will be essential.

Social considerations in the area will also be design drivers. Finding experts who can help with various parts of the project may be challenging as many Corfiots are now concerned primarily with tourism, not house design, agriculture, or forestry. That said, this is an excellent location for a retreat with much tourism infrastructure already in place. Developing staffing and crew may be difficult with Greeks, Albanians, and foreigners collaborating and finding specific partners on Corfu with key skill sets will be important.

Constraints & Opportunities

CONCEPTUAL DESIGN

100 years ago...

100 years ago we planted these orchards. We knew we would never see their fruits, and but we did it anyways. We dug the holes, planted the trees and brought them the water they needed to survive. 100 years ago we built these homes. We knew they would stand long after we had left and house people we could never know. 100 years ago we started this journey. We did not know where it would lead yet we embarked. We had a vision that was at once ancient and new. We saw a place where life and land wove together. A place where people shared their passions, challenges and their lives. We didn't know what we were doing but we had a vision. We listened to the land, to the community and to our hearts. They spoke in laughter, latin and birdsongs. We built. We planted. We planned. We failed. We learned. And we succeeded.

100 years ago they made this project for us. They did not know us. They only dreamed of us. Yet here we are, in the fruits of their vision, their labor and their passion. We understand that it was not the easy road. There were challenges. There was conflict. There was uncertainty. And there were rewards, all along the way. Some of them were great; the relief and satisfaction of manifesting a dream. Some of them were tiny; a cool drink in the shade of a young tree. And all the while the greatest rewards would always be reserved for the communities who did not yet exist. And so we will continue the work. A century in and with so much to show, yet so much more to offer. We will share what has been created. We will spread what has been learned. And we will strive to continue this vision, into our common future.

Concept Overview

The patterns and needs of the various users of the property influence the design of the space. In essence, there are three communities of users: family and friends; retreat guests and hospitality staff; and agroecology students and staff. Each of these groups has different needs, while also sharing things in common.

Therefore, the design crystallizes around a schematic that allows each of these groups to have the experience they seek while also encouraging crossover and amiable interaction between individuals. All parts of Ahamtouli fall into the retreat zone, the agroecology center, or the liminal space where the two meet.

Planting an Olive Orchard is working on behalf of future generations.

CONCEPTUAL OVERVIEW

The Retreat

When arriving at the site, the first place you are likely to land is the Retreat, Ahamtouli's public face. This is where many visitors will spend much of their time. The retreat will utilize crops from the broader landscape when possible. This may include food, firewood, honey, eggs, teas, etc. The retreat offers a gradient of opportunities for visitors. While all visitors will utilize retreat infrastructure, the curious ones will wander into the liminal zones and the intrepid ones will explore the agroecology center, perhaps even pitching-in on a project for a day. The retreat will be a big part of the economic viability of the project.

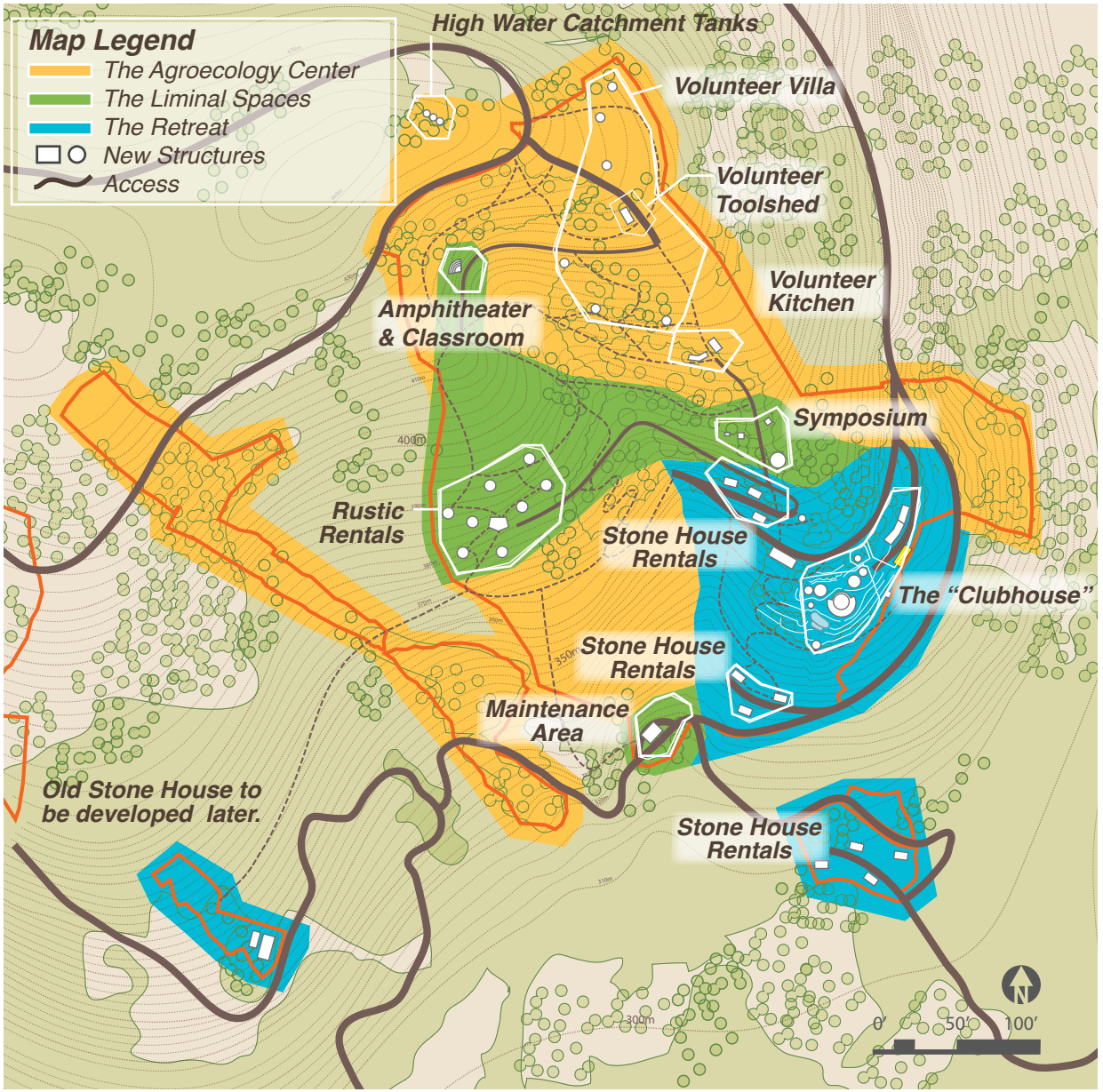
Liminal Spaces

The liminal spaces are where guests and visitors are most likely to cross paths with the workers and students who are living a land-based lifestyle (*where a stone mason might have a conversation with a world leader, perhaps*). These areas are still within the "public" part of the property, but are geared for more intimate connection. The liminal spaces incentivize all of the different site users to come together and share an experience together.

The Agroecology Center

Agroecology is the study of ecological processes applied to agricultural production systems. This definition gets at the heart of how the production-oriented aspects of the property will be designed, managed, and cultivated. The agroecology center is where productive systems for food, fiber, fuel, fodder, fertilizer, and medicines will take place. It is also where people will come to learn the hands-on skills to transform agriculture to a regenerative model wherever they go. Products from the agroecology center will go to support those who dwell there and the retreat center first and foremost. Surplus can be sold locally on the island.

Concept Map



Siting

The retreat is sited with good access to roads and focused around the area where much of the development to date has already taken place. The space is already well set up to host people and provide them with an unforgettable experience. The retreat landscape is quite steep, but terraced. Vegetation in this area is mostly shrubs with regenerating oaks poking through. It offers a breaktaking view of the Ionian Sea and the mainland beyond. The site is also quite exposed to the elements. The summer sun is intense here. Wind and pounding rain also have major impacts. Soft vegetation, flowers, and fruits in the landscape help to soften the space and cut down on glare.

Character

The retreat area offers an opportunity for guests and visitors to be exposed to new ideas, a different quality of life, and events that awaken consciousness while at the same time providing comfort and security that basic needs will be met. Spending time here elicits a sense of curiosity and desire to explore. Comfortable furnishings, beautiful landscaping, and the sound of moving water help to make this space inviting. The swimming pool and soon-to-be movement space and treatment rooms provide opportunities for revitalization. This is a place to flow with the forces of life.

Users

The primary users of this area are family, friends, paying guests, and housekeeping staff. The design of the space will ensure that everyone feels comfortable, safe, and engaged. The landscape and amenities will provide much of this, however, a huge part of this experience will be provided by the staff. Hospitality will be an integral part of the educational experience. Comfortable and relaxed guests will be open to novel ideas and more receptive to learning learn from their environment.

Thus, it is important that access is as easy as possible, back end infrastructure (i.e. energy rooms, work areas, storage, etc.) is well-organized, and workers are well-cared-for.

Infrastructure

The retreat is where you will find the greatest density of infrastructure. Part of the retreat is referred to as the clubhouse. This is where one can find the kitchen, indoor dining, gathering yurt, bathrooms, swimming pools, decks, and reception. Surrounding the clubhouse will be three clusters of stone house rentals for paying guests. The stone houses will match the area's vernacular architecture, but also contain features for more ecological living. Included with the retreat is also the old stone house a bit down the road. In the future this house (and possibly others in the area) can be refurbished to serve as deluxe accommodation or conference centers.

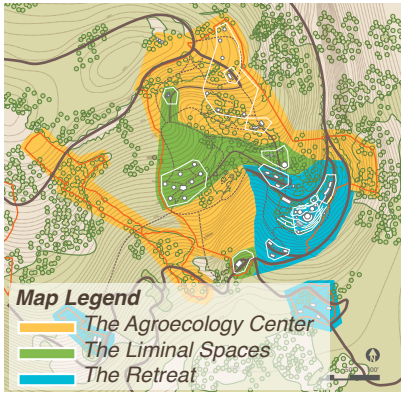
Details make the space.

Ahamtouli has already established a unique and attractive design language.

LIMINAL SPACES

Siting

The liminal spaces are sited such that they are on edges, where parts of the retreat touch the areas managed by the agroecology center. This allows for easy access for both the users of the retreat and the users of the agroecology center. The sauna, plunge pool, and surrounding sample cropping systems are centrally located for easy access by anyone. The rustic rentals will serve retreat goers, but are sited within an ancient olive grow managed by the agroecology center. The maintenance area has been sited to minimize noise issues in the retreat while maintaining excellent, centralized access to all parts of the property.



Character

While a retreat guest may never see the chestnuts growing in the hinterlands and a agroecology student may have little cause to go into the stone house rentals, these liminal spaces will serve all users. The landscapes in these areas will be an interesting blend of the productive and the beautiful. Infrastructure will be rustic, but clean and tidy. These are the first places to which curious users of the property will be drawn. All users will get a glimpse of life as an earth steward. This is where Ahamtouli can showcase that living lightly on the land isn't about toil and sacrifice, but rather about finding a new type of luxury.

Users

The rustic rentals are most likely to attract guests with a greater commitment to sustainability and they will naturally have a greater interest in those working the land. The area between the volunteer villas and the clubhouse provides a unique service to those on the property. It is intended to be a social space for relaxation. In ancient Greece this function was provided at the *Symposium*, so it seems appropriate to refer to this area as such. All are welcome here to relax at day's end. The maintenance area below will serve the whole property and this is where the people working to make both the retreat and the agroecology center function will meet and accomplish their tasks efficiently and effectively.


Paths are meeting places.

Infrastructure

The rustic rentals will consist of sturdy, yurt-like structures built on top of water tanks. They will have composting toilets and basic amenities. Guests staying here will be seeking an immersive off-grid experience, maximizing positive impact on the land while minimizing harm. Guests leave their cars below and access the rentals on foot. Symposium infra-structure is for everyone to share and includes a multi-use space with games, a library, comfortable seating, mellow lighting, and soft music. The area also includes a sauna, plunge pool, easy-to-walk paths, and demonstration gardens.

The maintenance area will include indoor, multi-functional work space, a covered drive-through delivery area, a boneyard for materials, parking, and energy infrastructure.


A simple sauna makes a venue of compelling conversations.

Siting

The agroecology center encompasses most of the property. The rema, which will remain largely wild is where students can observe nature's patterns. The cultivated landscape is where they will learn how to apply nature's lessons. Within those cultivated areas are a wide range of terraces, some wide and gentling sloped, some small and steep. Different crops have been sorted out based on sunlight, soils, wind, access, and existing vegetation. The diversity of crops growing in different areas will tie into the educational aspects of the site.

Character

Wandering through the agroecology center grounds will transport you back to the days where most people lived an agrarian lifestyle in contact with nature. Strolling through the terraced gardens and orchards on foot and working the soil with your hands will connect you with an ancient way people lived in these hills. However, the agroecology center will not be an anachronism. Blended with the agriculture of ancient Greece will be appropriate, modern tools and production systems. Screenhouses, new climate-appropriate crops, and small utility vehicles to help with the heavy lifting will also be used. Yet it will be clear that this area blends production with functioning ecologies.

Users

Primary users of the agroecology center will be the agricultural staff, visiting students, and the occasional satyr wandering through. Students and volunteers from around the world will gather here to learn how to coax food and other products from the ground first hand. They will learn how to do it in alignment with nature, rather than against it. These students will require teachers to help them understand everything from production systems to design to self-reliance. In addition to these teachers there will also likely be a staff of people whose primary role is using the space. For all of these users, practical access, storage, and processing space will be key features of the site.

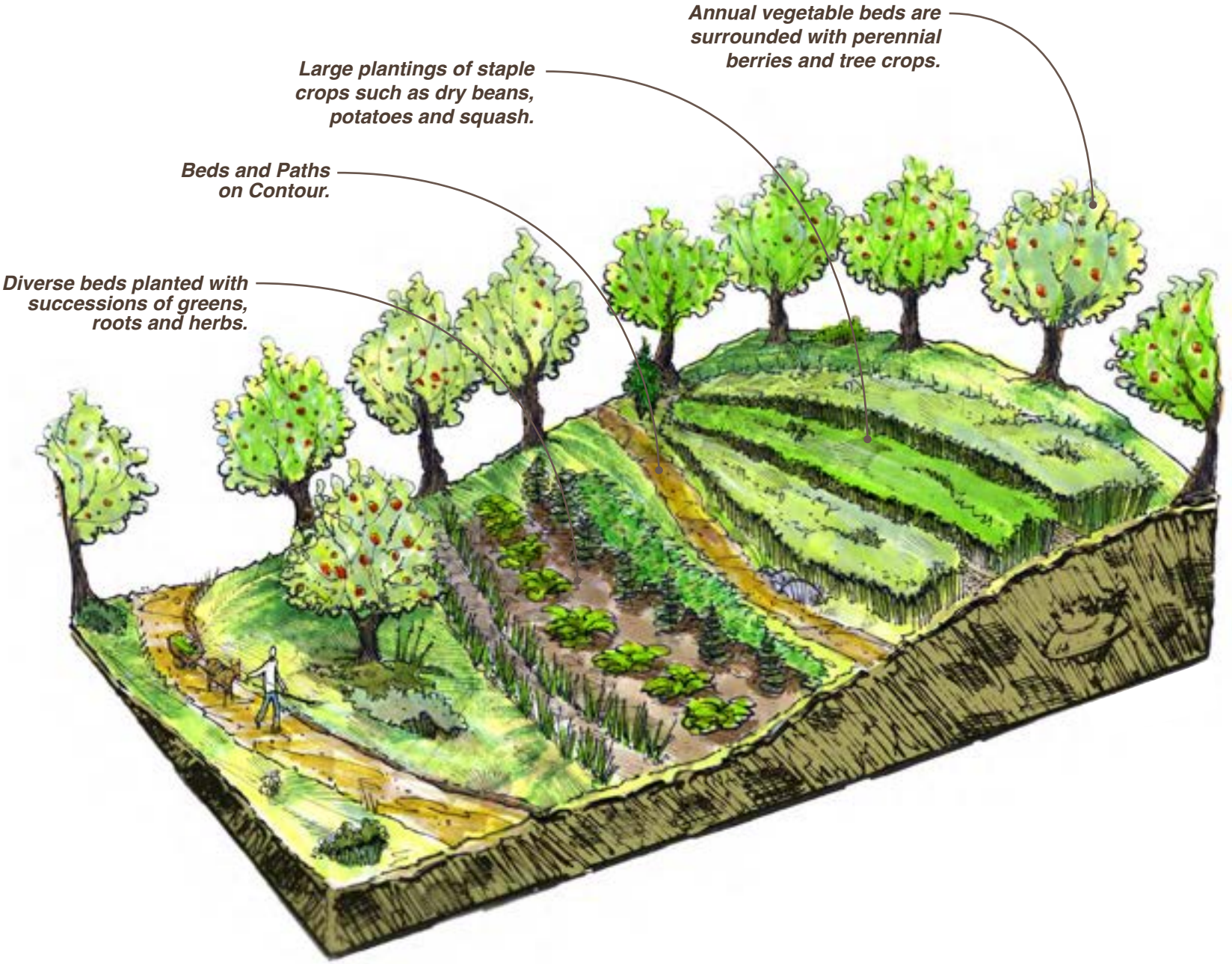
A well-maintained vegetable garden is a rich ecosystem.

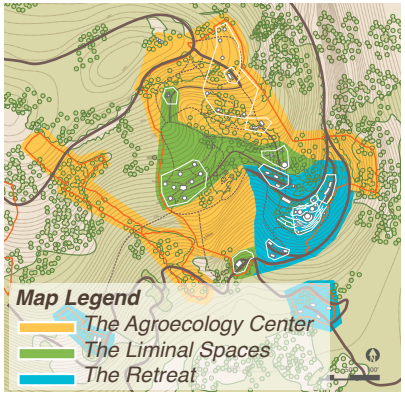
Beautiful and nutritious crops.

Storing a garlic harvest.

Infrastructure

The productive landscapes will have good access, terraces, screenhouses, greenhouses, shadehouses, tool storage, and rainwater collection structures. There will also be an amphi-theater for outdoor classes and cultural events for the agroecology center community. In addition there will be a cluster of infrastructure for those living and working in the agroecology center called the Volunteer Villa. This area will have a shared kitchen, dining space, indoor space for inclement weather, swimming pool, toilets, showers, sturdy yurts or quonsets for lodging, and all the basics necessary for good self-care as a worker of the land





Working from Patterns to Details

This section of the document breaks into several thematic areas, each outlining specific information and recommendations based on the project's holistic nature. The infrastructure themes are: Buildings, Water, Energy, Access, and Waste Management. Some of the recommendations will require further research.

Each recommendation is a response to the physical site, the mission of the owners, and the cultural context in which the site exists. In each section you will find ways in which challenges have been turned into opportunities and advantageous conditions have been leveraged to maintain/build ecological function, minimize maintenance, and allow the site to function as a whole.

Contractor Guidelines

This design will be implemented by a variety of contractors, with different backgrounds and priorities. The following contractor guidelines will clarify the priorities of the Ahamtouli project. By following these guidelines, it will help contractors to make the best decisions for the overall project.

Simplify technology

- Always look for low tech solutions and appropriate technology to get a job done.
- Prioritize passive systems (i.e. passive heating and cooling vs electric furnaces)?
- Whenever possible, take advantage of gravity. Minimize the total number of electrical pumps on site.
- Use wind and shade for cooling rather than A/C.

Design for off-grid compatability:

- Grid-tied designs are often wasteful because electricity is plentiful, water just comes out of the tap, and wastewater goes "away." None of that is true for this off-grid project.
- Before designing systems or choosing technologies address conservation of existing on-site resources (water, electricity, money, etc.).
- All contractors need to think in a cross-disciplinary manner. A wastewater processing system that uses tons of electricity is incompatible with being off-grid. Sometimes the "easiest" technology is not appropriate for an off-grid project.

Create clear, legible systems and document them.

- A pump house or an energy room should not look like a plate of spaghetti that only the installer can interpret.
- For example: pipes with blue tape are potable, purple tape are greywater, red tape are blackwater, green tape are ag water, etc.
- Protect critical components of systems in an easily accessible shed or room. Develop a clear and legible layout before installation. Clearly label or color code pipes and wires so that other contractors or staff can see what's going on. Always assume someone else will need to work with whatever you've installed.
- Clearly document systems once installed (create "as-built" drawings). Map and label installations and keep documents up to date.

Prioritize resilient systems and technologies

- There is no grid connection. There is not always a technician available. Will your system/technology function without outside water or power? If so, for how long? If not, what happens?
- All systems should have one or more backups. We know technology fails from time to time. Make sure whatever you're installing has a back up (i.e. wood-fired water heater backup for on-demand propane water heaters which backup solar hot water primary).
- Once you find pieces of technology that work well for the site, use them repeatedly. For instance, if you use the same model of inverter or pump or generator throughout the property, you will simplify the stockpiling of replacement parts.

Store all collectible water

- If there is a roof or surface, tie it into a tank. If there is a tank, put a roof over it.
- Having enough water is going to be one of the biggest challenges to making the site flourish. Therefore, err on the side of having more water collection capacity than you need, rather than less.
- Make wise use of wastewater. All greywater should end up going to beneficial plantings.

The stonework and existing plantings have already created unique habitat.

Introduction

Many new buildings will appear at Ahamtouli en route to turning the vision into reality. The character and details of those buildings will vary throughout the property. However, the commitment to low-tech, climate-responsive materials and practical construction methods will be thematic throughout.

Clubhouse Modifications

Development of the clubhouse will include the construction of a few additional structures. These buildings will improve the current use of space as well as expanding the service offerings of the clubhouse.

Reception and Entry Experience

One change that stands out is the conversion of one of the yurt dwellings into the reception area. Currently the entry experience involves being dropped off by taxi or shuttle above above the clubhouse and descending through an attractive garden to the reception area. Guests who have just parked east of the kitchen will access reception via the terrace and stairs leading up to the current chicken coop. The terrace will be planted and developed as a shaded outdoor lobby to help guests relax. Imagine fragrant flowers, snack fruits, and dappled shade with signage to inform and orient visitors.

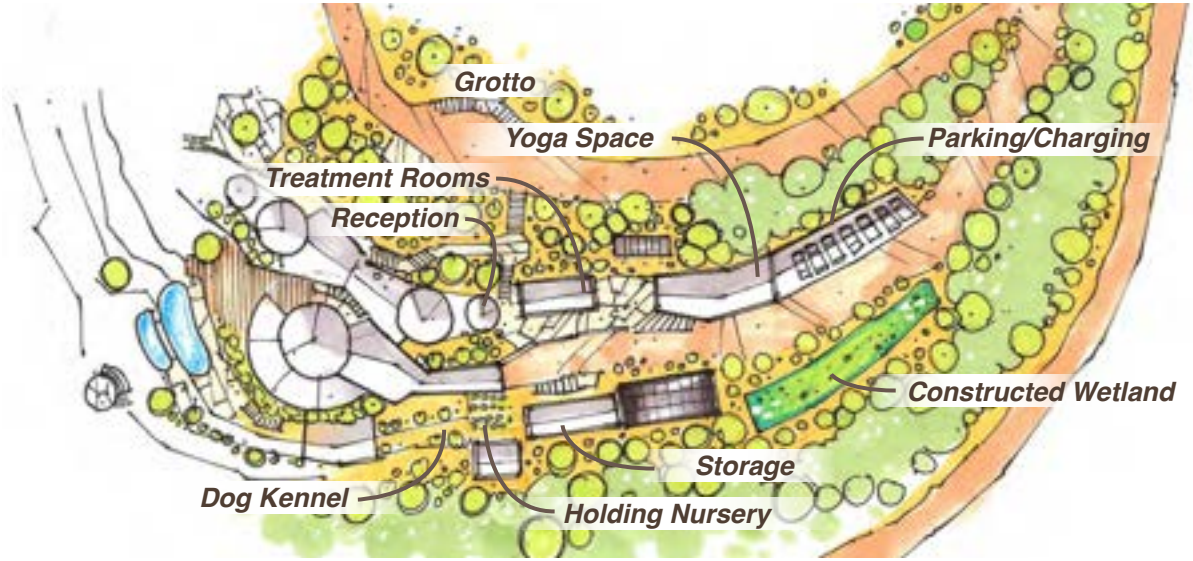
Other new structures in the clubhouse will include the following:

Yoga/Exercise Space for 12 - A pavilion sited above the existing energy room and water tank will tie the space into the reception area. Imagine a roof with open walls for exercising or movement. Clear, roll-down panels can be added for inclement weather and photovoltaic panels on the roof may be practical.

Treatment Rooms - Just west of the Yoga/Exercise space will be a few quiet rooms for massage, counseling, energy work, and other holistic health treatments.

Parking - The existing parking area will expand to the east and include an electric vehicle charging station.

Storage/Cellar - The existing photovoltaic array could be lifted and a building put underneath. This option would create a cellar and event storage space accessible from the terrace below and protect the panels from rocks flung from the gravel road.



Workout Area / Natural Gym - The existing building below the kitchen can be replaced with an open-walled structure housing workout equipment. The area directly around this can have natural gym features where guests can workout with wood and stone from the environment.

Playground - Below the clubhouse along the path to the stone house rental cluster to the southwest will be a small play area for kids. This should be located such that parents can see their kids from the clubhouse deck.

Holding Nursery - This will be where the kennel currently resides. Details in Landscape Themes Section.

Stone House Rentals

There will be three clusters of stone house rentals. Each stone house will utilize passive solar design for heating, cooling, and lighting and collect rainwater from all impervious surfaces (roofs and stone patios). The stone houses design concept includes three structural layers: a concrete cistern, a stone first floor/patio, and a timber frame upper-floor and roof. All designs will integrate indoor and outdoor spaces and provide all the comforts of a modern home to meet guests expectations. Stone patios will not rot, so should be prioritized. Inside, wood paneling and natural plasters will help to manage moisture. The rentals to the southwest of the clubhouse have good road access and will be designed for easy, safe access for guests with limited mobility.


An inviting accomodation.

Rustic Rentals

The rustic rentals are designed for guests who want to experience a lifestyle that is gentler on the earth. Each unit will be a perched atop a tank or cistern. They should have bolt together walls to maintain status as “temporary” structures. The rustic rentals will include sturdy, yurt-like structures as well as quonset-like structures which are temporary in nature, easy to move and will not trigger a need for permitting. Each unit will have its own kitchenette, composting toilet, and greywater system. The area will have a shared shower block and dining pavilion (outdoor kitchen) with a grill. Guests will be able to experience what it would be like to live a life where sustainability and off-grid considerations rule the day.

Volunteer Villa

The lodging structures in the volunteer villa will be the same as the rustic rentals. Some of them may not be right in the villa cluster, but rather scattered throughout the production landscape. In addition, the volunteer villa will include a shared indoor/outdoor kitchen and dining area, composting toilet block, shower and laundry block, and swimming pool similar to the one at the clubhouse. The shared composting toilets and kitchen can take the place of providing these functions in each individual lodging structure.

The Symposium

The symposium appears in the liminal space between the volunteer villa and the clubhouse. It will include a simple structure to serve as a “rec hall.” The rec hall is a social space containing a library, games, comfortable seating, mellow lighting, and good music for anyone to use. It will provide many of the same functions as a village pub. Outside there could be a stone patio with a small fire pit covered by a grape arbor for use when the weather is nice. Nearby will be a bathhouse with a sauna, changing rooms, and a plunge pool with an outdoor shower.

The Amphitheater

The amphitheater is where classes and performances can take place for guests, volunteers, and workers. It is nestled into one of the wide terraces in the regenerating oak/chestnut forest. It should be a simple structure made of stone and wood. Stone stadium seating and benches will follow the contours of the land. Under the shady canopy the area should be cooler and moister on a hot summer day. The amphitheater can be surrounded with shade-tolerant fragrant plants and vegetation that will attract songbirds. The whole area should have a near-magical, grotto-like feel.

An Outdoor Living space.

The rentals are surronded by a collection of outdoor living spaces.

Yurts perched atop terraces provide a unique, land-based living space.

The Old Stone House

The old stone house to the west has a lot of potential. Though it is currently in a state of disrepair, the space could be renovated into a prominent and unique feature of the Ahamtouli experience. This will be an intensive and costly development, so should be reserved for a later date. At that time, the specific use of the space can be designated to meet the greatest need at Ahamtouli. It could provide more lodging akin to the stone house rentals or become a stylish stand alone clubhouse for corporate groups, wedding parties or family reunions.

Until a plan is developed, access to the site should be limited and dangerous elements demarcated for the safety of the guests.

A stylish clubhouse with both classic and modern design.

An efficient workshop will facilitate the development and maintenance of the entire project.

The Maintenance Area

The maintenance area will contain several practical buildings. Access should be laid out as a “horseshoe” so that a large vehicle can drive through rather than having to turn around. If so, the multi-use shop and storage building should have an awning that extends over the “drive-thru.” This will allow for loading and unloading on rainy days as well as an outdoor work space with rain/sun cover. The buildings themselves should be as practical and bare bones as possible. Simple pole barn construction should suffice and insulation is not likely necessary. These need to be utilitarian, not fancy.

Behind the building will be an area where bulky materials (i.e. pipes, lumber, bricks, etc.) can be stored in an organized manner. These should be easily accessible, but screened from view. Maintaining a modest stockpile of wood and metal expedites small development projects.

Inside of the structure, there will be tools and space for a range of activities. A small shop with basic carpentry, metal working and mechanical tools will support ongoing site maintenance and development. Some specialty tools may also be located here including processing equipment for food crops, replacement parts for modular ons-site systems, such as electrical or plumbing.

This area can also include covered parking for Ahamtouli’s facilities staff. and a central collection point for trash and recycling to be hauled away.

A small construction project.

Overview

Water touches every other aspect of this project, so an efficient design is critical for success. Since rainwater is the primary source, all roofs, decks, patios, roads, and other impervious surfaces will be used for water collection. Organizing, mapping and clearly labelling this complex system will facilitate long-term management.

There will be 3-4 types of water systems on the property. Potable water has been treated enough for drinking and domestic use. Ag water is untreated rainwater for irrigation. Wastewater will consist of grey- and black-water (see the waste section). The potable and ag systems can be integrated at specific, controllable points when necessary.

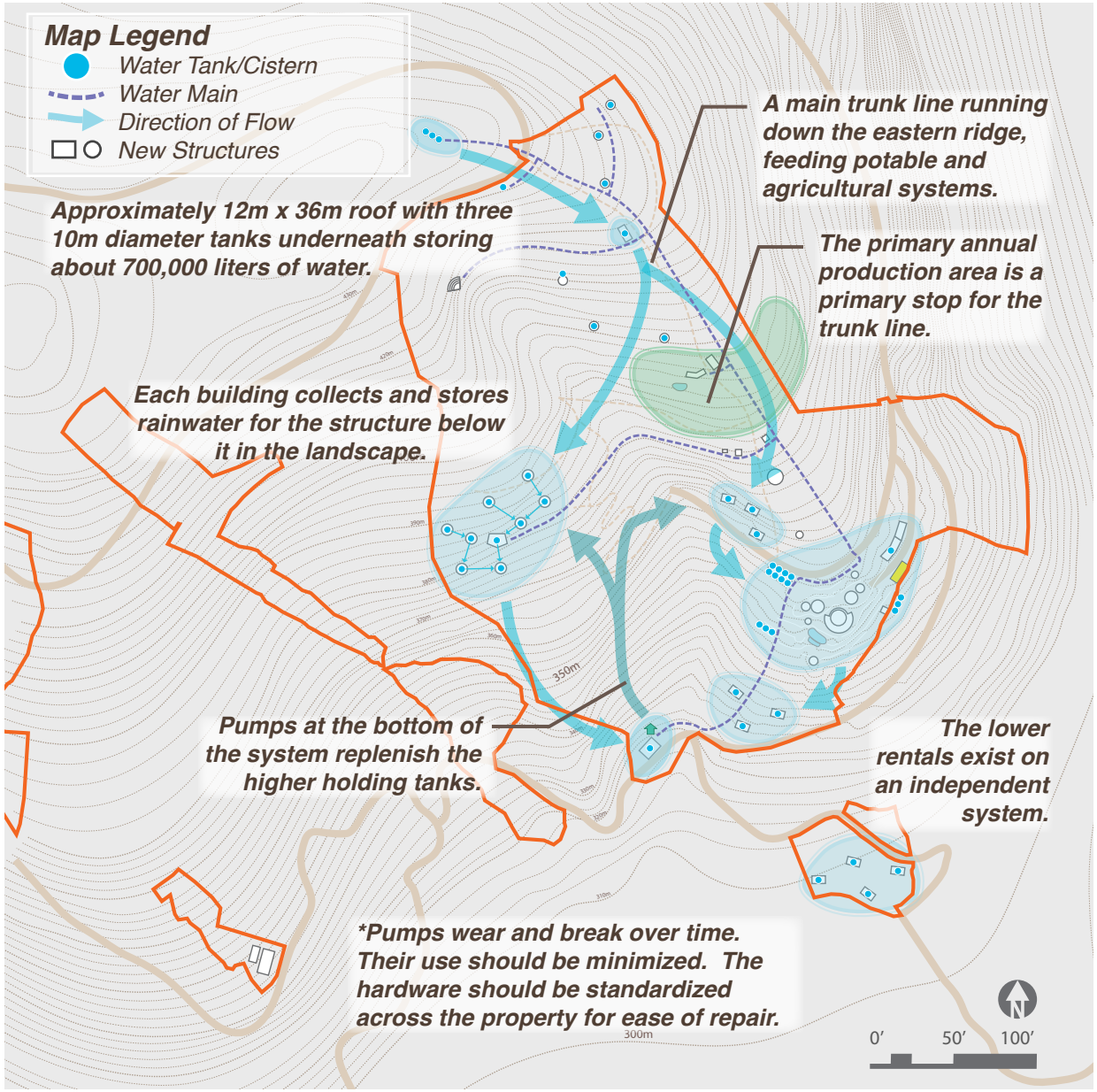
It is important that each of these systems is clearly marked at spigots, in valve boxes, and at manifolds, especially where multiple systems come together. Color coding, and an editable schematic will keep these systems straight.

Catchment

At the highest point in the property will be several large water tanks beneath a large roof for catchment. These tanks will fill during the rainy winter and get topped off with occasional summer rains. A main trunk line running along the eastern ridge will distribute this water to other storages and points of use below. This water may be filtered for potable water systems or used for irrigation in the landscape. Excess electrical production (via solar or wind power), will power a series of pumps to route water from lower points in the property back to higher points for increased pressure and redistribution. With sufficient wind, a direct mechanical pump at one of the lowest storages in the system may also move water back to higher elevations without the need for electricity.

All catchment systems should start with a coarse filter to capture debris on the collection surface. Each system will use the first few liters of each rain event to clean the collection surface and then be discarded via a first flush system. The rest of the relatively clean water will be directed into the tank. Each of these requires a degree of consistent maintenance.

Water System Map



Potable

Filtered rainwater will be stored in food grade storage tanks and will supply all sinks, showers/ baths, and swimming pools. Rainwater won't have the minerals your body needs, like groundwater would, so consider adding minerals to the potable tanks. Conservation strategies will help to make the most of this highest value water. Low-flow shower heads, foot pedal faucet controls for hand and kitchen sinks, shower timers, and a water conservation education program for guests will all help.

Every new building on site should sit atop a cistern to store the buildings roof catchment. These cisterns can supply water for locations lower in the landscape. When that is not possible (low in the landscape), a small pump can feed water directly to an uphill filtration system and potable supply. Small pressure tank can be integrated with the domestic system near the point of use for increased head. For the rustic rentals and volunteer villas, a simple, hand-powered jack pump can also be included for drinking water drawn from a nearby storage tank without electricity.

A pressure tank & 3-stage filter.

Between the non-potable storage cisterns and the point of use there should be some sort of filter followed by a potable storage tank. There are several filtration option available:

3-Stage Filter:

These are common, pressurized household systems consisting of a sediment filter, a charcoal filter, and UV light. These systems are easy to use and provide clean drinking water.

Slow-Sand Filter + UV Light:

This low pressure system slowly moves water through a column of biologically-active sand. This removes most contaminants and an additional UV light takes care of anything that happens to get through. For the correct system sizing see Blue Future Filters.

Simple roofs can allow tanks to catch their own water.

Ag Water

Agricultural water only requires minimal filtration but, just like in the potable systems, conservation will be the first priority. Drip irrigation, mulching, living ground covers, and reusing wastewater will minimize the amount of ag water that is needed. Any tank that hasn't been treated for potability can be used for irrigating crops and landscapes.

Cropping systems on Corfu seem to be subject to the "boom and bust" nature of the rains. Irrigation should only be needed outdoors during the summer drought. In the winter it seems that waterlogging is actually a greater issue for many crops.

New perennial plantings require a lot of water to get established as well as upfront conservation techniques. Soil gels are absorptive silica-based additives used during planting. They absorb many times their weight in water improving drought tolerance and reducing irrigation demand during establishment. In periods of extreme drought/ heat, wax-based antitranspirants can minimize transpiration in new plantings. This spray-on wax coats the leaves, preventing the release of water, helping young plants to survive an extreme dry period. These products are unnecessary once perennial crops are established.

All ag water storage will have overflows that connect to storage tanks lower in the landscape. If these are full, surplus water from any given cluster should be routed to a small, nearby habitat pond. Just a few square meters in area with an impermeable liner, habitat ponds will attract birds, beneficial insects, and amphibians. These creatures can then spread across the landscape eating spiders, scorpions, and other pests. Several of these ponds should be located where large terraces cross the rema. Others could be located near gardens in each housing cluster, when appropriate.

Overview

Ahamtouli will be completely off-grid. To do this, throughout the property energy systems need to be designed with some basic principles in mind. Energy systems should be decentralized, yet clustered. For instance, while there will not be a single, property-wide power system, each cluster of stone houses should share energy infrastructure.

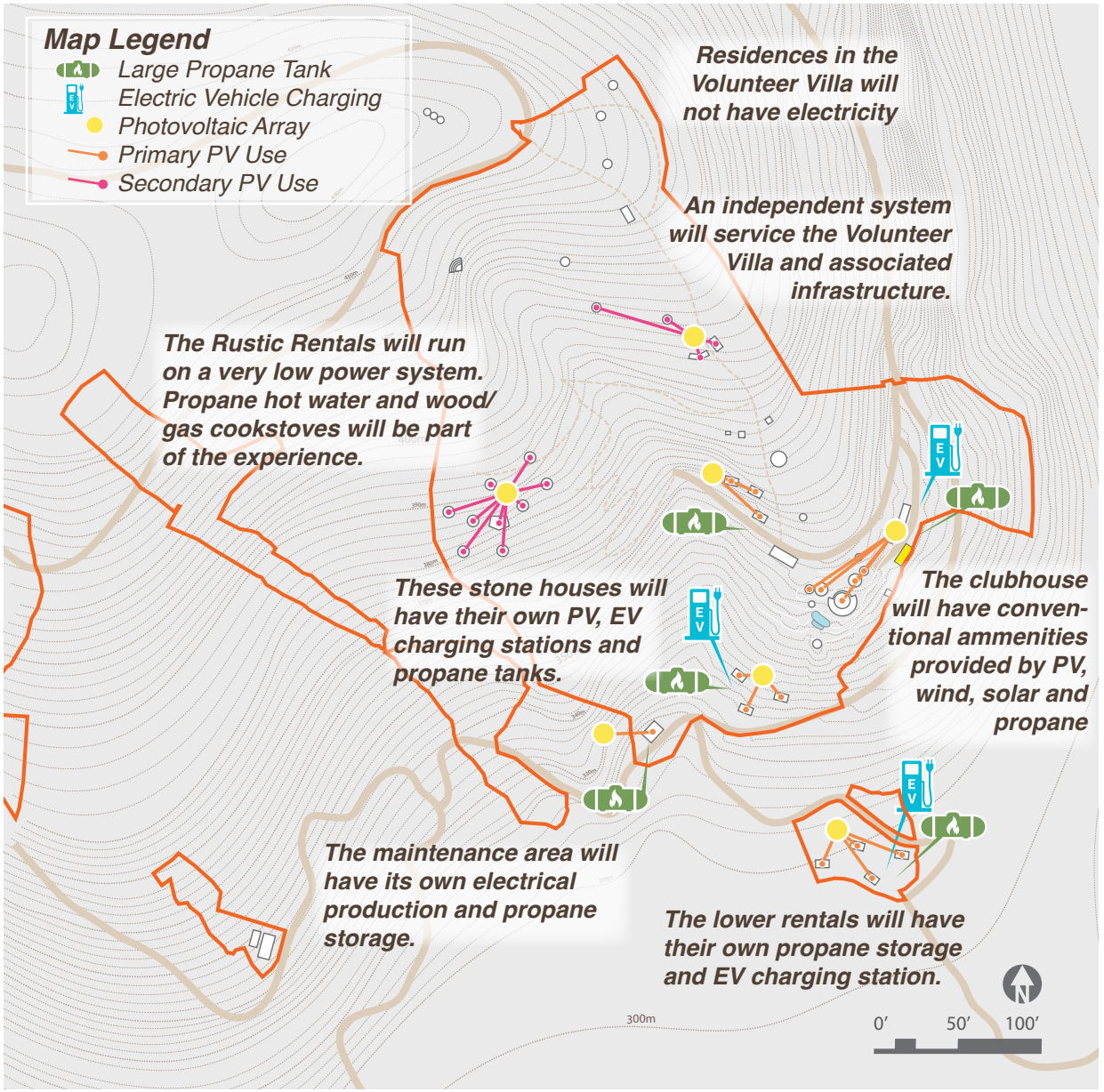
Given these parameters, there are a few expectations that need to be addressed. First, tasks that can be done practically without electricity and/or fossil fuels should not use it. Solar water heating should be the primary system with an on-demand propane backup rather than electric. Energy efficiency should also be a factor in making decisions about equipment. Many an off-grid power system has been compromised due to a high-powered blender. A/V equipment and special effects should be selected based on minimal power consumption and should always be shut all the way down when not in use. Some types of equipment that may be standard will not fit the practicalities of an off-grid project.

Conservation

There are a few simple steps that can be addressed in all existing and future development that will help to minimize the need for power. Identifying and eliminating phantom loads is a good start. A phantom load is when a piece of electrical equipment is consuming power even though it isn't actively being used. By installing power strips and/or switches, equipment can completely turned off when not in use. Or you can focus on buying equipment that doesn't have this issue. You can also consider motion-detectors and timers to help manage electric loads.

A common issue with off-grid power systems is damage to batteries by unsuspecting users consuming electricity beyond what the system can sustainably provide. The first step to avoiding this is to raise awareness. Each building with electric power should be equipped with a readout so people can see available power and the effects of their usage. In this way, each power system on the property could act as its own mini-smart-grid. Information could be available via phone, computer, and directly via a readout in each

Energy System Map



Conservation *(cont'd)*

building. However, the system must be designed to work even if the readout does not.

In the stone house rentals, this information would be available to users at all times. If they use their share of the power, they would be made aware that their usage is beyond what is sustainable. At that point, a propane generator would automatically kick in and supply additional power.

The rental yurts and volunteer villa will use slightly different design. Here we recommend including a low-voltage cutoff. This mechanism the shuts off power before the batteries are damaged (with the exception of a couple emergency lights in critical areas) The system remains off until it can adequately recharge. This type of visceral feedback is in line with both preserving the lifespan of the batteries and providing the users in these areas with an experience in line with their values. In case power runs down between guests, a backup propane generator can be started manually by the staff.

Sources

Electricity will primarily be generated via photovoltaics (PV) and wind. This matches the sunny, exposed conditions on the site nicely. Consider elevating the existing PV array for better protection from stones thrown from the driveway. The array will power the clubhouse area and can expanded with panels over the new parking area. Other areas with their own PV systems include:

- Three stone house clusters
- Maintenance Area
- Volunteer Villa
- Rustic Rentals
- Old Stone Lodge
- Shed area near top of hill (optional)

Each system needs an energy room or area for housing system hardware, batteries and backup propane generators. Whenever possible, use identical hardware and modular systems. It is easier to stockpile extra parts that can work for a wide range of repairs. Lightning rods and associated protective hardware will accompany each individual system.

Wind may provide a consistent additional power source. This may be particularly good for charging up batteries during an extended cloudy period. Once an effective wind generator is installed and proves its viability, additional systems can be tied directly into the PV infrastructure.

Cooking ranges, on-demand water heaters and certain vehicles will be powered by propane. Most importantly, propane will be the backup fuel for other systems. All propane tanks will need to be near roads where a refill truck can easily access them. Small tanks may be transported to the rustic rentals using a small vehicle.

Woodstoves, therefore firewood, will provide additional heat in various dwellings on the property. In addition, there may be wood-fired ovens, grills, moveable campfire pits, and wood-fired hot water on the property. Opt for the versatile wood/propane combo stoves for the rentals whenever possible.

Simple, reliable solar hot water.

Needs

Energy needs will change with the seasons. The tourist season (May - Sept) will involve a lot more visitors, thus leading to greater energy usage. Some uses will be general, such as lighting, personal use (computers, hair dryers, etc.), appliances, solar water heating, and water pumping/purification. Other uses will be more specialized (tools used primarily by site managers, firewood for heating primarily burnt during winter). Electricity and/or propane can be used to fuel vehicles on the property. Small utility vehicles, such as a Kawasaki Mule or Polaris Ranger, will be handy getting around the property. Electric versions may have trouble with the steep slopes. We recommend test driving on slopes before deciding electric vs. propane. Charging stations for electric cars will also run on one or more of the PV systems (clubhouse, each stone house cluster, maintenance area).

Propane Primer

One of the biggest draws for propane as a fuel source is that it is relatively clean system. The fuel burns without much soot and smoke, and the equipment does not accquire the same grimy patina as a diesel engine. Propane is easily available throughout Europe and it is versatile. Propane has an "indefinite" shelf life, making it a stable fuel to store. Having large tanks that are topped off routinely makes it easy to store up to several years of fuel on your property. Most gasoline-powered equipment can be converted to run on propane. By choosing propane as the primary fossil fuel on the property (instead of diesel) it simplifies repairs and maintenance.

An 1,800 Liter propane tank.

Intro

Getting to and around the site in an efficient and effective way can save time, money, and frustration. This all starts with a good plan. Making it easier to get to the site will be a good starting point. The road near the maintenance area needs to be widened for safety. That will help anyone coming from the Nissaki side. This can be accomplished by either building the road further out using common local methods, or cutting further back into the hill to widen the road (which would lose some space for the maintenance area). Any other areas that are hard to pass should be widened for easier access to the site as well.

Hierarchy

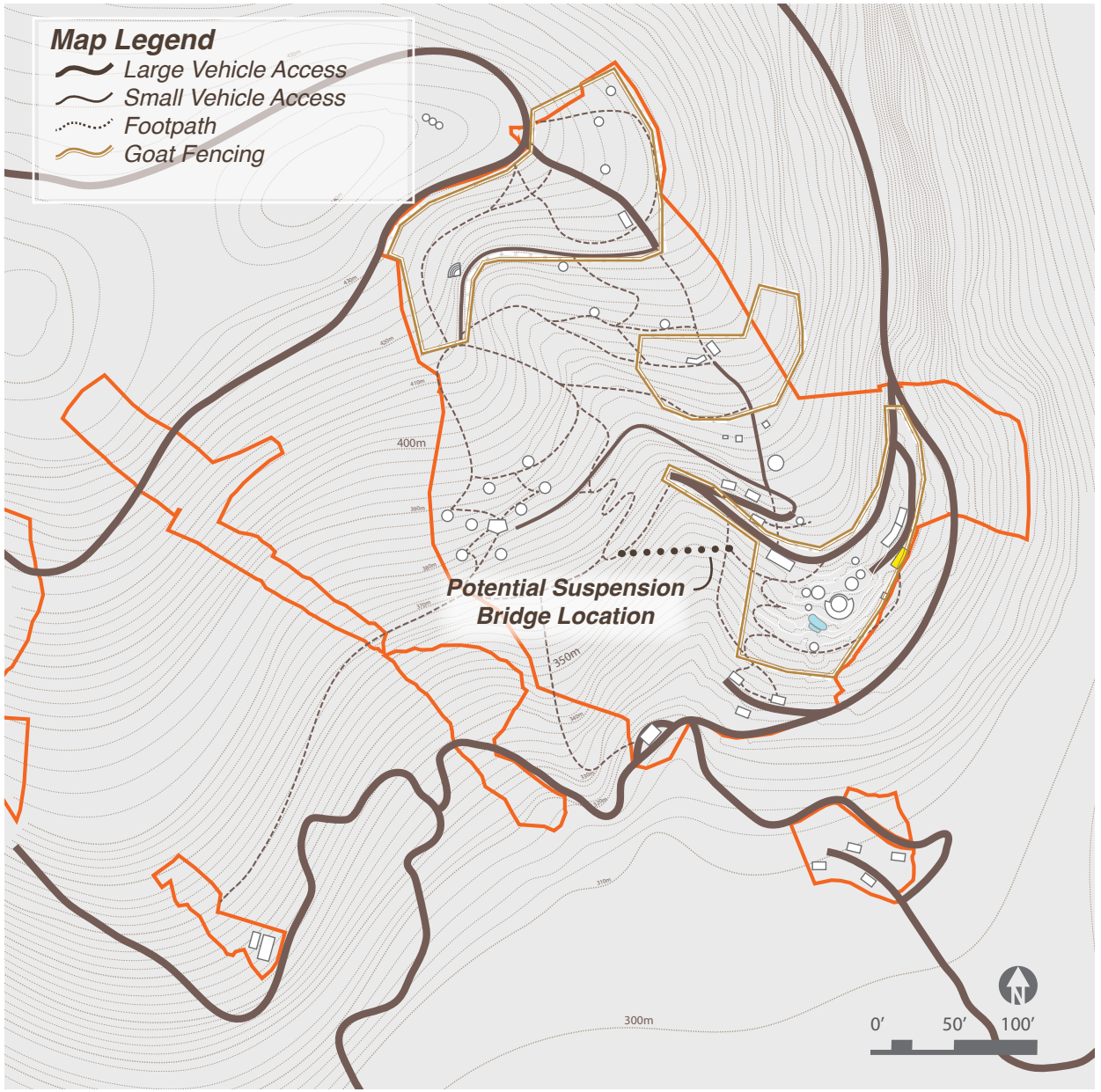
Once at the site getting from one area to the other should be relatively easy. Some areas of the property will need to be accessible by large vehicles (delivery trucks, heavy equipment, cars, etc.). Other areas may not need heavy equipment, but should be accessible by small utility vehicles. Yet other access will just be for foot travel.

Note that due to the steepness of the property and prevalence of bedrock close to the surface, there is no internal heavy equipment path connecting the bottom of the hill to the top. In order to go from bottom to top, car drivers will have to go around on the existing roads. However, the hill will be traversable by small utility vehicles and on foot.

All heavy equipment access should be installed early in the development process as this will facilitate construction in many areas. Other types of access can be established as needed.

Unique signage adds character.

Access Hierarchy Map



User Experience

Guests and residents will wish to explore the property so paths will all have signage telling people where they lead. Paths in areas likely to be explored should be improved for easy walking. Also, a clearly marked footpath should be established on-contour to connect the rustic rentals area to the old stone house to the southwest. Scoops and benches along the sides of paths will encourage guests to stay and connect in these unique places.

Consideration must be given to guests with varying levels of agility. Elderly folks or people with disabilities visiting the clubhouse area and a couple of the easily accessible stone house rentals should try to minimize the use of steps and steep paths so that one could easily get around and have access to everything necessary.

Parking

Although, many people will get to the site via taxis and shuttles, parking for guests will be available at some of the stone house rentals and near the clubhouse. Additional parking for employees will be at the maintenance area. There will also be a few parking spots for vehicles at the top of the hill to aid in projects taking place at the top.

Fencing

Fencing strategies will vary throughout the property in response to different needs.

The first type of fencing will need to protect young crops from marauding goats. Apparently it is not uncommon for a band of up to 100 goats to come roaming through the neighborhood. A large portion of the main property has already been fenced. This type of fencing should be extended around the entire agricultural area to the northeast. For some areas, like the chestnuts and woodlot, temporary fencing may be necessary when trees are establishing, but could be removed once the trees are mature.

Fences demand maintenance.

The second type of fencing is needed to protect chickens from predators. For this, we recommend a mix of poultry netting to reinforce their overnight enclosure and protection from raptors with portable electric fencing powered by a solar charger. This should keep most predators at bay for the safety of the chickens.

The third type of fencing is intended to keep people out of certain areas. This could be the same as the goat fencing. You might consider running this type along the road at the top of the property to keep out dirt bikes. You might also use this in areas you don't want guests to go (i.e. close to the beehives, humanure, etc.).

Existing paths and terraces express a long lived relationship with the landscape.

Intro

Several types of waste will need to be managed on the property. Many of these will be rolled back into the other systems on the property to fuel growth and further development. This section specifically deals with trash, recyclables, organic waste, human waste, greywater, and toxics.

For most of these wastes reduction is the first step. Minimizing the amount of non-recyclable, non-organic trash and toxic materials will mean less stuff that needs to be hauled away from the site for processing.

Organics

Organic waste falls into a couple common categories: food waste, crop residues, and humanure. Food waste should be collected in each unit/kitchen in ~ 2 liter containers which can be collected by housekeeping and delivered to the agroecology center for composting.

This will help to drive fertility for the crops being produced.

Crop residues can be composted onsite near the point where they were generated. Large baskets can contain piles of food waste, crop residues, leaf mold etc. Mixing these with an appropriate balance of Carbon and Nitrogen sources will produce rich, healthy organic compost to spread back into these same areas. This will minimize the risk of disease spread. For some crop residues it may be more appropriate to just lay them on the surface of another crop as a mulch rather than formally composting them.

Portable compost cages.

Trash & Recycling

Given the hospitality aspect of this project, some amount of trash and recycling will be brought in by guests. Also, supplies from some vendors may not be available in reusable containers. This is unavoidable. These items will have to be taken to the closest transfer station.

Toxic materials should be avoided as much as possible. Providing non-toxic products for guests and residents will help to maintain functional on-site waste processing systems. Guest education at the time of booking may also help with this. Again, some toxics will be unavoidable (i.e. automotive fluids, industrial chemicals and sealants, gasoline, etc.), but should still be minimized and use should be concentrated in the maintenance area. Spills may be treated with woodchips innocculated with fungal mycellium.

A branched greywater system irrigates trees from the kitchen sink.

Greywater

Greywater should be managed in a decentralized fashion. Each structure should have its own branched drain system that feeds mulched basins. These basins are filled with mulch (wood chips are ideal) and the water level never comes above the top of the mulch. In this way, the mulched basin system avoids breaking one of the cardinal rules of greywater: no surface greywater. The other cardinal rule is: no greywater storage. All of the sinks and baths should have their water go directly to the branched drains and basins. Storage of greywater for use in a dry period might sound like a good idea, but it tends to heat up, stink, and breed pathogens as it sits. Upon entering the mulch basin, soaps and organic materials are broken down by microorganisms and the water percolates into the ground where it can meet landscape irrigation needs. Each branched drain system should be sized to accommodate expected use in each area of the property.

Using greywater-compatible soaps and body products will be important to keep the system functioning. These should be provided in each room. If soaps and detergents contain too much sodium you run the risk of salting your soils. This is especially an issue in alkaline soils, but is somewhat counteracted by the heavy rains in the winter. Either way, no toxic stuff should go down the drain as it will kill the microorganisms that are supposed to do the work for you.

Humanure

Humanure, or human manure, will be handled differently in different parts of the property. Regardless of the management, the idea will be to maximize the ability to tap into the fertility in humanure and putting it to use in the landscape.

Constructed Wetland

In the clubhouse and stone house rentals, there will be normal flush toilets. This will accommodate the experience expected by the users. These toilets can utilize water from the ag system. Behind the scenes, rather than a cesspit or septic system, each cluster of stone houses and the clubhouse will have a small engineered wetland wastewater treatment system. When a toilet is flushed the effluent will flow downhill to a settling tank. The water will go into a wetland cell, a lined trough or container filled with gravel. The microorganisms growing on the gravel will help to break down nutrients and kill pathogens. Then plants growing in the gravel will take up those nutrients. Water coming out the other end of the system can be used for irrigation and biomass generated in the wetland cell can be used as mulch or composted. The plants selected can be chosen not only for their ability to filter blackwater, but also for their ornamental value. Solids from the settling tank can be taken and composted in the same way as the material from the composting toilets. For the construction specifications and sizing of these systems we recommend connecting with an engineer.

A thriving constructed wetland.

For the clubhouse, this wetland will be directly downhill from the parking area. That will allow effluent from existing toilets to get there via gravity, while also allowing the water coming out to be used lower in the landscape. For the construction specifications and sizing of these systems we recommend connecting with an engineer.

Composting Toilets

There will be composting toilets installed n the rustic rentals, volunteer villa, maintenance area, and any outbuildings. A good design here would be a raised dais to sit on with a large drum placed underneath. The drum should be easily accessible from outside. Next to each toilet there should be some sawdust or other carbon rich material that can be used to cover each person's deposit. When a drum is full, housekeeping or maintenance staff can lid it, wheel it away with a hand truck, and replace it with an empty drum. The full drums can be taken to a nearby area and let sit for composting for 1-2 years. Again, guests will need to be educated about what they should and should not throw into the toilet. Whoever is in charge of the humanure composting process should be well trained and have good attention to detail (time, temperature, aeration, solarization, etc.). See the Humanure Handbook by Joseph Jenkins for more information. Once the humanure is composted it can be used to boost fertility and condition soils in the woodlot or ornamental landscaping.

Composting toilet systems designed for small communities.

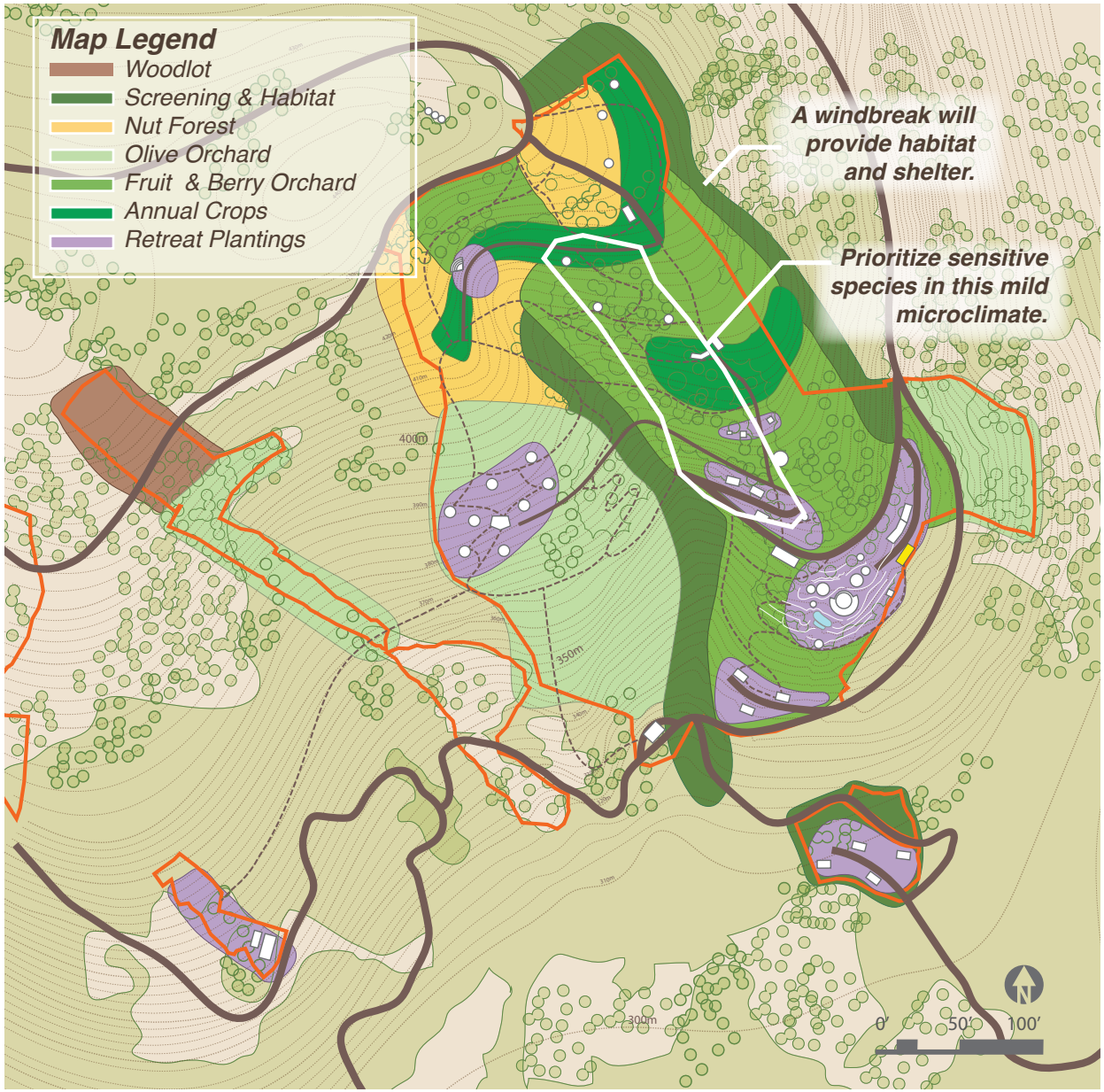
In addition, the composting toilets will be outfitted with urine diverters. These separate the urine from the feces when using the toilet. They can also be linked to a urinal for men. The urine can be integrated with the greywater system and routed to the same mulch basins to allow the nitrogen to directly benefit plants in the landscape.

Intro

When considering landscape decisions a few key features drive decisions. First, the Mediterranean climate, with its dry, hot summers and cool, rainy winters will favor some species and rule out others. The alkaline, relatively poor soils will also play a role in species selection. Finally, pest pressure will guide crop and landscape recommendations.

The landscape zones of the property breakdown into three major areas: the retreat, the production area, and the areas left for wildlife. The landscape of the retreat center will be focused on ornamentals, snack fruits, and educational plantings. The production landscape will supply as much fuel, fiber, food, fodder, and medicine for use on the property as possible. The remaining areas will be dedicated to supporting a rich, diverse panorama of wildlife.

Landscape Patterns Map



Snack Fruit

Planting delicious snack fruits encourages casual foraging throughout the area where guests and visitors spend the majority of their time. Species here have been chosen to delight people as they explore the property. Their ornamental characteristics as well as their potential for fresh eating will make for a rich and unique guest experience.

Selected Species

- Chilean Guava *Ugni molinae*
- Pineapple Guava *Acca sellowiana*
- Jujube *Ziziphus jujuba*
- Jelly Palm *Butia capitata*
- Loquat *Eriobotrya japonica*

Educational

Selected plantings in the retreat area will be accompanied by interpretive signage. These will include snack fruit species from the list as well as samples of the other species being grown in the production part of the property. This signage will educate interested visitors and enhance their understanding of the unique characterisitcs of Ahamtouli and the potential of greener living.

Selected Species

- Chilean Hazel *Gevuina avellana*
- Prickly Pear *Opuntia ficus-indica*
- White Sapote *Casimiroa edulis*
- Cherimoya *Annona cherimoya*
- Avocado *Persea americana*


Fresh & yummy Pomegranates.


The stone rental houses will resemble a traditional Greek villa in a pleasant Mediterranean orchard.

Fragrant

Throughout the retreat areas should be strategically placed fragrant flowers. Some species of fragrant flowers give their scent all day long. These can be strewn throughout the public areas. Other species release their fragrance at night. These could be placed to the windward side of structures and seating areas used in the evening. Regardless, the entire area should allow for one to explore a variety of aromatic treats.

Selected Species (Bloom Time)

- Night-Blooming Jessamine (PM) *Cestrum nocturnum*
- Natal Plum (AM) *Carissa grandiflora*
- Asiatic Jasmine (PM) *Trachelospermum asiaticum*
- Lemongrass (All Day) *Cymbopogon citratus*
- Mock Orange (AM) *Pittosporum tobira*

Ornamental

Finally, the retreat area will be loaded with beautiful ornamental plants. These will be selected primarily for their contribution to aesthetics, but also for their ecological functions, such as nitrogen-fixation and support for pest predator insects and birds.

Selected Species

- Sacred Flower of the Andes *Cantua buxifolia*
- Tree Lucerne/Tagasaste *Cytisus proliferus*
- Sages *Salvia spp.*
- Chinese Tallowtree *Triadica sebifera*
- Chilean Wine Palm *Jubaea chilensis*

Annual Crops

Several full-sun areas of the property will be set up to focus primarily on production of annual crops. These areas should all be on relatively flat terraces (the wider, the better). These will be the areas of most intensive fertility management and nutrient cycling. The annuals produced here will be used to feed guests and visitors first and foremost. If there is surplus it can be sold through markets in the local community.

These areas will feature tool storage and on-site composting for crop residues. Some of these areas will also be outfitted with greenhouses and screenhouses. The greenhouses will allow for winter production of vegetables for those still around. The screenhouses will provide protected places to grow produce during grasshopper season. As a side benefit, the screenhouses also minimize frost damage, protect crops from wind, and hold heat overnight. All annual cropping areas should be accessible by small utility vehicle or pickup truck.

Fruit Orchards

Much of the property is slated to be orchards and tree crops due to the steep nature of the landscape. These plantings are mixed species polycultures to minimize pest pressure and provide a diversity of products. The orchards closer to the main hubs of activity are planted with fruit that is harvested for fresh eating and brought to the kitchens for use. The orchard areas further from development can be used to grow storage crops and processing crops that get harvested all at once. For instance, soft fruits such as blackberries, raspberries and elderberries can be planted as rows between young fruit trees around the rentals while keeper apples and pears, prunes, apricots, and persimmons for drying are planted further away.

The existing vineyard at the top of the hill which should be enhanced and transitioned into organic practices. The other place to consider for a vineyard is just below the main agriculture campus (near the wind generator). These vineyards can produce large crops of both table and wine grapes.

Selected Species

- White Sapote
  Casimiroa edulis
- American Persimmon
  Diospyros kaki
- Asian Pear
  Pyrus pyrifolia
- Japanese Plum
  Prunus salicina
- Fig
  Ficus carica

Olives

Much of the property is planted with legacy olive orchards. The best looking olive plantings have been highlighted on the map. The first priority is to renovate via pruning, disease management and boosting fertility by moving chickens through the groves. During this process, assess the quality of the olive trees as many of these are really old and new varieties are available. When it makes sense, don't hesitate to topwork trees, especially younger ones, over to new varieties with the specific desired characteristics, especially any disease resistant varieties.

Since nearly all neighboring properties have olives that are either unmanaged or managed conventionally, there will always be pest and disease pressure on Ahamtouli. Explore organic growing and cultivation techniques used by local organic growers such as Theotoky Estate and Bioporos.

A healthy olive planting on-site.

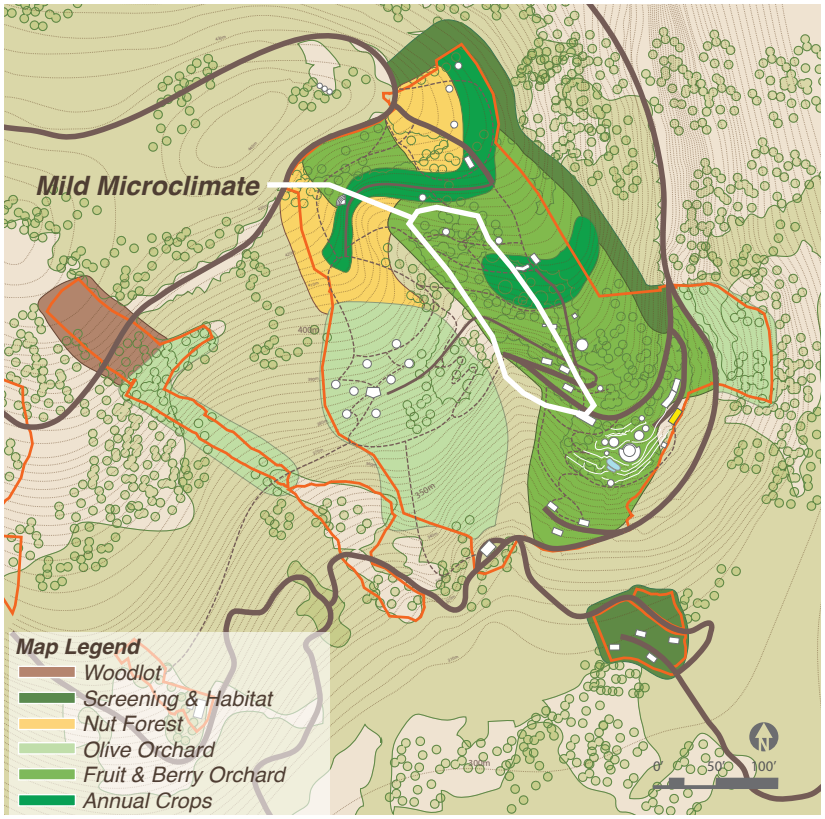
The Agroecology Center is characterized by terraced gardens, hoophouses and outdoor living.

Nuts

The areas designated as nut groves are steep, rocky, and far from most development. Many of them area already well on their way to becoming mixed oak/chestnut groves. These are areas that will require minimal maintenance aside from harvest. Yet, they have the potential to produce a huge amount of calories.

Selected Species

- European Chestnut
  Castanea sativa
- English Walnut
  Juglans regia
- Italian Stone Pine
  Pinus pinea
- Bunya Bunya
  Araucaria bidwillii
- Filbert/Hazel
  Corylus avellana



Windbreak

Wind is one of the major elements that drives this design. Much of the property receives some protection from the ridge topography, however, other parts are exposed to strong, cold winds from the north (although the wind can come from almost any direction). A windbreak has been placed on the northeastern property line since this is the direction of the damaging winter winds.

This windbreak is not just a simple line, but rather a layered batch of trees of differing heights. Several rows of trees form a more resilient windbreak since a single dead tree will not result in a failed system. By putting the lowest plants on the windward side and gradually building height as you move toward the lee, the wind will be gently lofted over the windbreak to touch down a hundred meters or more away. Planting in this fashion should minimize the risk of turbulence.

The windbreak will consist of specific species that are well adapted to the physical and drying effects of wind. The species list in the appendix provides appropriate selections broken into short, medium, and tall categories.

Woodlot

The woodlot area is intended to supply woody material for a variety of purposes. The primary use for wood is firewood. Small woodstoves used to heat small spaces should be a good match for small-diameter coppice firewood production. This involves planting hardwood species that will grow back after you cut them. Then, after several years of growth, you can cut the new material and repeat. This is called coppicing. Managing the woodlot this way makes a lot of sense in such a steep landscape as you will always have a living root system in the ground.

In addition to firewood, poles for garden use and tool handles can be grown. It is also possible to grow a small patch of high-value full-sized trees for long-term lumber production to rebuild infrastructure in the future.

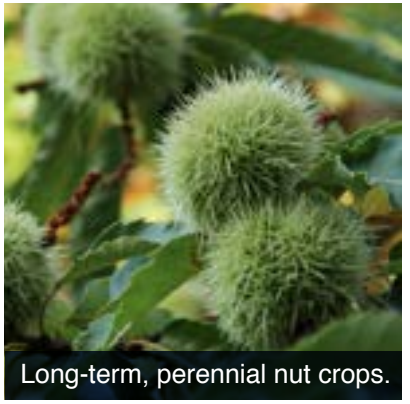

Renewable heat & cooking fuel.

Mild Microclimate

This area of the property is particularly mild and may support species not usually hardy in these conditions. The slope is sunny, south facing and protected from cold northern winds. Finally, it is close to the rema, so cold air should drain away, leaving this area warmer than its surroundings.

This band of mild conditions crosses through the retreat, agroecology center, and liminal spaces. Placing showy species along pathways and near to the retreat, will ensure they are enjoyed by visitors.

Several exciting species may succeed here including; Cherimoya, a fruit with a vanilla custard flavor; Avocados; Macadamia nuts, a delicious, high-value crop and Babaco, a tasty subtropical papaya species.


Long-term, perennial nut crops.

Habitat

The landscape of Corfu has been heavily impacted by humans for thousands of years, leading to minimal wildlife habitat. One step to having a more thriving ecology is to re-establish good wildlife habitat so that animals can find sanctuary. The rema, which is already fairly wild, will be a great place to improve the landscape for wildlife. At some point in history the rema likely ran with water, at least periodically. That means it would have traditionally been a place for wildlife to migrate and find shelter. By allowing the forest to regenerate and focus on removing harmful species (such as English Ivy) this area could once again be a place where animals can meet their needs.

The southern stone house rentals can also be surrounded in habitat plants. They are far away from the rest of the agricultural scene, so it will be easier to manage with habitat plantings rather than production crops. The windbreak will also provide good wildlife shelter.

Throughout the property there will be habitat ponds to accommodate excess water from the catchment systems at each cluster of dwellings. These will supply a much needed water source that will allow all manner of wildlife to thrive. If mosquitoes are a concern, the ponds could be stocked with small mosquito-eating fish such as gambusia or fathead minnows.

All habitat areas can be enhanced with plantings of native Corfiot species. Identification of rare species that would fit the conditions at Ahamtouli should be a priority.

Plantings can attract pollinators, pest-predators and other attractive insects.

Management

With all the benefits that wildlife can bring, it is also important to recognize that wildlife in the wrong place at the wrong time are what we call pests. One major pest that will require management is the grasshoppers. They ravenously attack vegetables and other plants in the early summer. Screenhouses will help to minimize damage during the prime grasshopper season. However, crop selection may be a primary strategy. Crops become established and/or produce outside grasshopper season will avoid the problem altogether. Exploring resistant crops (those unpalatable to grasshoppers) is also a good idea. Anything you do to improve habitat for birds and pest predator insects will also help to address the grasshopper issue. Finally, explore options for biocontrol of grasshoppers using a fungus called Nosema locustae.

The native Hermann's Tortoise.

Poorly managed goats roaming the hillsides certainly aren't wildlife, but they can be pests if not considered. The best way to deal with the roaming goats is to fence critical planting areas in blocks and use individual tree cages for establishment where this isn't feasible. See more details in the fencing section.

Traditionally, hunters have accessed the property, likely in search of birds such as partridges. Just telling them to keep out may not work and may cause bad feelings. Instead, try reaching out to the hunting community and explaining that you'd like the property to be a wildlife sanctuary. If the animals can safely find shelter and food they may also breed at Ahamtouli. That will mean more animals and better hunting on all the surrounding properties.

Fire Management

Hot, dry summers demand fire management strategies. Reduce fuel loads and "fire ladders" by removing the small woody shrubs that can carry flames up into the crowns of trees. Where there are lots of older shrubs, cut them down, chip them, and spread the wood chips on the ground. This builds soil, improves water retention and lowers fire risk. A tractor with a PTO wood chipper would be ideal for this scale/property.

Maintain all sizeable roads as clear firebreaks with minimal woody vegetation nearby. Along these firebreaks, and throughout the property, fire-resistant plantings of cactus, yucca, and agave will slow down threatening fires.

A specialized portable fire pump moves huge volumes of water quickly and having one or two of these in the maintenance area will give you the ability to fight a fire wherever it occurs.

Finally having clearly defined smoking areas and supporting staff who confront people who are smoking elsewhere will help minimize the risk of a cigarette butt setting the hillside ablaze. Fire pits are a similar threat and may be off limits during exceptionally dry periods.

Fertility Management

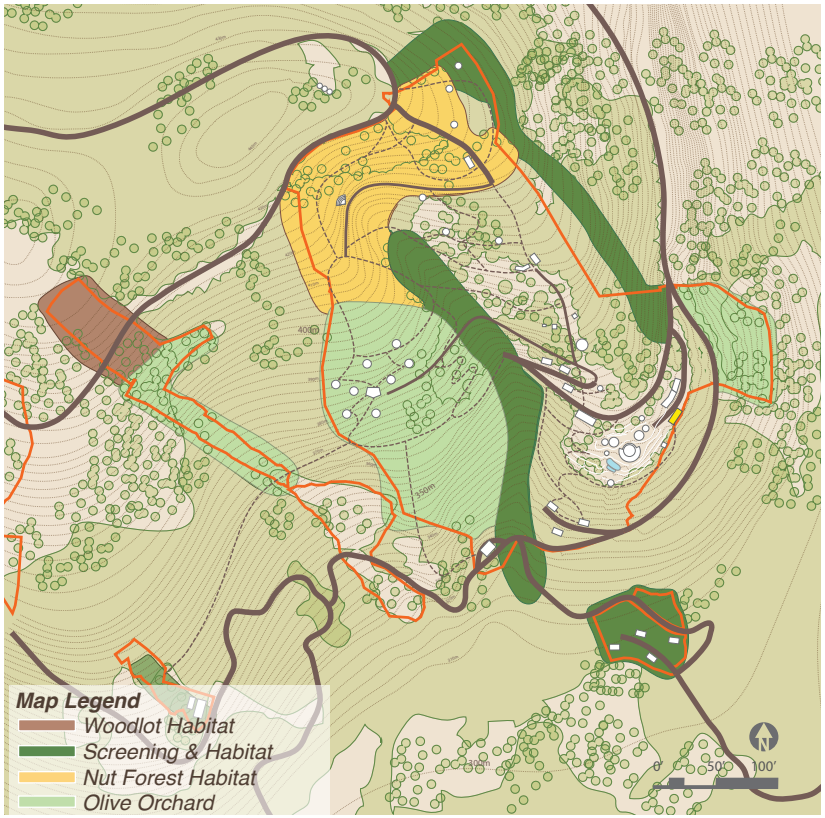
The stone terraces lining the landscape have done a great job of slowing soil erosion and preventing nutrient loss. Maintain these terraces and organize plantings on contour to improve their functionality. Vetiver grass (Chrysopogon zizanioides) can be planted in bands where stone walls are impractical. Mulching terraces will also minimize the impacts of heavy rain.

Nitrogen-fixing plants can also be used to boost fertility throughout the site. Plant the shrub tagasaste/tree lucerne (Cytisus proliferus) as winter cover and in the spring, cut the tagasaste to the ground. This opens up light for crops and releasse nitrogen into the soil. Chip the cut material and use it for mulch on the terraces. This fertility management technique is called “chop & drop.” It can be used with other nitrogen-fixing perennials throughout the site as well in annual cropping systems.

Whenever soils are loosened up, sow nitrogen-fixing ground covers to collect nutrients and minimize erosion. Birdsfoot trefoil, clover, lupines, and alfalfa/lucerne are good choices for this. See the appendix for a full list of nitrogen-fixers.

Begin planting large roots and tubers to break up compacted soils, aerate and increase organic content. Daikon radish is an excellent choice, as are mangel beets, jicama, burdock, and yams.

Nutrient cycling will occur in several different ways on the property. Chickens eat weeds, insects, and crop residues and convert them into nutrients for the crops. Crop residues can also be composted and reapplied. Nutrients from humanure and biomass generated by the engineered wetland wastewater treatment systems can be safely composted and applied to tree crops or used as mulch for perennials.



Establishment

The dry summer and relative infertility will provide challenges getting vegetation established. Avoid the worst effects of the drought by not planting in the summer. Ideally, most things will be planted as the autumn rains begin. Soil gels, mulching, drip irrigation and increasing the organic matter content of the soil will improve fertility and water retention during establishment.

Several wild trees on site may serve as good rootstock for excellent orchard crops. Some specimens have already been grafted by local horticulutralists and need additional care during the first few years.

Nursery

To ensure the success of new plants, set up a small holding nursery near the clubhouse kitchen and hub of activity. This is a space to store and care for potted plants and is a key component of site development. Once these are planted out, this space can remain as a small nursery or be planted. A more sizeable propagation nursery will be located in the Agroecology Center, with good sun, access to water and staff attention. By growing your own plants, you can improve their chances of success, dramatically reduce costs and trial new varieties.

Livestock

The most prominent livestock on the property will be chickens, managed in two different groups. One or more large flocks of *Working Chickens* will range in the agricultural areas cleaning up fallen fruit, eating pests, crop residues and weeds, and fertilizing. Chicken tractors and/or portable electric fences will keep them contained and protected. These chickens will also supply eggs and meat.

A small flock of *Pet Chickens* will live in the existing chicken coop, relocated near the owners home.The Rustic Rentals area will provide more protection than their current siting. These chickens can free-range all day and get penned at night.

Bees will also be kept on-site and should be concentrated into one or two areas for ease of management. Inter plant the landscape with bee-fodder flowers, selected to bloom at different times of the year to ensure healthy hives. Provide signage near the hives for potential allergic visitors.

Intro

Sustainability doesn't stop with the physical site, but also carries through to the various aspects of social organization of the project. This includes setting up a system of governance and decision-making, figuring out staffing, and integrating the educational aspect of the project.

Governance

Governance includes policy- and decision-making strategies, accountability, priority-setting, and overall visioning. All projects (businesses, organizations, families, nations, etc.) have governance systems, whether explicit or not, that guide what happens to varying degrees of success. Ahamtouli is a multi-faceted project with diverse components including businesses, an education organization, and a residential community. For each of these things a governance system called sociocracy or dynamic governance is worth researching.

In particular, there are a few aspects of sociocracy that could really help Ahamtouli to thrive:

Doubly-linked Circles:
Sociocratic organizations are organized into circles. For instance, there may be a circle for housekeeping, a circle for retreat landscaping, a circle for marketing, etc. Each of these circles would be comprised of several individuals who would be working on related issues. Each of these circles would fall under a more general circle. For instance, the retreat landscaping circle might fall under the purview of the land management circle, which also steers the water systems circle, the energy systems circle, the agriculture circle, etc. Each circle elects a person from within their ranks to represent them at the next higher circle. Conversely, higher circles can choose who they want to represent them in a lower circle. This is double-linking. It allows for a person on the ground to be able to allow their wisdom to reach the people at the top of the hierarchy, which is seldom the case in conventional business models. This means ideas are drawn from a much broader range of minds.

Governance *(cont'd)*

Consent-based decision-making:
Not to be confused with consensus, consent-based decision-making allows decisions to be made efficiently, but with a greater range of input. One aspect of consent-based decision-making is that proposals have a timeframe for review. Thus, once a decision is made measures will be taken to see if it is actually working as intended. It can be changed if it is not working. By having this timeframe built into the proposals, less people tend to object to trying new ideas. Tha means projects can move forward quicker, while still receiving the benefit of feedback that is crucial to honing a new proposal.

Measuring Success and Sharing Benefit:
Sociocracy uses defined measurements to determine the success of a proposal. When that proposal is successful (i.e. the business is making more money, the crops are producing more food, etc.) the profits are shared amongst those who proposed and implemented the idea. If a proposal is unsuccessful, that too is felt by those directly involved with it's implementation. This incentivizes people to do more than just show up for work. Rather, they do everything in their power to do what is in the best interest of the organization and make things work. If Ahamtouli benefits, so do they.

Sociocracy is used by a number of businesses throughout Europe and by the US Green Building Council. It maintains the productivity and action-oriented benefits of hierarchical organization, while allowing voices to be heard at all levels of that hierarchy. Should sociocracy be of interest, the book We the People: Consenting to a Deeper Democracy by John Buck and Sharon Villines is a good primer. Working with a consultant would probably also be beneficial.

Simple, sturdy housing will be a key part of the Agroecology apprenticeship.

Staffing

Ahamtouli will only be as successful as the people who run it. Finding appropriate staff members with the right skills sets will be critical to success for all aspects of the project.

All staff will need to have a higher level of understanding of the site at Ahamtouli than a usual hotel staff. For example, they will need to know about the greywater/blackwater systems so they never dump toxic cleaning products down the drain. Landscaping staff will need to be versed in organic techniques. Ideally these staff members, likely locals, will have a means of asking questions and making recommendations that will be heard by management.

Investing in training is the best way to ensure everyone from project managers to chicken wranglers understands how systems at Ahamtouli work. This permaculture master plan deviates strongly from standard ways of doing business. It will require special skills to make it work and those skills will need to be provided. Invest in people so that they can make the best of the landscape with which they are working.

One or more critical positions will need to be filled by permaculture project managers. From experience, Terra Phoenix Design has learned that the people with the skills and the availability to do this job are few and far between. Therefore, we recommend focusing on people with a good grasp of permaculture basics and good energy and support them to fill in the gaps with training. Essentially, you may need to develop-WW your own project manager. Depending on the person, skills that may need developing could be Greek language, budgeting and finance, advanced water system training, advanced construction training, etc.

For these staff to stick around they will need to feel that they are empowered to do their job without being micromanaged. Of course people need to be on-board with the overall mission and values of the project. However, they also cannot be micromanaged by those above them. Specific training for managers in successful accountability strategies would be beneficial.

Shaded amphitheater seating will serve as a venue for workshops, concerts and special events.

Staffing

In addition to internal trainings for staff members, the agroecology center has a mandate to educate interns and, possibly, course participants. To accomplish this there will need to be some sort of formal apprentice/internship program. That will require people with skill sets in both land management and teaching. There will need to be several full-time staff members living on-site whose primary job it is to work with interns. Teaching and accomplishing tasks simultaneously will be a major task. Four to six staff members should be able to manage a crew of up to 30 interns and visitors who are there to contribute and learn. It may also be advisable to organize an intermediate level of participants. For instance, one might start as an intern for a year. Then they might decide to return as an apprentice instructor, managed by a staff member and organizing work groups of interns. Make sure not to neglect advanced educational opportunities and trainings for the staff and apprentices. These opportunities for personal development in tandem with a good balance of autonomy/guidance and fair compensation will hopefully lead to people making long-term commitments to Ahamtouli.

Intro

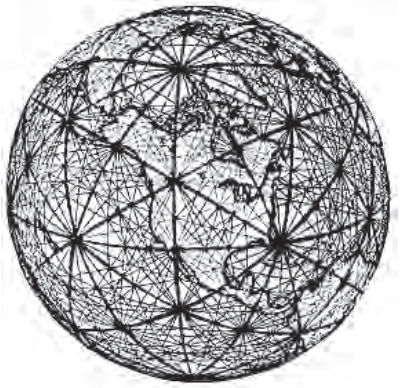
During the Terra Phoenix team's visit to Ahamtouli they had the opportunity to meet geomancy consultant, Christian Kyriacou. Much of the following information is based off of his time map dowsing and exploring the subtle energies on the property. Here is a collection of things he observed.

Geomancy

The accompanying map was produced by Christian during his visit. He identified the overlaying grids of Hartmann lines and Curry lines (both types of subtle earth radiation). Wherever there were confluences of lines there were likely to be concentrations of earth energy. For each of these vortices Christian identified whether they had yin energy, which would be detrimental for settlement or daily activities *(referred to as being "geopathic")*, or yang energy, which would have an uplifting effect. As he went through the map and dowsed each vortex he found that they all had beneficial yang energy in areas where development was planned. The few yin vortices were all in locations where no major structures or activities were to be concentrated.

One particular vortex with particularly strong yang energy was located just below the clubhouse. This may be a particularly good spot to set aside as a sacred location for meditation and other spiritual pursuits. Perhaps its yang effect could even be augmented by surrounding the area with the right crystals or basalt stones.

New Buildings are to be located on or off power spots depending upon their function. Their specific design should reflect sacred geometry and geomantic principles.



Global Geomantic forces.

Landscape Energies Map

Potentizing Water

To enhance the vibration of the whole landscape several aspects of the water system can be modified. When constructing any of the cement/concrete water tanks or pools on the property, the concrete can have some of the water (say 10%) "potentized" with quartz crystals using the biodynamic method (preparation 501). This should make a hard, dense concrete or cement mix that will be stronger and also bring in stellar/solar energy.

Crytals imprinted with energy.

Additionally, in any of the water tanks or cisterns, some crystals or semi-precious stones (such as quartz or amethyst) can be submerged in baskets. They can also be added to the slow sand filter, as a sprinkle on top of the sand. This will get all the water that is used for irrigation and domestic use charged up a little bit with cosmic energy. Before using these crystals and semi-precious stones, they should have their energy cleared first. Once cleared, the crystals/stones could be charged during meditation and filled with love, abundance, gratitude, or any positive emotions/energies before they are put in place.

Entheogens

Entheogens are substances, usually plant-derived, that allow people to experience a non-ordinary state of consciousness. This is how many people gain spiritual insight and access deep healing that would be difficult, if not impossible, without these helpful plant medicines. Many plants are used for this purpose around the world. The following species list includes some that would be well adapted to growing at Ahamtouli (check local laws first).

Selected Species

San Pedro
Echinopsis pachanoi
Diviner's Sage
Salvia divinorum
Aztec Dream Herb
Calea zacatechichi
Peyote
Lophophora wiliamsii
Syrian Rue
Peganum harmala

A potent spiritual plant ally.

The Master Oak

Christian also identified the location of the "Master Oak" on the property. The spirit of this oak has somewhat of a guardian role for nature spirits on the property. Interestingly, this tree was also highlighted by Alekos during an early exploration of the property. As such, this particular tree should be protected and integrated into major seasonal, honorary ceremonies.

Phased Project Development

The following implementation plan makes the seemingly large list of things-to-do more accessible. The long-term vision illustrated in your conceptual design is a valuable roadmap for where you are going and an essential tool for project development.

The following “trees” show the phasing for each part of the project and insure that all the necessary pieces for a given task are in place before that task is undertaken. This method of phasing allows the design to move forward on different fronts depending on the resources and expertise available at the time.

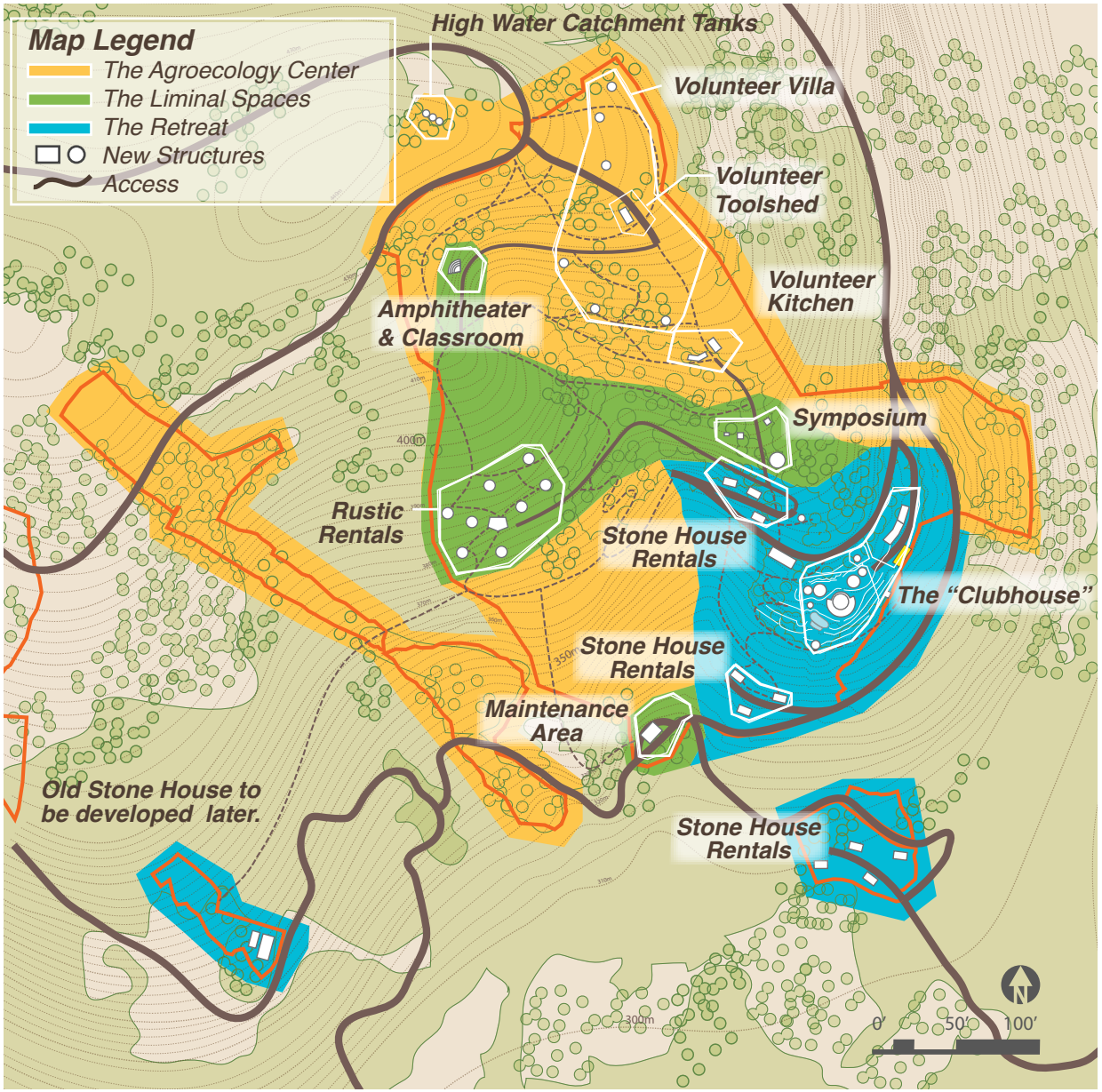
As with all good designs, this plan should remain flexible. Some of these tasks will change priority over time. Lessons from the development process may add or subtract tasks from the list. Feel free to move things around. Just be logical of where you move things so you do not find yourself making costly errors *(like planting things out before you have the irrigation systems in place to water them)*.

Also note that there are no specific time frames attached to any of the phases. The whole process could take a variable amount of time depending on budget, resource availability, and knowledge acquisition. Therefore, these phases should be looked at as a logical approach, not a hard-fast calendar.

THE RETREAT

PRIOR TO DEVELOPMENT	PHASE I	II	III	IV	
STRUCTURES & INFRASTRUCTURE					
Accquire Internal Parcels	Driveway for Low Stone Houses	Develop Lower Stone House Cluster	Develop Upper Stone House Cluster	Develop Cypress Stone House Cluster	Rennovate Old Stone House
Accquire Water Tank Parcel					
Accquire Maintenance Parcel		Build Maintenance Area	Build Rustic Rentals		
Develop Road to Upper Stone Houses & Rustic Rentals	Build Clubhouse Developments *(Treatment Rooms, Exercise Space, Expand Parking, Storage beneath Solar Array, Entry Experience, etc)*	Build Playground	Build Symposium	Develop Amphitheatre	
	Wall & Terrace Repair				
	Develop Circuit Path				
ENERGY					
Imp Conservation Strats *(New Appliances, Signage, etc)*	Repair or replace Wind Generator	Install Propane Tanks during development of Stone House Clusters			
Auto Back-up Generator *(deisel or propane)*	Lift or Protect Solar Array			Rustic Rental Energy Systems	
Organize Energy Shed	Get Gator/Vehicle				
WATER					
Organize existing water system *(Inside of Water Shed)*	Build Cisterns prior to all building construction	Install greywater systems with each new kitchen/bath	Install Second High Water Tanks *(High parcel or Grapes)*		
Install First High Water Tanks *(High Parcel or Grapes)*	Install primary pump.	Install Maintenance Area Pump	Install Booster Pumps at Rustic Rentals & High Stone House Cluster		
Install Main Trunk Line	Install Constructed Wetland for Clubhouse	Install Constructed Wetlands during development of clusters			
Finish Clubhouse Collection System	Separate Clubhouse Greywater for Irrigation				
PLANTS & LANDSCAPE					
Maintain existing plantings with mulch and groundcovers.	Cut firebreaks	Install Retreat Plantings after cluster construction.			
	Upgrade Clubhouse Plantings	Educational Signage for Plantings	Site, Install, & Plant Habitat Ponds		
INVISIBLE STRUCTURES					
Explore Governance Models *(Sociocracy, Consensus, etc.)*	Begin searching for good Team Members both Locally and Abroad		Rent Lower Stone Houses	Rent Upper Stone Houses	
Ongoing training for Staff					

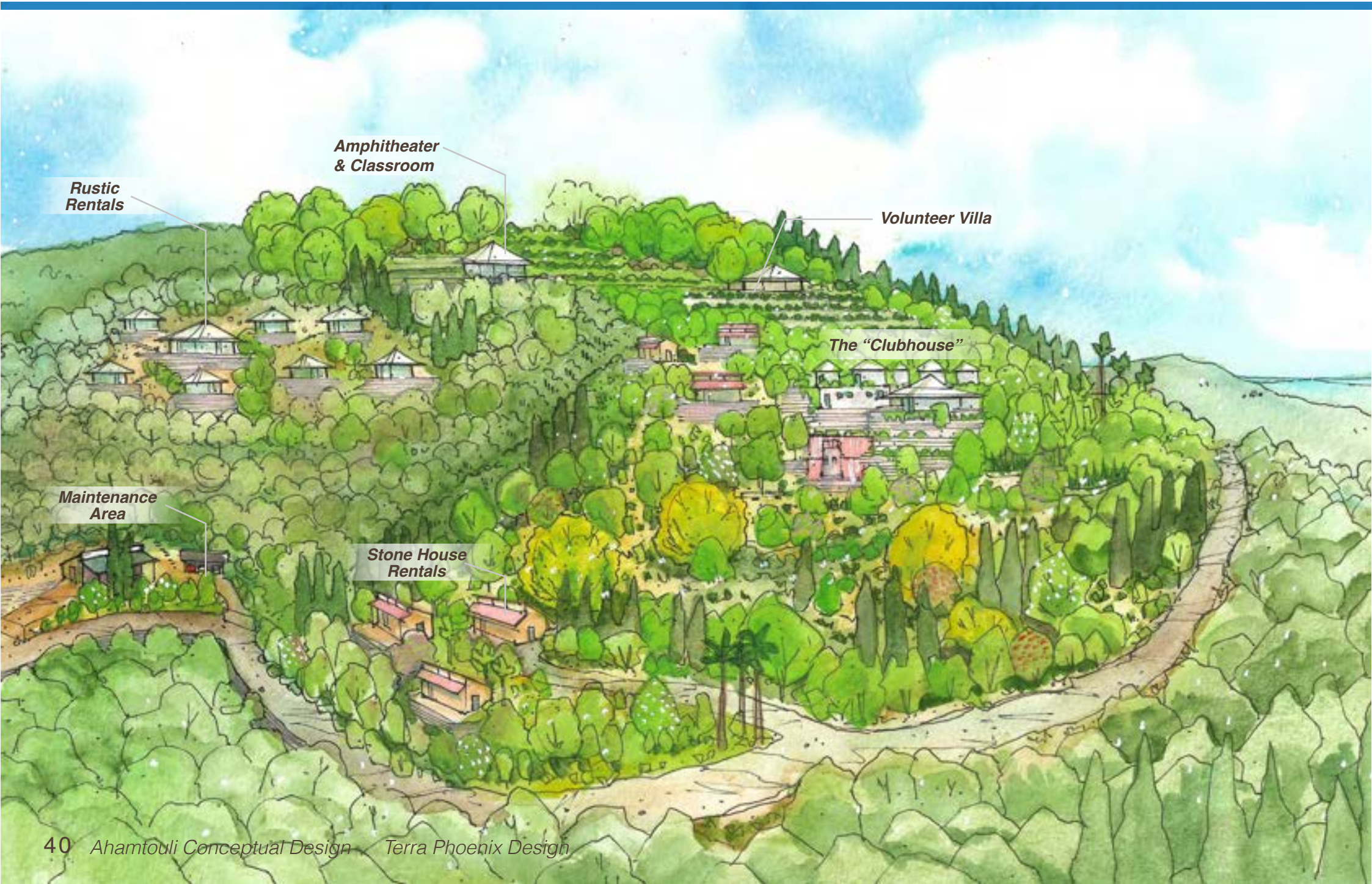
Concept Map



THE AGROECOLOGY CENTER

PRIOR TO DEVELOPMENT	PHASE I	II	III
STRUCTURES & INFRASTRUCTURE			
Footpaths Developed in conjunction with associated Elements	Build Volunteer Villa & Commons Infrastructure *(Kitchen, Bathhouse, Composting Toilets)*	Build Volunteer Housing	Build Symposium
Vehicle Access to Volunteer Villa Tool Shed	Build the Tool Shed	Build Green Houses & Screen Houses	Develop Amphitheatre
ENERGY			
	Install Commons PV System	Expand Commons PV System to appropriate Volunteer Housing	
			Develop independent systems for outlying Volunteer Houses
WATER			
Tie into Trunk Line for Irrigation & Potable needs.	Expand Drip Irrigation in conjunction with Plantings.		
	Install Greywater for Commons		
PLANTS & LANDSCAPE			
Maintain existing plantings with mulch and groundcovers.			
Build Fencing for Annual Terraces	Improve soils on Annual Terraces	Plant & Manage Annual Terraces	
Evaluate & reclaim healthy Olives	Establish Fruit Orchards	Maintain & Develop Fruit Orchards	
Graft Pisatchios, Pears etc.	Establish Nut Orchards	Maintain & Develop Nut Orchards	
Explore Grasshopper Resistant Crops	Plant Woodlots	Maintain & Develop Woodlots	
	Fence & Rennovate Grapes and Surrounding Area	Maintain & Develop Grapes and Surrounding Area	
	Habitat Improvement		
INVISIBLE STRUCTURES			
Ongoing training for Staff			
	Begin searching for good team members both locally and abroad	Seek Volunteer Program Staff	Outreach for Volunteer Program Participants

CONCLUSION


Amphitheater
& Classroom
Rustic
Rentals
Volunteer Villa
The "Clubhouse"
Maintenance
Area
Stone House
Rentals

CONCLUSION

Conclusion

From assessment to implementation planning, this document serves as a guiding hand in the development of a promising project at Ahamtouli. The information in this document will help to communicate the overall vision to anyone who wants more information. It will also be a valuable tool for communication between family members, residents, contractors, employees, friends, and students who must all be on the same page for the development of the project to go smoothly. Ultimately, following this plan will produce a fantastic model for sustainable development.

The next step in making this project reality is design development. This involves figuring out the details for the various pieces of the puzzle (e.g. sourcing plants and materials, laying out plantings in greater detail, designing buildings, etc.). Terra Phoenix Design will be happy to help with that process. As each puzzle piece comes into clearer focus through design development it can then be installed/ implemented, which is where the tires hit the road and the project begins to take on a life of its own.

Acknowledgements

Terra Phoenix Design would like to extend special thanks to Andreas Thrasy and Linda Kay Stevens for their kind hospitality and helpfulness during the creation of this plan. Big thanks also to:

Sophia Giannakopoulou for taking great care of us while we were in Corfu.

Alekos Giannakopoulou for helping us interpret what the land wanted to tell us.

Leo Nekaj for giving us a better understanding of how things get done on Corfu.

Terra Phoenix would also like to thank, in advance, all of the amazing change agents that will work on this project in the years to come. With the time, sweat, thought and energy you invest in this land, you will be cocreating a vision, far larger than any one of us.

Thank You.

Existing Species *(Fall 2016)*

Scientific Name	Family	English Name
Acanthus spinosus	*Acanthaceae*	Spiny Bear's Breech
Allium chamaespathum	*Amaryllidaceae*	Wild Onion
Arbutus unedo	*Ericaceae*	Strawberry Tree
Arundo donax	*Poaceae*	Giant Cane
Asparagus acutifolius	*Asparagaceae*	Wild Asparagus
Asplenium ceterach	*Polypodiaceae*	Rustyback Fern
Biarum tenuifolium	*Araceae*	Half Arum
Calicotome villosa	*Fabaceae*	Spiny Broom
Carpinus orientalis	*Betulaceae*	Oriental Hornbeam
Carthamus lanatus	*Asteraceae*	Saffron Thistle
Castanea sativa	*Fagaceae*	Sweet Chestnut
Cercis siliquastrum	*Fabaceae*	Judas Tree
Cistus spp.	*Cistaceae*	Rockrose
Clematis spp.	*Ranunculaceae*	Clematis
Colchium confusum	*Asparagaceae*	Autumn Crocus
Crataegus monogyna	*Rosaceae*	Hawthorn
Cupressus sempervirens	*Cupressaceae*	Mediterranean Cyprus
Cyclamen europaeum	*Primulaceae*	Purple Cyclamen
Cydonia oblonga	*Rosaceae*	Common Quince
Daucus carrota	*Apiaceae*	Wild Carrot
Digitalis laevigata ssp. Graeca	*Plantaginaceae*	Grecian Foxglove
Dioscorea communis	*Dioscoreaceae*	Black Bryony
Drimia maritima	*Hyacinthaceae*	Sea Squill
Echinops sphaerocephlus ssp. Albidus	*Asteraceae*	Globe Thistle
Euphorbia peplus	*Euphorbiaceae*	Petty Spurge
Ferula communis	*Apiaceae*	Giant Fennel
Ficus carica	*Moraceae*	Fig
Fraxinus ornus	*Oleaceae*	Manna Ash
Galium spp.		
Hedera helix	*Araliaceae*	Common Ivy
Lathyrus ochrus	*Fabaceae*	Winged Vetchling
Ligustrum vulgare	*Oleaceae*	Privet
Lonicera spp.	*Caprifoliaceae*	Honeysuckle
Lunaria annua	*Brassicaceae*	Money Plant
Nigella damascena	*Ranunculaceae*	Nigella
Olea europaea	*Oleaceae*	Olive
Opuntia spp.	*Cactaceae*	Prickly Pear
Paliurus spina-christi	*Rhamnaceae*	Jerusalem Thorn
Pallenis spinosa	*Asteraceae*	Spiny Golden-Star
Phlomis fruticosa	*Lamiaceae*	Jerusalem Sage
Pistacia lentiscus	*Anacardiaceae*	Mastic
Pistacia terebinthus	*Anacardiaceae*	Turpentine Tree
Prunus domestica	*Rosaceae*	European Plum
Prunus spp.	*Rosaceae*	Bitter Almond
Pteridium aquilinum	*Dennstaedtiaceae*	Bracken Fern
Pyracantha coccinea	*Rosaceae*	Scarlet Firethorn
Pyrus spinosa	*Rosaceae*	Willow-Leaf Pear
Quercus cerris	*Fagaceae*	Turkey Oak
Quercus coccifera	*Fagaceae*	Kermes Oak
Quercus ilex	*Fagaceae*	Holly Oak
Quercus ithaburensis	*Fagaceae*	Mt. Thabor's Oak
Rhamnus alaternus	*Rhamnaceae*	Mediterranean Buckthorn
Rosa sempervirens	*Rosaceae*	Evergreen Rose
Rubus sanctus	*Rosaceae*	Bramble
Ruscus aculeatus	*Asparagaceae*	Butcher's Broom
Salvia spp.	*Lamiaceae*	Sage
Smilax aspera	*Smilacaceae*	Sarsaparilla
Spartium junceum	*Fabaceae*	Spanish Broom
Verbascum graecum	*Scrophulariaceae*	Greek Mullein
Viburnum tinus	*Adoxaceae*	Laurustinus

Graftable Wild Species

Scientific Name	Common Name	Graftable Relatives
Pyrus spinosa	Willow-leaf Pear	Pears, Loquat, Medlar, Apples
Pistacia lentiscus	Mastic	Pistachio
Crataegus monogyna	Hawthorne	Euro Pear, Azarole, Quince, Mayhaw
Castanea sativa	Sweet Chestnut	Improved Chestnut Cultivars
Prunus domestica	Euro Plum	Plum, Peach, Nectarine, Apricot, Almond
Prunus spp.	Bitter Almond	Plum, Peach, Nectarine, Apricot, Almond

Prioritized Selections

Species in **Bold Font** are designated as the most productive, reliable and resilient species for the conditions at Ahamtouli. **These species should compose 70%-80% of all plantings.** Other listed species are very likely to thrive, but may not provide consistent yields.

Retreat & Residential Landscape

Snack Fruits

Scientific Name	English Name
Acca sellowiana	**Pineapple Guava**
Arbutus unedo	Strawberry Tree
Aronia melanocarpa	Chokeberry/Aronia
Berberis aristata	Nepalese Barberry
Berberis darwinii	Darwin Barberry
Billardiera longiflora	Tasmania Vine
Butia capitata	Jelly Palm
Cornus kousa	Chinese Dogwood
Cornus mas	Cornelian Cherry
Decaisnea fargesii	Blue Sausage Tree
Elaeagnus multiflora	Goumi
Elaeagnus pungens	Silverberry
Elaeagnus umbellata	Autumn Olive
Elaeagnus x ebbingei	Hybrid Silverberry
Eriobotrya japonica	**Loquat**
Ficus carica	**Fig**
Gaultheria shallon	Salal/Shallon
Leycesteria formosa	Himalayan Honeysuckle
Lonicera caerulea	Honeyberry
Lycium barbarum	Goji /Wolf-Berry
Mespilus germanica	Medlar
Morus alba	**White Mulberry**
Opuntia spp.	**Prickly Pear**
Passiflora mollissima	Banana Passionfruit
Prunus armeniaca	**Apricot**
Prunus avium	Sweet Cherry *(semi-dwarf & low-chill)*
Prunus domestica	**European Plum** *(semi-dwarf)*
Prunus dulcis	Almond
Prunus persica	**Peach** *(semi-dwarf)*
Prunus salicifolia	Capulin Cherry
Prunus salicina	**Asian Plum** (semi-dwarf)
Rosa rugosa	Rosa Rugosa
Rubus × loganobaccus	Loganberry
Rubus fruticosus	Blackberry
Rubus idaeus	**Raspberry**
Rubus 'Marionberry'	Marionberry
Rubus parviflorus	Thimbleberry
Rubus pentalobus	Emerald Carpet Raspberry
Rubus 'Tayberry'	Tayberry
Rubus ursinus × idaeus	**Boysenberry**
Ugni molinae	**Murtillo/Chilean Guava**
Vitus spp.	**Grape**
Ziziphus jujuba	**Jujube**

Ornamentals

Scientific Name	English Name
Campsis spp.	Trumpet Vine
Cantua buxifolia	Sacred Flower of the Andes
Chaenomeles spp.	Flowering Quince
Chamaerops humilis	Mediterranean Fan Palm
Cytisus proliferus	**Tagasate/Tree Lucerne**
Eucalyptus ficifolia	Red Flowering Gum
Gevuina avellana	Chilean Hazel
Jubaea chilensis	Chilean Wine Palm
Luma apiculata	Orange Bark Myrtle
Metrosideros excelsa	New Zealand Pohutukawa
Salvia spp.	Sages
Triadica sebifera	Chinese Tallow Tree
Washingtonia filifera	Desert Fan Palm

Fragrant Plants

Scientific Name	English Name
Carissa grandiflora	Natal Plum
Cestrum nocturnum	Night-Blooming Jessamine
Chrysopogon zizanioides	Vetiver
Cymbopogon citratus	Lemongrass
Pittosporum tobira	Mock Orange
Rosa spp.	Roses
Trachelospermum asiaticum	Asiatic Jasmine

Vegetable Terraces

Grasshopper Resistant Varieties

Experimentation with these will present the most effective selections.

Scientific Name	Family
Abelmoschus esculentus	Okra
Allium ampeloprasum	Leeks
Allium ampeloprasum ampeloprasum	Elephant Garlic
Allium sativum	Garlic
Allium tuberosum	Garlic chives
Amaranthus viridis	Vleeta
Asparagus officinalis	Asparagus
Beta vulgaris vulgaris	Swiss Chard
Cynara cardunculus	Artichokes
Ocimum basilicum	Basil
Opuntia ficus-indica	Prickly Pear cactus *(thornless)*
Petroselenium crispum	Parsley
Spinacia oleracea	Spinach

Nitrogen Fixers

Some of these may spread aggressively. Introduce with Caution.

Scientific Name	Family
Acacia baileyana	Cootamundra Wattle
Acacia latifolia	Golden Wattle
Acacia melonoxylon	Tasmanian Blackwood
Albizia julibrissin	Silk Tree
Astragalus Membranaceous	Astragalus/Huang Chi
Astragalus spp.	Milk Vetch
Ceanothus spp.	Ceanothus
Cercis occidentalis	Western Redbud
Cercis silaquastrum	Judas Tree
Colutea arborescens	Bladder Senna
Cytisus battandieri	Pineapple Broom
Cytisus proliferus	Tagasate/Tree Lucerne
Cytisus scoparius	Sterile Hybrid Scotch Broom
Elaeagnus multiflora	Goumi
Elaeagnus pungens	Silverberry
Elaeagnus umbellata	Autumn Olive
Elaeagnus x ebbingei	Hybrid Silverberry
Erythrina crista-galli	Cockspur Coral Tree
Hippophae rhamnoides	Sea Buckthorn
Indigofera tinctoria	Indigo
Lathyrus spp.	Perennial Sweet Pea
Lotus corniculatus	Birdsfoot Trefoil
Lupinus spp.	Lupines
Medicago sativa	Alfalfa/Lucerne
Pachyrhizus erosus	Jicama
Pisum sativum	Austrian Field Pea
Securigera varia	Crown Vetch
Spartium junceum	Spanish Broom
Trifolium incarnatum	Crimson Clover
Trifolium pratense	Red Clover
Trifolium repens	White Clover

Soil Loosening Plants

Use these varieties to break up compacted soils while establishing beds.

Scientific Name	Family
Arctium lappa	Gobo/Burdock Root
Beta vulgaris vulgaris	Mangel Beets
Chlorogalum spp.	Soap Root
Dioscorea spp.	Yam
Lathyrus spp.	Perennial Sweet Pea
Pachyrhizus erosus	Jicama
Raphanus raphanistrum	Daikon Radish
Raphanus raphanistrum	Black Spanish Radish

Fruit Orchards

F: Thrives in deep Fertile Soils
D: Tolerates deep Rocky Soils
* Likely to be drought-tolerant on native rootstock

Scientific Name	English Name	Conditions
Acca sellowiana	**Pineapple Guava**	FD
Actinidia deliciosa	Fuzzy Kiwi	F
Butia capitata	Jelly Palm	FD
Casimiroa edulis	**White Sapote**	FD
Citrus japonica	**Kumquat**	F
Citrus junos	**Yuzu Citrus**	FD
Cornus mas	Cornelian Cherry	D
Crataegus azarolus	Azarole	D
Cydonia oblonga	Common Quince	FD
Diospyros kaki	**Asian Persimmon**	FD
Diospyros virginiana	American Persimmon	FD
Eriobotrya japonica	**Loquat**	D
Ficus carica	**Fig**	D
Hippophae rhamnoides	Sea Buckthorn	D
Hovenia dulcis	Japanese Raisin Tree	F
Malus spp.	Apple*	FD
Mespilus germanica	Medlar	FD
Morus alba	**White Mulberry**	D
Morus alba x rubra	**Illinois Everbearing Mulberry**	D
Morus alba x rubra	**Silk Hope Mulberry**	
Morus nigra	**Black Mulberry**	D
Prunus armeniaca	**Apricot**	D
Prunus avium	Sweet Cherry *(low-chill)*	F
Prunus domestica	**European Plum**	F
Prunus dulcis	**Almond**	D
Prunus hybrids	**Plumcots, Apriums, Pluots, etc.**	D
Prunus persica	**Peach**	D
Prunus salicifolia	Capulin	D
Prunus salicina	**Asian Plum**	F
Punica granatum	**Pomegranate**	D
Pyrus communis	**European Pear***	F
Pyrus pyrifolia	**Asian Pear***	F
Sambucus canadensis	American Elderberry	F
Sambucus nigra	European Elderberry	F
Vitis spp.	**Grapes**	D
X Sorbopyrus auricularis	Shipova	D
Ziziphus jujuba	**Jujube**	D

Nut Groves

Scientific Name	English Name
Araucaria angustifolia	**Parana**
Araucaria araucana	**Monkey Puzzle**
Araucaria bidwillii	**Bunya Bunya**
Castanea dentata	American Chestnut
Castanea mollissima	Chinese Chestnut
Castanea pumila	Dwarf Chinquapin
Castanea sativa	**Sweet Chestnut**
Chrysolepis chrysophylla	Golden Chinquapin
Corylus spp.	**Filbert/Hazel**
Coylus colurna	Turkish Tree Hazel
Fagus sylvatica	European Beech
Gevuina avellana	**Chilean Hazel**
Ginkgo biloba	Ginkgo
Jubaea chilensis	Chilean Wine Palm
Jugans cinerea	Butternut
Juglans ailantifolia	Heartnut
Juglans regia	**English Walnut**
Juglans x bixbyi	Buartnut
Julans nigra	Black Walnut
Pinus koraiensis	**Korean Stone Pine**
Pinus pinea	**Italian Stone Pine**
Pinus pumila	Dwarf Siberian Pine
Pinus sabiniana	Digger Pine
Pistacia vera	Pistachio
Prunus dulcis	**Almond**
Quercus spp.	Hybrid Oaks
Umbellularia californica	California Bay Laurel
Xanthoceras sorbifolium	Yellowhorn

The Mild Microclimate

These species will most appreciate the sheltered micro-climate designated in the master plan.

Scientific Name	Family
Annona cherimola	Cherimoya
Carica pentagona	Babaco
Carissa macrocarpa	Natal Plum
Casimiroa edulis	White Sapote
Citrus japonica	Kumquat
Citrus reticulata	Mandarin
Citrus x limon	Lemon
Citrus x sinensis	Blood Orange
Citrus x sinensis	Sweet Orange
Eriobotrya japonica	Loquat
Macadamia spp.	Macadamia *(cold-hardy cultivars only)*
Persea americana	Avocado *(cold-hardy cultivars only)*
Prunus salicifolia	Capulin Cherry
Psidium cattleyanum	Strawberry Guava
Solanum betaceum	Tree tomato
Ugni molinae	Murtillo/Chilean Guava

Woodlots

Long-Term Timber Crop

Scientific Name	English Name
Acacia melanoxylon	**Tasmanian Blackwood**
Acer spp.	Maple
Calocedrus spp.	Incense Cedar
Carya spp.	Hickory
Castanea sativa	**Sweet Chestnut**
Cedrus spp.	Cedars
Corylus spp.	Hazel
Cupressus macrocarpa	Monterrey Cypress
Cupressus sempervirens	**Mediterranean Cypress**
Fagus spp.	Beech
Fraxinus excelsior	Ash
Fraxinus spp.	Ash
Gleditsia triacanthos	Honeylocust
Grevillea robusta	**Silk Oak**
Paulownia tomentosa	Empress Tree
Pinus halepensis	Aleppo Pine
Prunus spp.	Cherry
Quercus spp.	**Oaks**
Robinia pseudoacacia	Black Locust
Sequoia sempervirens	Coast Redwood
Ulmus spp.	Elm

Coppice Crops

Scientific Name	English Name
Acacia melanoxylon	**Tasmanian Blackwood**
Castanea spp.	**Chestnut***
Corylus spp.	Hazel
Cytisus proliferus	**Tagasate/Tree Lucerne**
Fagus spp.	**Beech***
Fraxinus spp.	Ash
Morus alba	White Mulberry
Quercus spp.	**Oak***
Robinia pseudoacacia	Black Locust
Sorbus spp.	Rowan

* Tried and true 10-30 year coppice species in Greece.

Windbreak

Trees

Scientific Name	English Name
Acacia melanoxylon	Tasmanian Blackwood
Araucaria angustifolia	Parana
Araucaria araucana	Monkey Puzzle
Araucaria bidwillii	Bunya Bunya
Castanea sativa	Sweet Chestnut
Cordyline australis	Cordyline
Corylus spp.	Filbert/Hazel
Coylus colurna	Turkish Tree Hazel
Crataegus spp.	Hawthorn
Cupressus macrocarpa	Monterey Cypress
Eucalyptus ficifolia	Red Flowering Gum
Eucommia ulmoides	Hardy Rubber Tree
Fagus sylvatica	European Beech
Gevuina avellana	Chilean Hazel
Grevillea robusta	Silk Oak
Metrosideros excelsa	New Zealand Pohutukawa
Pinus koraiensis	Korean Stone Pine
Pinus pinea	Italian Stone Pine
Podocarpus fortunei	Chinese Podocarp
Quercus spp.	Hybrid Oaks
Sorbus aucuparia	Mountain Ash
Tilia cordata	Little Leaf Linden
Umbellularia californica	California Bay Laurel
Xanthoceras sorbifolium	Yellowhorn

Shrubs

Scientific Name	English Name
Acacia baileyana	**Cootamundra Wattle**
Acacia latifolia	**Golden Wattle**
Berberis darwinii	Darwin Barberry
Buddleia globosa	Orange Ball Butterfly Bush
Carissa grandiflora	Natal Plum
Castanea pumila	Allegheny Chinkapin
Castanopsis chrysophylla	Golden Chinquapin
Ceanothus spp.	**Ceanothus/California Lilac**
Cercis occidentali/ siliquastrum	Western Redbud/ **Judas Tree**
Chamerops humilis	Mediterranean Fan Palm
Colutea arborescens	Bladder Senna
Corylus spp.	Filbert/Hazel
Cytisus proliferus	**Tagasaste/Tree Lucerne**
Elaeagnus multiflora	**Goumi**
Elaeagnus umbellata	**Autumn Olive**
Lavatera arborea	Tree Mallow
Mahonia x media 'Charity'	Mahonia 'Charity'
Myrica californica	**California Wax Myrtle**
Yucca gigantea	**Spineless Yucca**

Herbs

Scientific Name	English Name
Helianthus maximiliani	**Maximillian Sunflower**
Helianthus tuberosus	**Jerusalem Artichokes**
Hemerocalus spp.	**Daylily**
Inula helenium	**Elecampagne**
Medicago sativa	**Dryland Alfalfa**
Symphytum officinale	**Comfrey**
Trifolium pratense	**Red Clover**
Trifolium repens	**White Clover**

Plants for Bees & Pest Predators

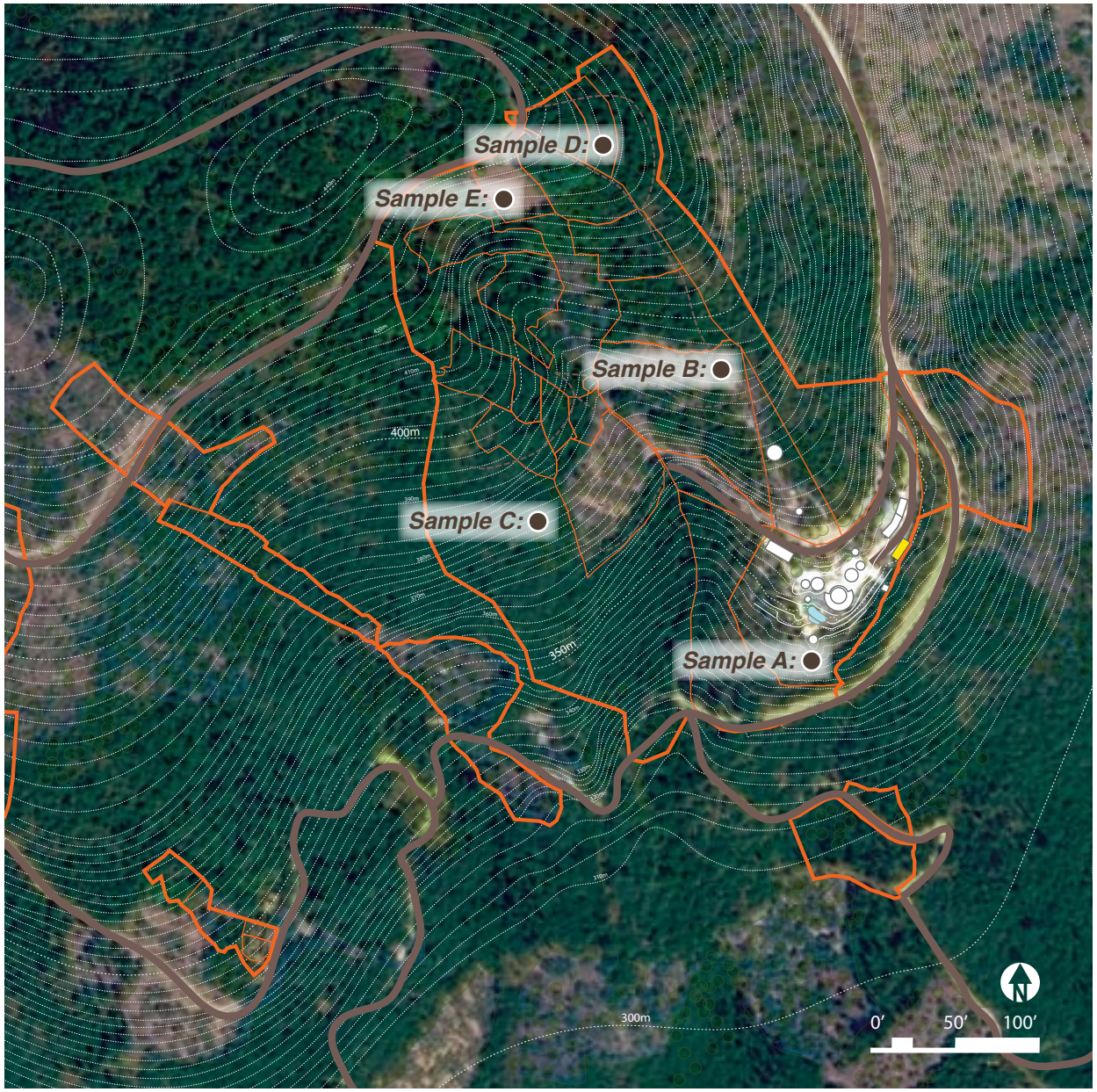
Scientific Name	English Name	Bloom Time			
		Spring	Summer	Fall	Winter
Achillea spp.	**Yarrow**		x	x	
Angelica archangelica	**Angelica**		x		
Aquilegia spp.	**Columbine**	x	x		
Aster spp.	**Asters**		x	x	
Callistemon spp.	**Bottlebrush**	x	x	x	x
Camassia spp.	Camas	x			
Cantua buxifolia	**Sacred Flower of the Andes**				
Castanea sativa	Sweet Chestnut	x			
Ceanothus spp.	**Ceanothus**		x		
Chrysanthemum parthenium	Feverfew	x	x	x	
Cichorium spp.	Chicory		x	x	
Corylus colurna	Turkish Tree Hazel	x			
Corylus spp.	Filbert/Hazel	x			
Cytisus proliferus	**Tree Lucerne/Tagasaste**				
Fagus sylvatica	European Beech	x			
Foeniculum vulgare	**Fennel**		x	x	
Gevuina avellana	Chilean Hazel	x			
Grevillea spp.	**Grevilleas**	x	x	x	x
Hammamelis virginiana	Witch Hazel				x
Helianthus spp.	Sunflowers		x	x	
Juglans regia	English Walnut	x			
Laurus nobilis	Bay Laurel	x			
Lavendula spp.	**Lavender**		x		
Leptospermum scoparium	**Australian Tea Rose**	x	x	x	x
Lespedeza spp.	**Bush Clovers**		x	x	
Mahonia 'Charity'	**Mahonia 'Charity'**				x
Medicago sativa	**Alfalfa**	x	x	x	
Melianthus major	Honeybush				
Melissa officinalis	**Lemon Balm**		x	x	
Nepeta cataria	**Catnip**		x		
Penstemon spp.	**Penstemon**		x		
Perovskia atriplicifolia	**Russian Sage**		x	x	
Petroselinum crispum	**Parsley**	x	x	x	
Phacelia tanacetifolia	Blue Tansy				
Prunus dulcis	Almond	x			
Quercus spp.	Hybrid Oaks	x			
Rosmarinus officinalis	**Rosemary**	x	x	x	
Rosmarinus prostratus	**Prostrate Rosemary**	x	x	x	
Salvia spp.	**Sages**		x	x	
Sarcococca hookeriana	Sweet Box				x
Scabiosa spp.	**Pincushion Flower**	x	x	x	
Solidago spp.	Goldenrod		x	x	
Stachys officinalis	Wood Betony		x		
Thymus spp	**Thyme**		x	x	
Trifolium pratense	**Red Clover**	x	x		
Trifolium repens	**White Clover**	x	x	x	
Verbena spp.	Vervain	x	x	x	
Vitex agnus-castus	Chaste Tree			x	

Soap Making Plants

These species can be integrated throughout the site.

Scientific Name	English Name
Ceanothus spp.	Ceanothus
Chlorogalum spp.	Amole
Simmondsia chinensis	Jojoba
Yucca spp.	Yucca

Soil Sample Locator Map



Water Tank Construction Options

Depending on the context, construction choices may vary. Here are the types of tanks you could choose and some thoughts to help guide those decisions.

1. **Ferrocement/Shotcrete/Gunite:** These tanks are made by creating a steel basket and then plastering (or "shooting") a sand/cement mix over it. They are long-lasting, non-toxic, and extremely durable (able to withstand earthquakes). Building them by hand is more labor intensive and will impact cost significantly. However, these tanks can be very large and can support small buildings placed on top of them. This makes them just about perfect for cisterns beneath buildings. Given the steepness of the property, these may not be the most appropriate solution everywhere. There is also some question as to whether putting in this type of water tank would require special permitting (it is clearly a permanent structure).
2. **Poured Concrete:** More load bearing. Best for stone houses. Uses more cement. Slightly less earthquake proof. Looks like a conventional basement.
3. **Corrugated Metal:** These tanks are made of curved, corrugated metal panels and can hold large volumes. Inside the tank is a polyethylene tank liner (which extends the life of the tank). Metals tanks will likely be faster to erect than ferrocement. These may have the shortest lifespan of the tanks (there is conflicting information, but some estimates are as low as 15 years), but they are probably also the cheapest. Heavier galvanization will lead to longer lasting tanks. They must be round and cannot be buried. They are not load bearing for anything beyond a platform. These tanks may not require permitting and are easy to assemble.
4. **Polyethylene:** These tanks are limited in size and are more expensive per gallon stored. They can last 15 years or more if protected from the sun (which also improves quality of stored water). These tanks are not load bearing. They don't need to be built onsite and can be moved at anytime. They clearly not permanent, which may ease permitting.

Αποτελέσματα Αναλύσεων / Results

Κωδικός δείγματος *Sample Code* **2016-45946**
Περίοδος Ανάλυσης *Period of Analysis* **12/10/2016 - 21/10/2016**
Χαρακτηρισμός Πελάτη *Client's Declaration* **A) TOWER, APRICOT OR CITRUS**
Τοποθεσία *Location*
Χειρισμός Δείγματος *Sample manipulation*
Κατάσταση δείγματος κατά την παραλαβή *Sample condition upon receipt* **Κανονική / Acceptable**

Παράμετρος Parameter	Μονάδα Unit	Αποτέλεσμα Result	Μέθοδος Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Νάτριο-Sodium (Na)	mg/Kg	**380**	O.B.01.301 CH3COONH4-ICP				

A. Βασικές Αναλύσεις Εδάφους / Basic Soil Analyses

A1. Φυσικοχημικές Ιδιότητες

Παράμετρος Parameter	Μονάδα Unit	Αποτέλεσμα Result	Μέθοδος Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Άμμος-Sand	%	**31,3**	O.B. 1.2.313 Bouyoucos Hydrometer				
Ιλύς-Silt	%	**26**	O.B. 1.2.313 Bouyoucos Hydrometer				
Άργιλος-Clay	%	**42,7**	O.B. 1.2.313 Bouyoucos Hydrometer				
pH	μονάδες-units pH	**7,7**	O.B. 01.302 1:2 H2O				
Ολικό CaCO3-Total Calcium Carbonate	%	**1,1**	O.B.01.303 Pressure Calcimeter Method Modified based on Method of Soil Analysis 1996 Part 3				
Οργανική Ουσία-Organic Matter	%	**6,9**	O.B.01.304 Modified Walkley-Black based on Method of Soil Analysis 1996 Part 3				
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC)	mS/cm	**1,08**	O.B. 1.2.311 τροπ. πάστα κορεσμού-Saturated paste				

A2. Διαθέσιμες Μορφές Θρεπτικών

Παράμετρος Parameter	Μονάδα Unit	Αποτέλεσμα Result	Μέθοδος Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Μαγνήσιο-Magnesium (Mg)	mg/Kg	**186**	O.B.01.301 CH3COONH4-ICP				
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3)	mgN-NO3/Kg	**11,7**	O.B.1.2.307 KCl-UV				
Φώσφορος-Phosphorus (P)	mg/Kg	**1,1**	O.B.1.2.306 Olsen-ICP				
Κάλιο-Potassium (K)	mg/Kg	**316**	O.B.01.301 CH3COONH4-ICP				
Χαλκός-Copper (Cu)	mg/Kg	**5,3**	O.B.01.300 DTPA-ICP				
Ψευδάργυρος-Zinc (Zn)	mg/kg	**3,07**	O.B.01.300 DTPA-ICP				
Μαγγάνιο-Manganese (Mn)	mg/Kg	**31,4**	O.B.01.300 DTPA-ICP				
Σίδηρος-Iron (Fe)	mg/Kg	**18,5**	O.B.01.300 DTPA-ICP				
Βόριο-Boron (B)	mg/Kg	**0,47**	O.B.1.2.308 CaCl2-ICP				

Αριθμός Πιστοποιητικού/ Certificate No : 01-8230/02.11.2016

του αντιδείγματος ορίζεται στον 1 μήνα από την ημερομηνία έκδοσης του παρόντος πιστοποιητικού (στις κατάλληλες συνθήκες
αι αν ο πελάτης εγγράφως έχει ορίσει διαφορετικά. Εξαιρούνται ευαλλοίωτα δείγματα, τα οποία δεν μπορούν να συντηρηθούν για
ονικό διάστημα.

ιβαλλοντικών Αναλύσεων
ental Analysis Laboratory

Καλλιέργεια / Crop : **Εγκατάσταση δένδρων**

Σχόλια και οδηγίες για τη μεταχείριση του εδάφους / Comments and instructions for soil manipulation

pH: Το pH είναι υψηλό και πιθανόν να δημιουργήσει προβλήματα τροφοπενειών μικροθρεπτικών και φωσφόρου,ιδιαίτερα σιδήρου και είναι κατάλληλο για καλλιέργειες που απσιτούν αλκαλικό έδαφος πχ τρούφα.Να αποφεύγονται ποικιλίες ή καλλιέργειες πολύ ευαίσθητες (πχ κρανιές, ακτινίδια κλη) Να μην εγκαθίστανται δένδρα που απαιτούν όξινο έδαφος (πχ καστανιές). Όπου είναι δυνατόν να χρησιμοποιούνται κατάλληλα,ανθεκτικά υποκείμενα και να γίνεται προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο. (βλέπε και οργανική ουσία) και να ερωτούνται και ειδικοί. Το άζωτο,είναι σκόπιμο να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν την φύτευση ή και αργότερα,στη βασική λίπανση σε αμμωνιακή,ενώ μετά την φύτευση ή και αργότερα στην επιφανειακή λίπανση,να εφαρμόζεται σε νιτρική μορφή.Στη τρούφα η λίπανση να γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες. (Βλέπε και ανθρακικό ασβέστιο).Προληπτικά χρήσιμοι θα είναι διαφυλλικοί ψεκασμοί που να περιέχουν και ιχνοστοιχεία καθώς επίσης και φώσφορο,ενισχυμένοι σε σίδηρο και Zn.
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC): Δεν υπάρχει πρόβλημα αλατότητας.
Ολικό CaCO3-Total Calcium Carbonate: Ποσοστό επιθυμητό για τις περισσότερες περιπτώσεις και σχετικά κατάλληλο για καλιέργειες που απαιτούν αλκαλικό έδαφος π.χ. τρούφα.Η πιθανότητα χλωρώσεων (Fe) είναι πολύ μικρή.(Να μην εγκαθίστανται καλλιέργειες που απαιτούν όξινο έδαφος πχ καστανιές. Βλέπε και pH. Το άζωτο,είναι σκόπιμο να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν την φύτευση ή και αργότερα στην βασική λίπανση σε αμμωνιακή, ενώ στην επιφανειακή λίπανση σε νιτρική μορφή. Στη τρούφα η λίπανση γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες.
Οργανική Ουσία-Organic Matter: Η οργανική ουσία υψηλή και πιθανόν πρόβλημα για τη τρούφα. Να ερωτούνται και ειδικοί. Δεν απαιτείται προσθήκη κοπριάς για 3-4 χρόνια.Να μειωθεί η δόση του αζώτου κατά 5-6 μονάδες/στρ.Να ελλατώνεται η δόση του αζώτου κατά 1,5-2 μονάδες για κάθε 1tn προστιθέμενης χωνεμένης κοπριάς στο στρέμμα.
Μηχανική Σύσταση-Texture: Έδαφος βαρύ που πιθανόν να δημιουργήσει προβλήματα στράγγισης,καθώς και μη ικανοποιητικής ανάπτυξης των ριζών και των δένδρων ή και της τρούφας όταν καλλιεργείται.Σε κάθε περίπτωση πριν την εγκατάσταση να ερωτούνται και ειδικοί. Να ελεγχθεί αν το έδαφος είναι αρκετά βαθύ, μη τυχόν υπάρχει αδιαπέρατος ορίζων και αν η υπόγεια στάθμη του νερού βρίσκεται σε αρκετό βάθος. Να διατηρούνται συνθήκες ξηρασίας και αερισμού στους λαιμούς των δένδρων. Είναι σκόπιμο να γίνει προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο.(Βλέπε οργανική ουσία).Η κατεργασία του εδάφους να περιορίζεται στην ελάχιστη δυνατή και απόλυτα απαραίτητη,να γίνεται όταν το έδαφος βρίσκεται στον ρόγο του,δηλαδή ούτε πολύ υγρό ούτε πολύ ξερό και προτιμότερο να χρησιμοποιούνται εδαφοσχίστες (ρίπερ)πριν την εγκατάσταση. Μετά την εγκατάσταση προτιμότερο να χρησιμοποιούνται καταστροφείς ή χορτοκοπτικά και αφού ξηλοποιηθούν οι κορμοί ίσως και ζιζανιοκτόνα.

Συμβουλευτική Λίπανση / Consulting soil

Μαγνήσιο-Magnesium (Mg): Υψηλή περιεκτικότητα που επαρκεί για τα πρώτα 2-3 ή πιθανόν και περισσότερα χρόνια.Αν το κάλιο είναι τριπλάσιο και πλέον του μαγνησίου προληπτικά μπορούν να εφαρμοσθούν πριν την φύτευση 2-3 μονάδες Mg/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 60-80g θεϊικού μαγνησίου στο έδαφος του λάκκου φύτευσης, οπότε προληπτικά πιθανόν χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα μαγνησίου.
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3): Οριακή περιεκτικότητα. Να ενσωματωθούν πριν την φύτευση 5-8 μονάδες αζώτου/στρ.ή 0,04-0,05 μονάδες στο έδαφος του λάκκου φύτευσης.Το 1/2 της δόσης του αζώτου,είναι προτιμότερο να εφαρμοσθεί πριν την φύτευση και το υπόλοιπο στην επιφανειακή λίπανση (Απρίλη-Μάη) και κυρίως αν το έδαφος είναι ελαφρύ.Βλέπε οργανική ουσία,pH και ανθρακικό ασβέστιο.
Φώσφορος-Phosphorus (P): Χαμηλή περιεκτικότητα.Να προστεθούν πριν την φύτευση 12-14 μονάδες φωσφόρου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 0,12-0,15 μονάδες/δενδρύλλιο,στο έδαφος του λάκκου φύτευσης.Η λίπανση επαρκεί για τα πρώτα 2-3 χρόνια.
Κάλιο-Potassium (K): Υψηλή περιεκτικότητα, επαρκής για τα πρώτα 2-3 ή και πιθανόν και περισσότερα χρόνια.Αν το μαγνήσιο είναι τριπλάσιο και πλέον του καλίου να προστεθούν προληπτικά 5-6 μονάδες καλίου/στρή 0,1 μονάδες (K) στο έδαφος του λάκκου φύτευσης.
Χαλκός-Copper (Cu): Υψηλή περιεκτικότητα.Δεν απαιτείται λίπανση με χαλκό για τα πρώτα 2-3 χρόνια ή και περισσότερα.
Μαγγάνιο-Manganese (Mn): Υψηλή περιεκτικότητα. Αν η ποικιλία είναι ευαίσθητη ή αργότερα παρατηρηθούν συμπτώματα τοξικότητας μαγγανίου,όπως κακή ανάπτυξη,ξήρανση και πτώση των φύλλων, σκοτεινόχρωμες κηλίδες, εσχαρώσεις του φλοιού κλπ, να βελτιωθεί η στράγγιση και να απομακρύνονται σαπισμένα φύλλα, χόρτα κλπ. Πιθανόν να απαιτηθεί και ασβέστωση κυρίως αν δεν υπάρχει ανθρακικό ασβέστιο στο έδαφος.Βλέπε και pH.
Σίδηρος-Iron (Fe): Υψηλή περιεκτικότητα που όμως δεν δημιουργεί προβλήματα (βλέπε pH και ανθρακικό ασβέστιο)
Βόριο-Boron (B): Οριακή περιεκτικότητα.Προληπτικά να ενσωματωθούν πριν την φύτευση, 1-2Kg βόρακα/στρ.(σε βάθος 20εκ.),ή 10-15g στο έδαφος του λάκκου φύτευσης. Οι δόσεις να μην ξεπερνούν τις συνιστώμενες και επαρκούν για 2-3 χρόνια.Χρήσιμοι διαφυλλικοί ψεκασμοί με σκεύασμα βορίου.
Ψευδάργυρος-Zinc (Zn): Υψηλή περιεκτικότητα επαρκής για 3-4 χρόνια.

Η παρούσα συμβουλευτική λίπανση αγροτεμαχίου προκύπτει με βάση τα εργαστηριακά αποτελέσματα του δείγματος που προσκομίστηκε και αναφέρονται στο παρόν πιστοποιητικό και είναι ενδεικτική για την αναφερόμενη γενική καλλιέργεια. Ενδέχεται να απαιτούνται προσαρμογές λόγω των παραμέτρων της ηλικίας, της καλλιέργειας, του τρόπου φύτευσης, των κλιματολογικών συνθηκών ή άλλων ιδιαίτερων παραμέτρων που μπορεί να αφορούν το συγκεκριμένο αγροτεμάχιο.

Αποτελέσματα Αναλύσεων / Results

Κωδικός δείγματος *Sample Code* **2016-45947**
Περίοδος Ανάλυσης *Period of Analysis* **12/10/2016 - 21/10/2016**
Χαρακτηρισμός Πελάτη *Client's Declaration* **B) WIND CHARGE, SWEET POTATOES OR PEANUTS**
Τοποθεσία *Location*
Χειρισμός Δείγματος *Sample manipulation*
Κατάσταση δείγματος κατά την παραλαβή *Sample condition upon receipt* **Κανονική / Acceptable**

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Νάτριο-Sodium (Na)	mg/Kg	**279**	O.B.01.301 CH3COONH4-ICP				

A. Βασικές Αναλύσεις Εδάφους / Basic Soil Analyses

A1. Φυσικοχημικές Ιδιότητες

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Άμμος-Sand	%	**29,3**	O.B. 1.2.313 Bouyoucos Hydrometer				
Ιλύς-Silt	%	**24**	O.B. 1.2.313 Bouyoucos Hydrometer				
Άργιλος-Clay	%	**46,7**	O.B. 1.2.313 Bouyoucos Hydrometer				
pH	μονάδες-units pH	**7,7**	O.B. 01.302 1:2 H2O				
Ολικό CaCO3-Total Calcium Carbonate	%	**1,4**	O.B.01.303 Pressure Calcimeter Method Modified based on Method of Soil Analysis 1996 Part 3				
Οργανική Ουσία-Organic Matter	%	**6,1**	O.B.01.304 Modified Walkley-Black based on Method of Soil Analysis 1996 Part 3				
Ειδ. Ηλ. Αγωγιμότητα-Electrical	mS/cm	**1,02**	O.B. 1.2.311 τροπ. πάστα κορεσμού-Saturated paste				

A2. Διαθέσιμες Μορφές Θρεπτικών

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Μαγνήσιο-Magnesium (Mg)	mg/Kg	**112**	O.B.01.301 CH3COONH4-ICP				
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3)	mgN-NO3/Kg	**9,7**	O.B.1.2.307 KCl-UV				
Φώσφορος-Phosphorus (P)	mg/Kg	**4,1**	O.B.1.2.306 Olsen-ICP				
Κάλιο-Potassium (K)	mg/Kg	**834**	O.B.01.301 CH3COONH4-ICP				
Χαλκός-Copper (Cu)	mg/Kg	**5,5**	O.B.01.300 DTPA-ICP				
Ψευδάργυρος-Zinc (Zn)	mg/kg	**2,78**	O.B.01.300 DTPA-ICP				
Μαγγάνιο-Manganese (Mn)	mg/Kg	**29,3**	O.B.01.300 DTPA-ICP				
Σίδηρος-Iron (Fe)	mg/Kg	**19,9**	O.B.01.300 DTPA-ICP				
Βόριο-Boron (B)	mg/Kg	**0,65**	O.B.1.2.308 CaCl2-ICP				

ιντιδείγματος ορίζεται στον 1 μήνα από την ημερομηνία έκδοσης του παρόντος πιστοποιητικού (στις κατάλληλες συνθήκες ο πελάτης εγγράφως έχει ορίσει διαφορετικά. Εξαιρούνται ευαλλοίωτα δείγματα, τα οποία δεν μπορούν να συντηρηθούν για διάστημα.

λοντικών Αναλύσεων
Analysis Laboratory

Καλλιέργεια / Crop : **Εγκατάσταση**

Σχόλια και οδηγίες για τη μεταχείριση του εδάφους / Comments and instructions for soil manipulation

λυτική Χημικός
tical Chemist

pH: Το pH είναι υψηλό και πιθανόν να δημιουργήσει προβλήματα τροφοπενειών μικροθρεπτικών και φωσφόρου,ιδιαίτερα σιδήρου και είναι κατάλληλο για καλλιέργειες που απσιτούν αλκαλικό έδαφος πχ τρούφα.Να αποφεύγονται ποικιλίες ή καλλιέργειες πολύ ευαίσθητες (πχ κρανιές, ακτινίδια κλπ) Να μην εγκαθίστανται δένδρα που απαιτούν όξινο έδαφος (πχ καστανιές). Όπου είναι δυνατόν να χρησιμοποιούνται κατάλληλα,ανθεκτικά υποκείμενα και να γίνεται προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο. (βλέπε και οργανική ουσία) και να ερωτούνται και ειδικοί. Το άζωτο,είναι σκόπιμο να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν την φύτευση ή και αργότερα,στη βασική λίπανση σε αμμωνιακή,ενώ μετά την φύτευση ή και αργότερα στην επιφανειακή λίπανση,να εφαρμόζεται σε νιτρική μορφή.Στη τρούφα η λίπανση να γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες. (Βλέπε και ανθρακικό ασβέστιο).Προληπτικά χρήσιμοι θα είναι διαφυλλικοί ψεκασμοί που να περιέχουν και ιχνοστοιχεία καθώς επίσης και φώσφορο,ενισχυμένοι σε σίδηρο και Zn.
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC): Δεν υπάρχει πρόβλημα αλατότητας.
Ολικό CaCO3-Total Calcium Carbonate: Ποσοστό επιθυμητό για τις περισσότερες περιπτώσεις και σχετικά κατάλληλο για καλιέργειες που απαιτούν αλκαλικό έδαφος π.χ. τρούφα.Η πιθανότητα χλωρώσεων (Fe) είναι πολύ μικρή.(Να μην εγκαθίστανται καλλιέργειες που απαιτούν όξινο έδαφος πχ καστανιές. Βλέπε και pH. Το άζωτο,είναι σκόπιμο να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν την φύτευση ή και αργότερα στην βασική λίπανση σε αμμωνιακή, ενώ στην επιφανειακή λίπανση σε νιτρική μορφή. Στη τρούφα η λίπανση γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες.
Οργανική Ουσία-Organic Matter: Η οργανική ουσία υψηλή και πιθανόν πρόβλημα για τη τρούφα. Να ερωτούνται και ειδικοί. Δεν απαιτείται προσθήκη κοπριάς για 3-4 χρόνια.Να μειωθεί η δόση του αζώτου κατά 5-6 μονάδες/στρ.Να ελλατώνεται η δόση του αζώτου κατά 1,5-2 μονάδες για κάθε 1tn προστιθέμενης χωνεμένης κοπριάς στο στρέμμα.
Μηχανική Σύσταση-Texture: Έδαφος βαρύ που πιθανόν να δημιουργήσει προβλήματα στράγγισης,καθώς και μη ικανοποιητικής ανάπτυξης των ριζών και των δένδρων ή και της τρούφας όταν καλλιεργείται.Σε κάθε περίπτωση πριν την εγκατάσταση να ερωτούνται και ειδικοί. Να ελεγχθεί αν το έδαφος είναι αρκετά βαθύ, μη τυχόν υπάρχει αδιαπέρατος ορίζων και αν η υπόγεια στάθμη του νερού βρίσκεται σε αρκετό βάθος. Να διατηρούνται συνθήκες ξηρασίας και αερισμού στους λαιμούς των δένδρων. Είναι σκόπιμο να γίνει προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο.(Βλέπε οργανική ουσία).Η κατεργασία του εδάφους να περιορίζεται στην ελάχιστη δυνατή και απόλυτα απαραίτητη,να γίνεται όταν το έδαφος βρίσκεται στον ρόγο του,δηλαδή ούτε πολύ υγρό ούτε πολύ ξερό και προτιμότερο να χρησιμοποιούνται εδαφοσχίστες (ρίπερ)πριν την εγκατάσταση. Μετά την εγκατάσταση προτιμότερο να χρησιμοποιούνται καταστροφείς ή χορτοκοπτικά και αφού ξηλοποιηθούν οι κορμοί ίσως και ζιζανιοκτόνα.

Συμβουλευτική Λίπανση / Consulting soil

Μαγνήσιο-Magnesium (Mg): Επαρκής προς υψηλή περιεκτικότητα.Προληπτικά να προστεθούν 2-3 μονάδες μαγνησίου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 60-80g θειϊκού μαγνησίου στο έδαφος του λάκκου φύτευσης.Προληπτικά χρήσιμοι και διαφυλλικοί ψεκασμοί με σκεύασμα μαγνησίου.
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3): Οριακή περιεκτικότητα. Να ενσωματωθούν πριν την φύτευση 5-8 μονάδες αζώτου/στρ.ή 0,04-0,05 μονάδες στο έδαφος του λάκκου φύτευσης.Το 1/2 της δόσης του αζώτου,είναι προτιμότερο να εφαρμοσθεί πριν την φύτευση και το υπόλοιπο στην επιφανειακή λίπανση (Απρίλη-Μάη) και κυρίως αν το έδαφος είναι ελαφρύ.Βλέπε οργανική ουσία,pH και ανθρακικό ασβέστιο.
Φώσφορος-Phosphorus (P): Χαμηλή περιεκτικότητα.Να προστεθούν πριν την φύτευση 12-14 μονάδες φωσφόρου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 0,12-0,15 μονάδες/δενδρύλλιο,στο έδαφος του λάκκου φύτευσης.Η λίπανση επαρκεί για τα πρώτα 2-3 χρόνια.
Κάλιο-Potassium (K): Υψηλή περιεκτικότητα, επαρκής για τα πρώτα 2-3 ή και πιθανόν και περισσότερα χρόνια.Αν το μαγνήσιο είναι τριπλάσιο και πλέον του καλίου να προστεθούν προληπτικά 5-6 μονάδες καλίου/στρή 0,1 μονάδες (K) στο έδαφος του λάκκου φύτευσης.
Χαλκός-Copper (Cu): Υψηλή περιεκτικότητα.Δεν απαιτείται λίπανση με χαλκό για τα πρώτα 2-3 χρόνια ή και περισσότερα.
Μαγγάνιο-Manganese (Mn): Επαρκής περιεκτικότητα για 2-3 ή και περισσότερα χρόνια.
Σίδηρος-Iron (Fe): Υψηλή περιεκτικότητα που όμως δεν δημιουργεί προβλήματα (βλέπε pH και ανθρακικό ασβέστιο)
Βόριο-Boron (B): Οριακή περιεκτικότητα.Προληπτικά να ενσωματωθούν πριν την φύτευση, 1-2Kg βόρακα/στρ.(σε βάθος 20εκ.),ή 10-15g στο έδαφος του λάκκου φύτευσης. Οι δόσεις να μην ξεπερνούν τις συνιστώμενες και επαρκούν για 2-3 χρόνια.Χρήσιμοι διαφυλλικοί ψεκασμοί με σκεύασμα βορίου.
Ψευδάργυρος-Zinc (Zn): Επαρκής περιεκτικότητα για τα πρώτα 2-3 χρόνια.

Η παρούσα συμβουλευτική λίπανση αγροτεμαχίου προκύπτει με βάση τα εργαστηριακά αποτελέσματα του δείγματος που προσκομίστηκε και αναφέρονται στο παρόν πιστοποιητικό και είναι ενδεικτική για την αναφερόμενη γενική καλλιέργεια. Ενδέχεται να απαιτούνται προσαρμογές λόγω των παραμέτρων της ηλικίας, της καλλιέργειας, του τρόπου φύτευσης, των κλιματολογικών συνθηκών ή άλλων ιδιαίτερων παραμέτρων που μπορεί να αφορούν το συγκεκριμένο αγροτεμάχιο.

Αποτελέσματα Αναλύσεων / Results

Κωδικός δείγματος *Sample Code* **2016-45948**
Περίοδος Ανάλυσης *Period of Analysis* **12/10/2016 - 21/10/2016**
Χαρακτηρισμός Πελάτη *Client's Declaration* **C) OLIVES**
Τοποθεσία *Location*
Χειρισμός Δείγματος *Sample manipulation*
Κατάσταση δείγματος κατά την παραλαβή *Sample condition upon receipt* **Κανονική / Acceptable**

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Νάτριο-Sodium (Na)	mg/Kg	**407**	O.B.01.301 CH3COONH4-ICP				

A. Βασικές Αναλύσεις Εδάφους / Basic Soil Analyses

A1. Φυσικοχημικές Ιδιότητες

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Άμμος-Sand	%	**17,3**	O.B. 1.2.313 Bouyoucos Hydrometer				
Ιλύς-Silt	%	**16**	O.B. 1.2.313 Bouyoucos Hydrometer				
Άργιλος-Clay	%	**66,7**	O.B. 1.2.313 Bouyoucos Hydrometer				
pH	μονάδες-units pH	**7,7**	O.B. 01.302 1:2 H2O				
Ολικό CaCO3-Total Calcium Carbonate	%	**0,1**	O.B.01.303 Pressure Calcimeter Method Modified based on Method of Soil Analysis 1996 Part 3				
Οργανική Ουσία-Organic Matter	%	**4,7**	O.B.01.304 Modified Walkley-Black based on Method of Soil Analysis 1996 Part 3				
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC)	mS/cm	**0,38**	O.B. 1.2.311 τροπ. πάστα κορεσμού-Saturated paste				

A2. Διαθέσιμες Μορφές Θρεπτικών

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Μαγνήσιο-Magnesium (Mg)	mg/Kg	**243**	O.B.01.301 CH3COONH4-ICP				
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3)	mgN-NO3/Kg	**5,9**	O.B.1.2.307 KCl-UV				
Φώσφορος-Phosphorus (P)	mg/Kg	**2,5**	O.B.1.2.306 Olsen-ICP				
Κάλιο-Potassium (K)	mg/Kg	**1127**	O.B.01.301 CH3COONH4-ICP				
Χαλκός-Copper (Cu)	mg/Kg	**5,6**	O.B.01.300 DTPA-ICP				
Ψευδάργυρος-Zinc (Zn)	mg/kg	**3,65**	O.B.01.300 DTPA-ICP				
Μαγγάνιο-Manganese (Mn)	mg/Kg	**67,3**	O.B.01.300 DTPA-ICP				
Σίδηρος-Iron (Fe)	mg/Kg	**43,8**	O.B.01.300 DTPA-ICP				
Βόριο-Boron (B)	mg/Kg	**0,51**	O.B.1.2.308 CaCl2-ICP				

Αριθμός Πιστοποιητικού/ Certificate No : 01-8232/02.11.2016

του αντιδείγματος ορίζεται στον 1 μήνα από την ημερομηνία έκδοσης του παρόντος πιστοποιητικού (στις κατάλληλες συνθήκες ιι αν ο πελάτης εγγράφως έχει ορίσει διαφορετικά. Εξαιρούνται ευαλλοίωτα δείγματα, τα οποία δεν μπορούν να συντηρηθούν για ονικό διάστημα.

ιβαλλοντικών Αναλύσεων
ental Analysis Laboratory

Καλλιέργεια / Crop : **Εγκατάσταση δένδρων**

Σχόλια και οδηγίες για τη μεταχείριση του εδάφους / Comments and instructions for soil manipulation

pH: Το pH είναι υψηλό και πιθανόν να δημιουργήσει προβλήματα τροφοπενειών μικροθρεπτικών και φωσφόρου,ιδιαίτερα σιδήρου και είναι κατάλληλο για καλλιέργειες που απσιτούν αλκαλικό έδαφος πχ τρούφα.Να αποφεύγονται ποικιλίες ή καλλιέργειες πολύ ευαίσθητες (πχ κρανιές, ακτινίδια κλη) Να μην εγκαθίστανται δένδρα που απαιτούν όξινο έδαφος (πχ καστανιές). Όπου είναι δυνατόν να χρησιμοποιούνται κατάλληλα,ανθεκτικά υποκείμενα και να γίνεται προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο. (βλέπε και οργανική ουσία) και να ερωτούνται και ειδικοί. Το άζωτο,είναι σκόπιμο να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν την φύτευση ή και αργότερα,στη βασική λίπανση σε αμμωνιακή,ενώ μετά την φύτευση ή και αργότερα στην επιφανειακή λίπανση,να εφαρμόζεται σε νιτρική μορφή.Στη τρούφα η λίπανση να γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες. (Βλέπε και ανθρακικό ασβέστιο).Προληπτικά χρήσιμοι θα είναι διαφυλλικοί ψεκασμοί που να περιέχουν και ιχνοστοιχεία καθώς επίσης και φώσφορο,ενισχυμένοι σε σίδηρο και Zn.
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC): Δεν υπάρχει πρόβλημα αλατότητας.
Ολικό CaCO3-Total Calcium Carbonate: Ποσοστό επιθυμητό για τις περισσότερες περιπτώσεις και σχετικά κατάλληλο για καλιέργειες που απαιτούν αλκαλικό έδαφος π.χ. τρούφα.Να μην εγκαθίστανται καλλιέργειες που απαιτούν όξινο έδαφος(πχ καστανιές). Βλέπε και pH. Το άζωτο,μπορεί να εφαρμόζετα,σε όξινη μορφή και προτιμότερο, πριν την φύτευση ή και αργότερα στην βασική λίπανση,σε αμμωνιακή,ενώ μετά την φύτευση ή και αργότερα στην επιφανειακή λίπανση,σε νιτρική μορφή ή και ένα μέρος σε νιτρικό ασβέστιο. Στη τρούφα η λίπανση γίνεται σε όλη την έκταση και οι δόσεις του (N) να είναι περιορισμένες.Προληπτικά,χρήσιμοι διαφυλλικοί ψεκασμοί με σκεύασμα ασβεστίου.
Οργανική Ουσία-Organic Matter: Η οργανική ουσία σε ικανοποιητικό επίπεδο και υψηλή για τη τρούφα. Να ερωτούνται και ειδικοί.Να μειωθεί η δόση του αζώτου κατά 2-4 μονάδες/στρ.Χρήσιμο θα είναι να ενσωματώνονται ελαφρά κάθε 3 χρόνια 1-2tn/στρ.χωνεμένη κοπριά,αν υπάρχει δυνατότητα και όχι σε τρούφα, οπότε να ελλατώνεται η δόση του αζώτου κατά 1,5-2 μονάδες για κάθε 1tn προστιθέμενης χωνεμένης κοπριάς στο στρέμμα.
Μηχανική Σύσταση-Texture: Έδαφος βαρύ που πιθανόν να δημιουργήσει προβλήματα στράγγισης,καθώς και μη ικανοποιητικής ανάπτυξης των ριζών και των δένδρων ή και της τρούφας όταν καλλιεργείται.Σε κάθε περίπτωση πριν την εγκατάσταση να ερωτούνται και ειδικοί. Να ελεγχθεί αν το έδαφος είναι αρκετά βαθύ, μη τυχόν υπάρχει αδιαπέρατος ορίζων και αν η υπόγεια στάθμη του νερού βρίσκεται σε αρκετό βάθος. Να διατηρούνται συνθήκες ξηρασίας και αερισμού στους λαιμούς των δένδρων. Είναι σκόπιμο να γίνει προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο.(Βλέπε οργανική ουσία).Η κατεργασία του εδάφους να περιορίζεται στην ελάχιστη δυνατή και απόλυτα απαραίτητη,να γίνεται όταν το έδαφος βρίσκεται στον ρόγο του,δηλαδή ούτε πολύ υγρό ούτε πολύ ξερό και προτιμότερο να χρησιμοποιούνται εδαφοσχίστες (ρίπερ)πριν την εγκατάσταση. Μετά την εγκατάσταση προτιμότερο να χρησιμοποιούνται καταστροφείς ή χορτοκοπτικά και αφού ξηλοποιηθούν οι κορμοί ίσως και ζιζανιοκτόνα.

Συμβουλευτική Λίπανση / Consulting soil

Μαγνήσιο-Magnesium (Mg): Υψηλή περιεκτικότητα που επαρκεί για τα πρώτα 2-3 ή πιθανόν και περισσότερα χρόνια.Αν το κάλιο είναι τριπλάσιο και πλέον του μαγνησίου προληπτικά μπορούν να εφαρμοσθούν πριν την φύτευση 2-3 μονάδες Mg/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 60-80g θεϊικού μαγνησίου στο έδαφος του λάκκου φύτευσης, οπότε προληπτικά πιθανόν χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα μαγνησίου.
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3): Οριακή περιεκτικότητα. Να ενσωματωθούν πριν την φύτευση 5-8 μονάδες αζώτου/στρ.ή 0,04-0,05 μονάδες στο έδαφος του λάκκου φύτευσης.Το 1/2 της δόσης του αζώτου,είναι προτιμότερο να εφαρμοσθεί πριν την φύτευση και το υπόλοιπο στην επιφανειακή λίπανση (Απρίλη-Μάη) και κυρίως αν το έδαφος είναι ελαφρύ.Βλέπε οργανική ουσία,pH και ανθρακικό ασβέστιο.
Φώσφορος-Phosphorus (P): Χαμηλή περιεκτικότητα.Να προστεθούν πριν την φύτευση 12-14 μονάδες φωσφόρου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 0,12-0,15 μονάδες/δενδρύλλιο,στο έδαφος του λάκκου φύτευσης.Η λίπανση επαρκεί για τα πρώτα 2-3 χρόνια.
Κάλιο-Potassium (K): Υψηλή περιεκτικότητα, επαρκής για τα πρώτα 2-3 ή και πιθανόν και περισσότερα χρόνια.Αν το μαγνήσιο είναι τριπλάσιο και πλέον του καλίου να προστεθούν προληπτικά 5-6 μονάδες καλίου/στρή 0,1 μονάδες (K) στο έδαφος του λάκκου φύτευσης.
Χαλκός-Copper (Cu): Υψηλή περιεκτικότητα.Δεν απαιτείται λίπανση με χαλκό για τα πρώτα 2-3 χρόνια ή και περισσότερα.
Μαγγάνιο-Manganese (Mn): Υψηλή περιεκτικότητα. Αν η ποικιλία είναι ευαίσθητη ή αργότερα παρατηρηθούν συμπτώματα τοξικότητας μαγγανίου,όπως κακή ανάπτυξη,ξήρανση και πτώση των φύλλων, σκοτεινόχρωμες κηλίδες, εσχαρώσεις του φλοιού κλπ, να βελτιωθεί η στράγγιση και να απομακρύνονται σαπισμένα φύλλα, χόρτα κλπ. Πιθανόν να απαιτηθεί και ασβέστωση κυρίως αν δεν υπάρχει ανθρακικό ασβέστιο στο έδαφος.Βλέπε και pH.
Σίδηρος-Iron (Fe): Υψηλή περιεκτικότητα που όμως δεν δημιουργεί προβλήματα (βλέπε pH και ανθρακικό ασβέστιο)
Βόριο-Boron (B): Οριακή περιεκτικότητα.Προληπτικά να ενσωματωθούν πριν την φύτευση, 1-2Kg βόρακα/στρ.(σε βάθος 20εκ.),ή 10-15g στο έδαφος του λάκκου φύτευσης. Οι δόσεις να μην ξεπερνούν τις συνιστώμενες και επαρκούν για 2-3 χρόνια.Χρήσιμοι διαφυλλικοί ψεκασμοί με σκεύασμα βορίου.
Ψευδάργυρος-Zinc (Zn): Υψηλή περιεκτικότητα επαρκής για 3-4 χρόνια.

Η παρούσα συμβουλευτική λίπανση αγροτεμαχίου προκύπτει με βάση τα εργαστηριακά αποτελέσματα του δείγματος που προσκομίστηκε και αναφέρονται στο παρόν πιστοποιητικό και είναι ενδεικτική για την αναφερόμενη γενική καλλιέργεια. Ενδέχεται να απαιτούνται προσαρμογές λόγω των παραμέτρων της ηλικίας, της καλλιέργειας, του τρόπου φύτευσης, των κλιματολογικών συνθηκών ή άλλων ιδιαίτερων παραμέτρων που μπορεί να αφορούν το συγκεκριμένο αγροτεμάχιο.

Αποτελέσματα Αναλύσεων / Results

Κωδικός δείγματος *Sample Code* **2016-45949**
Περίοδος Ανάλυσης *Period of Analysis* **12/10/2016 - 21/10/2016**
Χαρακτηρισμός Πελάτη *Client's Declaration* **D) FOREST, SWEET CHESTNUTS OR PECANS**
Τοποθεσία *Location*
Χειρισμός Δείγματος *Sample manipulation*
Κατάσταση δείγματος κατά την παραλαβή *Sample condition upon receipt* **Κανονική / Acceptable**

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Νάτριο-Sodium (Na)	mg/Kg	**294**	O.B.01.301 CH3COONH4-ICP				

A. Βασικές Αναλύσεις Εδάφους / Basic Soil Analyses

A1. Φυσικοχημικές Ιδιότητες

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Άμμος-Sand	%	**35,3**	O.B. 1.2.313 Bouyoucos Hydrometer				
Ιλύς-Silt	%	**20**	O.B. 1.2.313 Bouyoucos Hydrometer				
Άργιλος-Clay	%	**44,7**	O.B. 1.2.313 Bouyoucos Hydrometer				
pH	μονάδες-units pH	**6,7**	O.B. 01.302 1:2 H2O				
Ολικό CaCO3-Total Calcium Carbonate	%	**0,0**	O.B.01.303 Pressure Calcimeter Method Modified based on Method of Soil Analysis 1996 Part 3				
Οργανική Ουσία-Organic Matter	%	**7,1**	O.B.01.304 Modified Walkley-Black based on Method of Soil Analysis 1996 Part 3				
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC)	mS/cm	**0,81**	O.B. 1.2.311 τροπ. πάστα κορεσμού-Saturated paste				

A2. Διαθέσιμες Μορφές Θρεπτικών

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Μαγνήσιο-Magnesium (Mg)	mg/Kg	**258**	O.B.01.301 CH3COONH4-ICP				
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3)	mgN-NO3/Kg	**12,7**	O.B.1.2.307 KCl-UV				
Φώσφορος-Phosphorus (P)	mg/Kg	**1,4**	O.B.1.2.306 Olsen-ICP				
Κάλιο-Potassium (K)	mg/Kg	**452**	O.B.01.301 CH3COONH4-ICP				
Χαλκός-Copper (Cu)	mg/Kg	**7,6**	O.B.01.300 DTPA-ICP				
Ψευδάργυρος-Zinc (Zn)	mg/kg	**4,90**	O.B.01.300 DTPA-ICP				
Μαγγάνιο-Manganese (Mn)	mg/Kg	**82,2**	O.B.01.300 DTPA-ICP				
Σίδηρος-Iron (Fe)	mg/Kg	**58,9**	O.B.01.300 DTPA-ICP				
Βόριο-Boron (B)	mg/Kg	**1,0**	O.B.1.2.308 CaCl2-ICP				

Αριθμός Πιστοποιητικού/ Certificate No : 01-8233/02.11.2016

του αντιδείγματος ορίζεται στον 1 μήνα από την ημερομηνία έκδοσης του παρόντος πιστοποιητικού (στις κατάλληλες συνθήκες
αι αν ο πελάτης εγγράφως έχει ορίσει διαφορετικά. Εξαιρούνται ευαλλοίωτα δείγματα, τα οποία δεν μπορούν να συντηρηθούν για
ονικό διάστημα.

ιβαλλοντικών Αναλύσεων
ental Analysis Laboratory

Καλλιέργεια / Crop : **Εγκατάσταση δένδρων**

Σχόλια και οδηγίες για τη μεταχείριση του εδάφους / Comments and instructions for soil manipulation

pH: Το pH σε επιθυμητό επίπεδο γενικά και σχετικά κατάλληλο για δέντρα που απαιτούν όξινο έδαφος πχ καστανιές. Να μην εγκαθίστανται καλλιέργειες που απαιτούν αλκαλικό έδαφος π.χ. τρούφα. Να ερωτούνται και ειδικοί. Έως και το 1/2 της δόσης του αζώτου μπορεί να εφαρμόζεται σε όξινη μορφή και προτιμότερο πριν τη φύτευση ή και αργότερα στη βασική λίπανση σε αμμωνιακή,ενώ το υπόλοιπο και μετά την φύτευση στην επιφανειακή λίπανση,να εφαρμόζεται σε ασβεστούχο νιτρική αμμωνία ενώ σε δένδρα που απαιτούν όξινο έδαφος π.χ. καστανιές σε νιτρική μορφή.Προληπτικά χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα ασβεστίου.
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC): Δεν υπάρχει πρόβλημα αλατότητας.
Οργανική Ουσία-Organic Matter: Η οργανική ουσία υψηλή και πιθανόν πρόβλημα για τη τρούφα. Να ερωτούνται και ειδικοί..Δεν απαιτείται προσθήκη κοπριάς.Να μειωθεί η δόση του αζώτου κατά 7-8 μονάδες/στρ.Να ελαττώνεται η δόση του αζώτου κατά 1,5-2 μονάδες για κάθε 1 tn προστιθέμενης κοπριάς.
Μηχανική Σύσταση-Texture: Έδαφος βαρύ που πιθανόν να δημιουργήσει προβλήματα στράγγισης,καθώς και μη ικανοποιητικής ανάπτυξης των ριζών και των δένδρων ή και της τρούφας όταν καλλιεργείται.Σε κάθε περίπτωση πριν την εγκατάσταση να ερωτούνται και ειδικοί. Να ελεγχθεί αν το έδαφος είναι αρκετά βαθύ, μη τυχόν υπάρχει αδιαπέρατος ορίζων και αν η υπόγεια στάθμη του νερού βρίσκεται σε αρκετό βάθος. Να διατηρούνται συνθήκες ξηρασίας και αερισμού στους λαιμούς των δένδρων. Είναι σκόπιμο να γίνει προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο.(Βλέπε οργανική ουσία).Η κατεργασία του εδάφους να περιορίζεται στην ελάχιστη δυνατή και απόλυτα απαραίτητη,να γίνεται όταν το έδαφος βρίσκεται στον ρόγο του,δηλαδή ούτε πολύ υγρό ούτε πολύ ξερό και προτιμότερο να χρησιμοποιούνται εδαφοσχίστες (ρίπερ)πριν την εγκατάσταση. Μετά την εγκατάσταση προτιμότερο να χρησιμοποιούνται καταστροφείς ή χορτοκοπτικά και αφού ξηλοποιηθούν οι κορμοί ίσως και ζιζανιοκτόνα.

Συμβουλευτική Λίπανση / Consulting soil

Μαγνήσιο-Magnesium (Mg): Υψηλή περιεκτικότητα που επαρκεί για τα πρώτα 2-3 ή πιθανόν και περισσότερα χρόνια.Αν το κάλιο είναι τριπλάσιο και πλέον του μαγνησίου προληπτικά μπορούν να εφαρμοσθούν πριν την φύτευση 2-3 μονάδες Mg/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 60-80g θεϊικού μαγνησίου στο έδαφος του λάκκου φύτευσης, οπότε προληπτικά πιθανόν χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα μαγνησίου.
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3): Οριακή περιεκτικότητα. Να ενσωματωθούν πριν την φύτευση 5-8 μονάδες αζώτου/στρ.ή 0,04-0,05 μονάδες στο έδαφος του λάκκου φύτευσης.Το 1/2 της δόσης του αζώτου,είναι προτιμότερο να εφαρμοσθεί πριν την φύτευση και το υπόλοιπο στην επιφανειακή λίπανση (Απρίλη-Μάη) και κυρίως αν το έδαφος είναι ελαφρύ.Βλέπε οργανική ουσία,pH και ανθρακικό ασβέστιο.
Φώσφορος-Phosphorus (P): Χαμηλή περιεκτικότητα.Να προστεθούν πριν την φύτευση 12-14 μονάδες φωσφόρου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 0,12-0,15 μονάδες/δενδρύλλιο,στο έδαφος του λάκκου φύτευσης.Η λίπανση επαρκεί για τα πρώτα 2-3 χρόνια.
Κάλιο-Potassium (K): Υψηλή περιεκτικότητα, επαρκής για τα πρώτα 2-3 ή και πιθανόν και περισσότερα χρόνια.Αν το μαγνήσιο είναι τριπλάσιο και πλέον του καλίου να προστεθούν προληπτικά 5-6 μονάδες καλίου/στρή 0,1 μονάδες (K) στο έδαφος του λάκκου φύτευσης.
Χαλκός-Copper (Cu): Υψηλή περιεκτικότητα.Δεν απαιτείται λίπανση με χαλκό για τα πρώτα 2-3 χρόνια ή και περισσότερα.
Μαγγάνιο-Manganese (Mn): Υψηλή περιεκτικότητα. Αν η ποικιλία είναι ευαίσθητη ή αργότερα παρατηρηθούν συμπτώματα τοξικότητας μαγγανίου,όπως κακή ανάπτυξη,ξήρανση και πτώση των φύλλων, σκοτεινόχρωμες κηλίδες, εσχαρώσεις του φλοιού κλπ, να βελτιωθεί η στράγγιση και να απομακρύνονται σαπισμένα φύλλα, χόρτα κλπ. Πιθανόν να απαιτηθεί και ασβέστωση κυρίως αν δεν υπάρχει ανθρακικό ασβέστιο στο έδαφος.Βλέπε και pH.
Σίδηρος-Iron (Fe): Υψηλή περιεκτικότητα που όμως δεν δημιουργεί προβλήματα (βλέπε pH και ανθρακικό ασβέστιο)
Βόριο-Boron (B): Επαρκής περιεκτικότητα για 3-4 χρόνια.
Ψευδάργυρος-Zinc (Zn): Υψηλή περιεκτικότητα επαρκής για 3-4 χρόνια.

Η παρούσα συμβουλευτική λίπανση αγροτεμαχίου προκύπτει με βάση τα εργαστηριακά αποτελέσματα του δείγματος που προσκομίστηκε και αναφέρονται στο παρόν πιστοποιητικό και είναι ενδεικτική για την αναφερόμενη γενική καλλιέργεια. Ενδέχεται να απαιτούνται προσαρμογές λόγω των παραμέτρων της ηλικίας, της καλλιέργειας, του τρόπου φύτευσης, των κλιματολογικών συνθηκών ή άλλων ιδιαίτερων παραμέτρων που μπορεί να αφορούν το συγκεκριμένο αγροτεμάχιο.

Αποτελέσματα Αναλύσεων / Results

Κωδικός δείγματος *Sample Code* **2016-45950**
Περίοδος Ανάλυσης *Period of Analysis* **12/10/2016 - 21/10/2016**
Χαρακτηρισμός Πελάτη *Client's Declaration* **E) GRAPES, GRAPES OR KIWIS**
Τοποθεσία *Location*
Χειρισμός Δείγματος *Sample manipulation*
Κατάσταση δείγματος κατά την παραλαβή *Sample condition upon receipt* **Κανονική / Acceptable**

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Νάτριο-Sodium (Na)	mg/Kg	**274**	O.B.01.301 CH3COONH4-ICP				

A. Βασικές Αναλύσεις Εδάφους / Basic Soil Analyses

A1. Φυσικοχημικές Ιδιότητες

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Άμμος-Sand	%	**23,3**	O.B. 1.2.313 Bouyoucos Hydrometer				
Ιλύς-Silt	%	**20**	O.B. 1.2.313 Bouyoucos Hydrometer				
Άργιλος-Clay	%	**56,7**	O.B. 1.2.313 Bouyoucos Hydrometer				
pH	μονάδες-units pH	**5,7**	O.B. 01.302 1:2 H2O				
Ολικό CaCO3-Total Calcium Carbonate	%	**0,0**	O.B.01.303 Pressure Calcimeter Method Modified based on Method of Soil Analysis 1996 Part 3				
Οργανική Ουσία-Organic Matter	%	**4,4**	O.B.01.304 Modified Walkley-Black based on Method of Soil Analysis 1996 Part 3				
Ειδ. Ηλ. Αγωγιμότητα-Electrical	mS/cm	**1,01**	O.B. 1.2.311 τροπ. πάστα κορεσμού-Saturated paste				

A2. Διαθέσιμες Μορφές Θρεπτικών

Παράμετρος Parameter	**Μονάδα** Unit	**Αποτέλεσμα** Result	**Μέθοδος** Method	Χαμηλό Low	Οριακό Medium	Επαρκές Normal	Υψηλό High
Μαγνήσιο-Magnesium (Mg)	mg/Kg	**345**	O.B.01.301 CH3COONH4-ICP				
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3)	mgN-NO3/Kg	**37,4**	O.B.1.2.307 KCl-UV				
Φώσφορος-Phosphorus (P)	mg/Kg	**1,9**	O.B.1.2.306 Olsen-ICP				
Κάλιο-Potassium (K)	mg/Kg	**515**	O.B.01.301 CH3COONH4-ICP				
Χαλκός-Copper (Cu)	mg/Kg	**27,5**	O.B.01.300 DTPA-ICP				
Ψευδάργυρος-Zinc (Zn)	mg/kg	**2,28**	O.B.01.300 DTPA-ICP				
Μαγγάνιο-Manganese (Mn)	mg/Kg	**77,1**	O.B.01.300 DTPA-ICP				
Σίδηρος-Iron (Fe)	mg/Kg	**49,9**	O.B.01.300 DTPA-ICP				
Βόριο-Boron (B)	mg/Kg	**0,85**	O.B.1.2.308 CaCl2-ICP				

Ασβέστωση: 1100kg/στρ $CaCO_3$

ιντιδείγματος ορίζεται στον 1 μήνα από την ημερομηνία έκδοσης του παρόντος πιστοποιητικού (στις κατάλληλες συνθήκες ο πελάτης εγγράφως έχει ορίσει διαφορετικά. Εξαιρούνται ευαλλοίωτα δείγματα, τα οποία δεν μπορούν να συντηρηθούν για διάστημα.

λοντικών Αναλύσεων
Analysis Laboratory

Καλλιέργεια / Crop : **Εγκατάσταση δένδρων**

Σχόλια και οδηγίες για τη μεταχείριση του εδάφους / Comments and instructions for soil manipulation

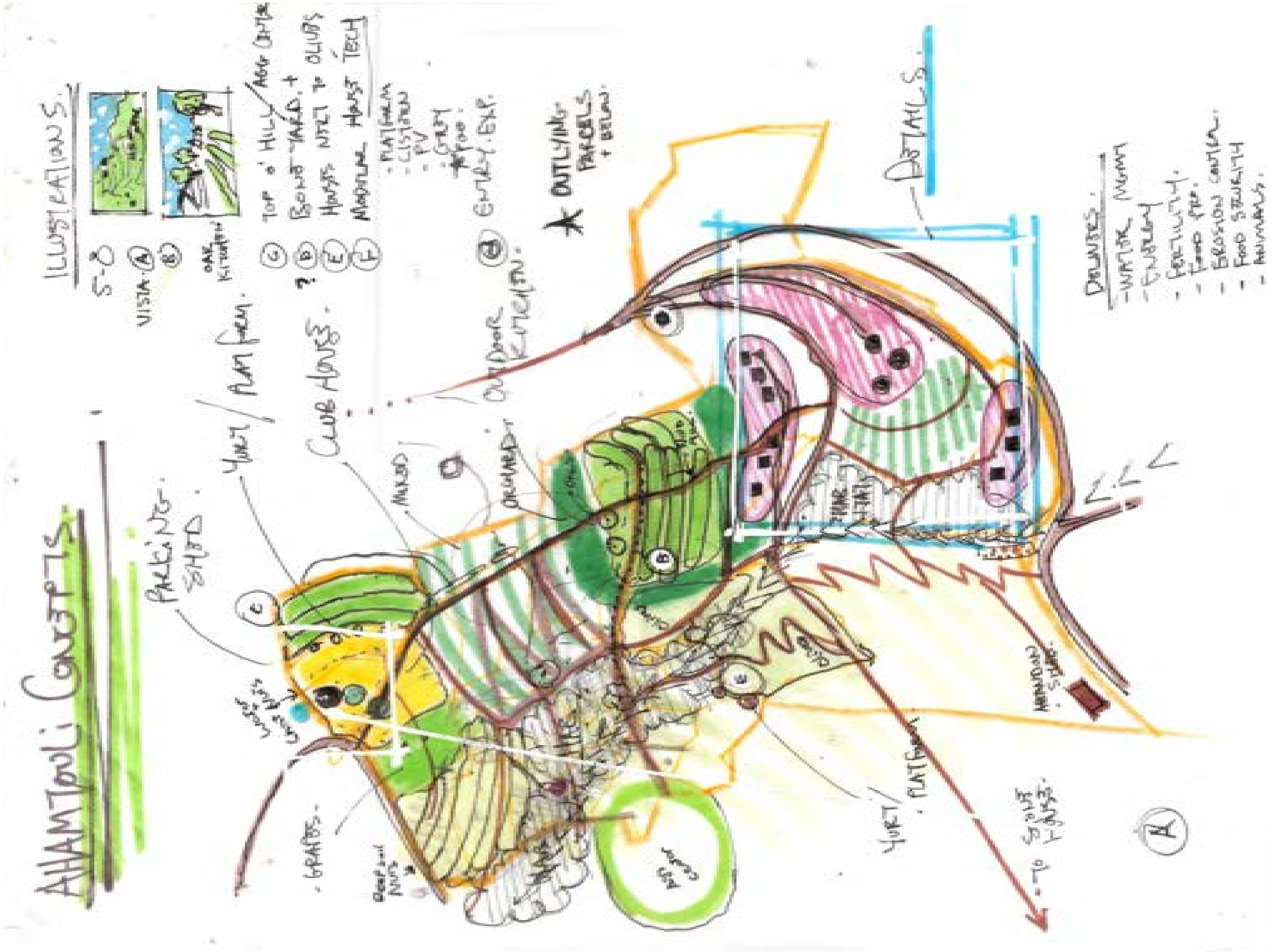
λυτική Χημικός
tical Chemist

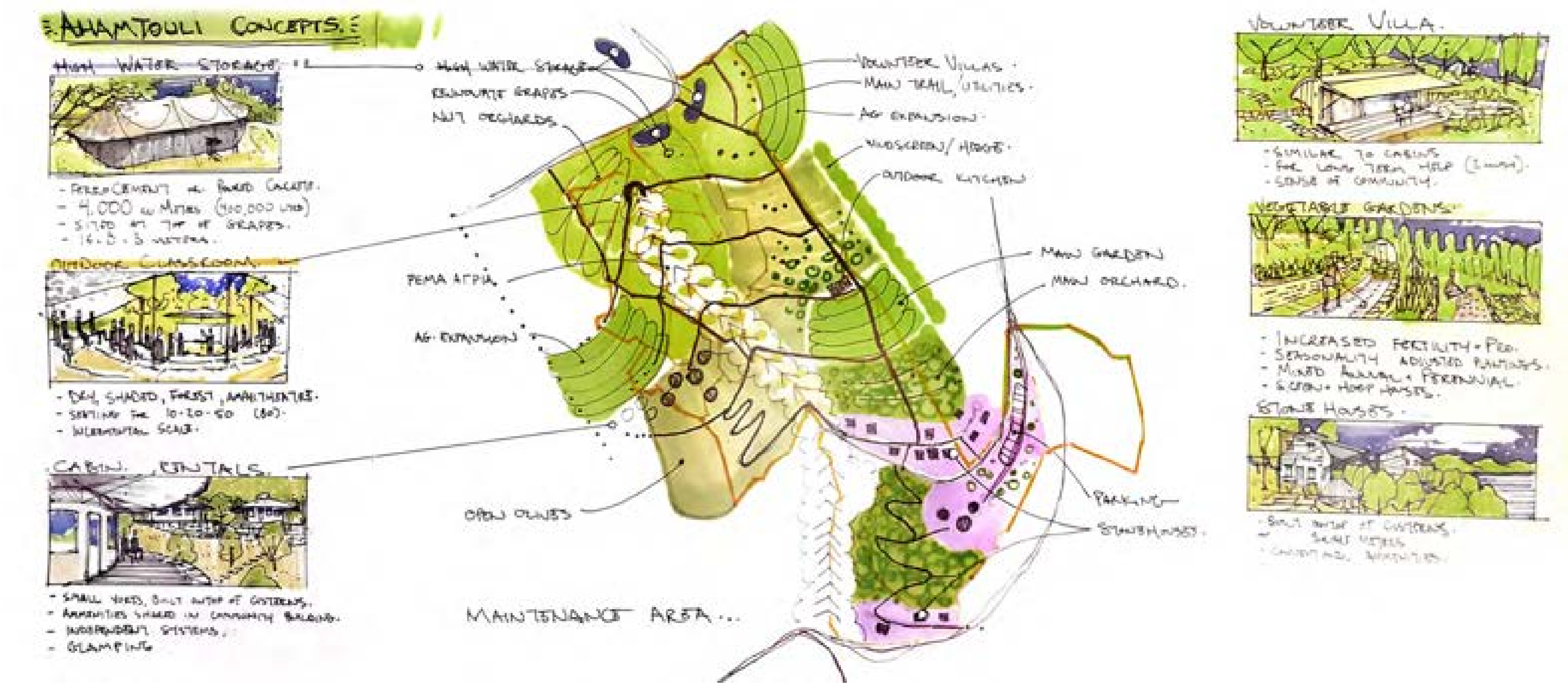
pH: Το pH χαμηλό.Η ασβέστωση κρίνεται σκόπιμη,με στόχο το pH στο 6,5 εκτός αν η καλλιέργεια απαιτεί όξινο έδαφος (πχ καστανιές) και να ελέγχεται τακτικά να μη μεταβάλλεται από το επιθυμητό γενικά 6,5 ή 5,5 σε καστανιές. Να μην εγκαθίστανται καλλιέργειες που απαιτούν αλκαλιλικό έδαφος π.χ. τρούφα. Να ερωτούνται και ειδικοί.Η εφαρμογή να γίνει τουλάχιστον 2-3 μήνες πριν από την εγκατάσταση, με ενσωμάτωση του αναφερόμενου ποσού CaCO3, σε βάθος 30cm, σε όλη την έκταση. Άν προτιμηθεί η ασβεστοϊλύς της ΕΒΖ,να αυξηθεί η ποσότητα κατά 30%. Αν χρησιμοποιηθεί υδράσβεστος η ποσότητα να μειωθεί κατά 30%. Η δόση να μην ξεπερνά την συνιστώμενη. Να ελεγχθεί και το pH του υπεδάφους.Να αποφεύγονται το δυνατόν τα όξινα λιπάσματα. Έως και το 1/2 της δόσης του αζώτου μπορεί να εφαρμόζεται σε όξινη μορφή αν έχει γίνει η συνιστώμενη ασβέστωση και προτιμότερο πριν τη φύτευση ή και αργότερα στη βασική λίπανση σε αμμωνιακή, ενώ το υπόλοιπο και μετά την φύτευση ή και αργότερα στην επιφανειακή λίπανση να εφαρμόζεται,σε ασβεστούχο νιτρική αμμωνία. Αν η καλλιέργεια απαιτεί όξινο έδαφος (πχ καστανιές) ένα μικρό μέρος πρίν τη φύτευση ή αργότερα στη βασική λίπανση να εφαρμόζεται σε αμμωνιακή και το υπόλοιπο σε νιτρική μορφή.Προληπτικά χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα ασβεστίου.
Ειδ. Ηλ. Αγωγιμότητα-Electrical Conductivity (EC): Δεν υπάρχει πρόβλημα αλατότητας.
Οργανική Ουσία-Organic Matter: Η οργανική ουσία σε ικανοποιητικό επίπεδο και υψηλή για τη τρούφα. Να ερωτούνται και ειδικοί.Να μειωθεί η δόση του αζώτου κατά 2-4 μονάδες/στρ.Χρήσιμο θα είναι να ενσωματώνονται ελαφρά κάθε 3 χρόνια 1-2tn/στρ.χωνεμένη κοπριά,αν υπάρχει δυνατότητα και όχι σε τρούφα, οπότε να ελλατώνεται η δόση του αζώτου κατά 1,5-2 μονάδες για κάθε 1tn προστιθέμενης χωνεμένης κοπριάς στο στρέμμα.
Μηχανική Σύσταση-Texture: Έδαφος βαρύ που πιθανόν να δημιουργήσει προβλήματα στράγγισης,καθώς και μη ικανοποιητικής ανάπτυξης των ριζών και των δένδρων ή και της τρούφας όταν καλλιεργείται.Σε κάθε περίπτωση πριν την εγκατάσταση να ερωτούνται και ειδικοί. Να ελεγχθεί αν το έδαφος είναι αρκετά βαθύ, μη τυχόν υπάρχει αδιαπέρατος ορίζων και αν η υπόγεια στάθμη του νερού βρίσκεται σε αρκετό βάθος. Να διατηρούνται συνθήκες ξηρασίας και αερισμού στους λαιμούς των δένδρων. Είναι σκόπιμο να γίνει προσπάθεια αύξησης ή και διατήρησης της οργανικής ουσίας σε ικανοποιητικό επίπεδο.(Βλέπε οργανική ουσία).Η κατεργασία του εδάφους να περιορίζεται στην ελάχιστη δυνατή και απόλυτα απαραίτητη,να γίνεται όταν το έδαφος βρίσκεται στον ρόγο του,δηλαδή ούτε πολύ υγρό ούτε πολύ ξερό και προτιμότερο να χρησιμοποιούνται εδαφοσχίστες (ρίπερ)πριν την εγκατάσταση. Μετά την εγκατάσταση προτιμότερο να χρησιμοποιούνται καταστροφείς ή χορτοκοπτικά και αφού ξηλοποιηθούν οι κορμοί ίσως και ζιζανιοκτόνα.

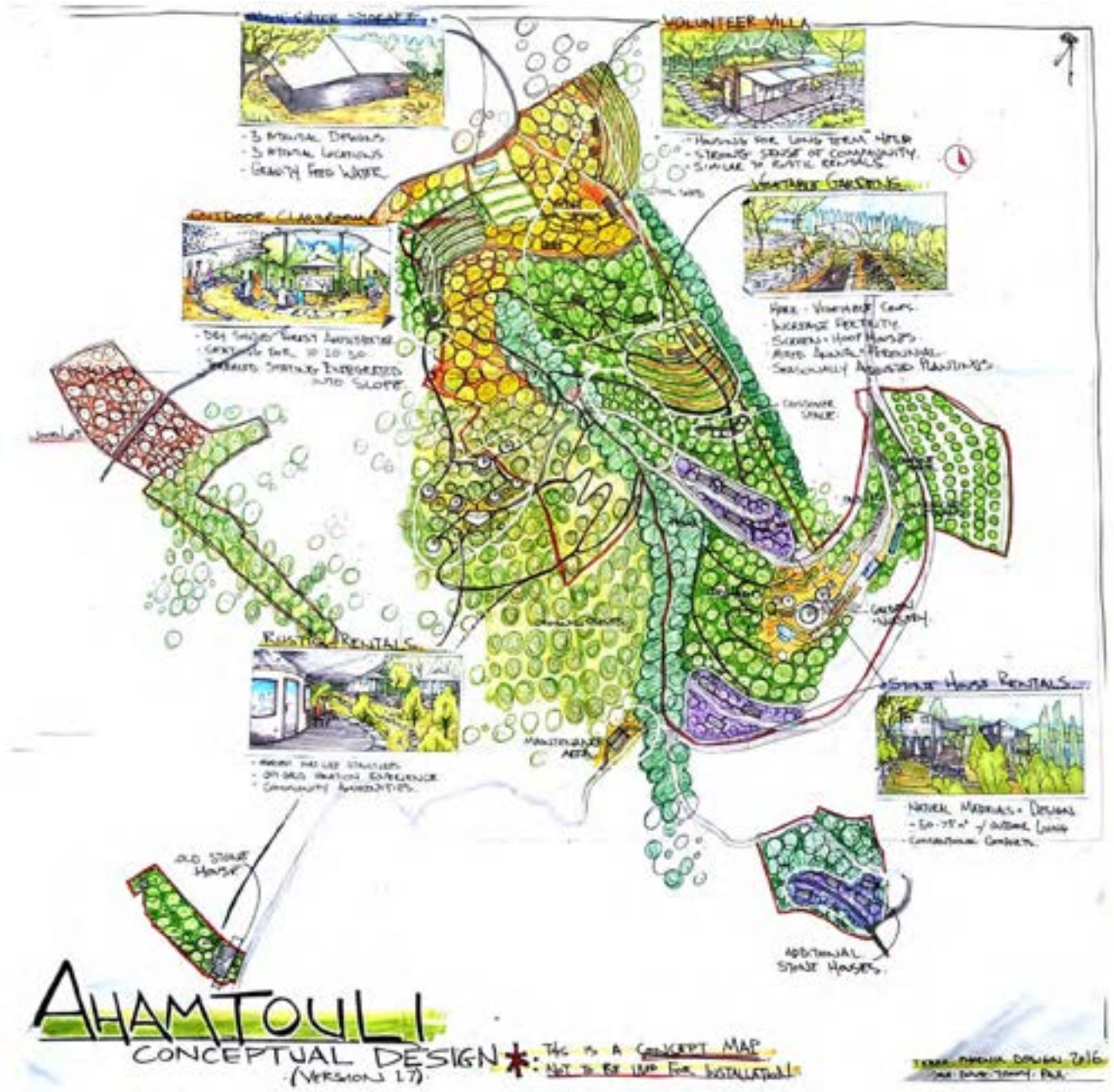
Συμβουλευτική Λίπανση / Consulting soil

Μαγνήσιο-Magnesium (Mg): Υψηλή περιεκτικότητα που επαρκεί για τα πρώτα 2-3 ή πιθανόν και περισσότερα χρόνια.Αν το κάλιο είναι τριπλάσιο και πλέον του μαγνησίου προληπτικά μπορούν να εφαρμοσθούν πριν την φύτευση 2-3 μονάδες Mg/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 60-80g θεϊικού μαγνησίου στο έδαφος του λάκκου φύτευσης, οπότε προληπτικά πιθανόν χρήσιμοι θα είναι και διαφυλλικοί ψεκασμοί με σκεύασμα μαγνησίου.
Νιτρικό Άζωτο-Nitrate Nitrogen (N-NO3): Υψηλή περιεκτικότητα. Να μην γίνει λίπανση με άζωτο,ιδιαίτερα αν έχει προστεθεί καλά χωνεμένη κοπριά.Αν μετά την φύτευση ακολουθήσουν πολλές βροχές και κυρίως αν η ανάπτυξη των δένδρων δεν είναι ικανοποιητική, μπορεί να γίνει μια επιφανειακή συντηρητική λίπανση (Απρίλη-Μάη)όπως για παράδειγμα 0,01-0,015 μονάδες αζώτου/δενδρύλλιο.Βλέπε οργανική ουσία, pH και ανθρακικό ασβέστιο.
Φώσφορος-Phosphorus (P): Χαμηλή περιεκτικότητα.Να προστεθούν πριν την φύτευση 12-14 μονάδες φωσφόρου/στρ.και να ενσωματωθούν σε όλη την έκταση του χωραφιού (βάθος 20cm) ή 0,12-0,15 μονάδες/δενδρύλλιο,στο έδαφος του λάκκου φύτευσης.Η λίπανση επαρκεί για τα πρώτα 2-3 χρόνια.
Κάλιο-Potassium (K): Υψηλή περιεκτικότητα, επαρκής για τα πρώτα 2-3 ή και πιθανόν και περισσότερα χρόνια.Αν το μαγνήσιο είναι τριπλάσιο και πλέον του καλίου να προστεθούν προληπτικά 5-6 μονάδες καλίου/στρή 0,1 μονάδες (K) στο έδαφος του λάκκου φύτευσης.
Χαλκός-Copper (Cu): Υψηλή περιεκτικότητα.Δεν απαιτείται λίπανση με χαλκό για τα πρώτα 2-3 χρόνια ή και περισσότερα.
Μαγγάνιο-Manganese (Mn): Υψηλή περιεκτικότητα. Αν η ποικιλία είναι ευαίσθητη ή αργότερα παρατηρηθούν συμπτώματα τοξικότητας μαγγανίου,όπως κακή ανάπτυξη,ξήρανση και πτώση των φύλλων, σκοτεινόχρωμες κηλίδες, εσχαρώσεις του φλοιού κλπ, να βελτιωθεί η στράγγιση και να απομακρύνονται σαπισμένα φύλλα, χόρτα κλπ. Πιθανόν να απαιτηθεί και ασβέστωση κυρίως αν δεν υπάρχει ανθρακικό ασβέστιο στο έδαφος.Βλέπε και pH.
Σίδηρος-Iron (Fe): Υψηλή περιεκτικότητα που όμως δεν δημιουργεί προβλήματα (βλέπε pH και ανθρακικό ασβέστιο)
Βόριο-Boron (B): Επαρκής περιεκτικότητα για 3-4 χρόνια.
Ψευδάργυρος-Zinc (Zn): Επαρκής περιεκτικότητα για τα πρώτα 2-3 χρόνια.

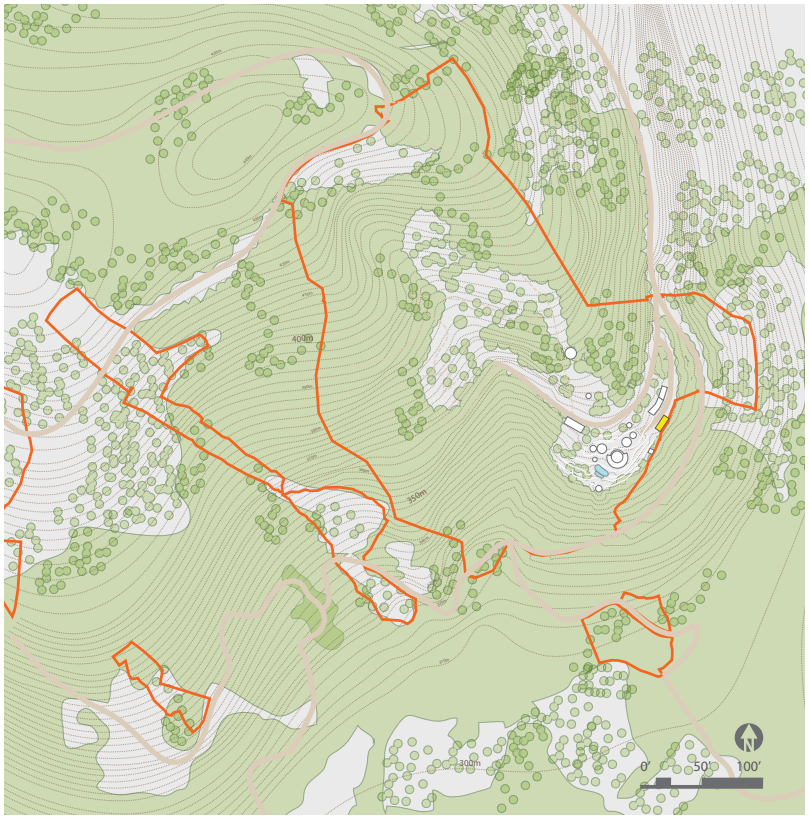
Η παρούσα συμβουλευτική λίπανση αγροτεμαχίου προκύπτει με βάση τα εργαστηριακά αποτελέσματα του δείγματος που προσκομίστηκε και αναφέρονται στο παρόν πιστοποιητικό και είναι ενδεικτική για την αναφερόμενη γενική καλλιέργεια. Ενδέχεται να απαιτούνται προσαρμογές λόγω των παραμέτρων της ηλικίας, της καλλιέργειας, του τρόπου φύτευσης, των κλιματολογικών συνθηκών ή άλλων ιδιαίτερων παραμέτρων που μπορεί να αφορούν το συγκεκριμένο αγροτεμάχιο.

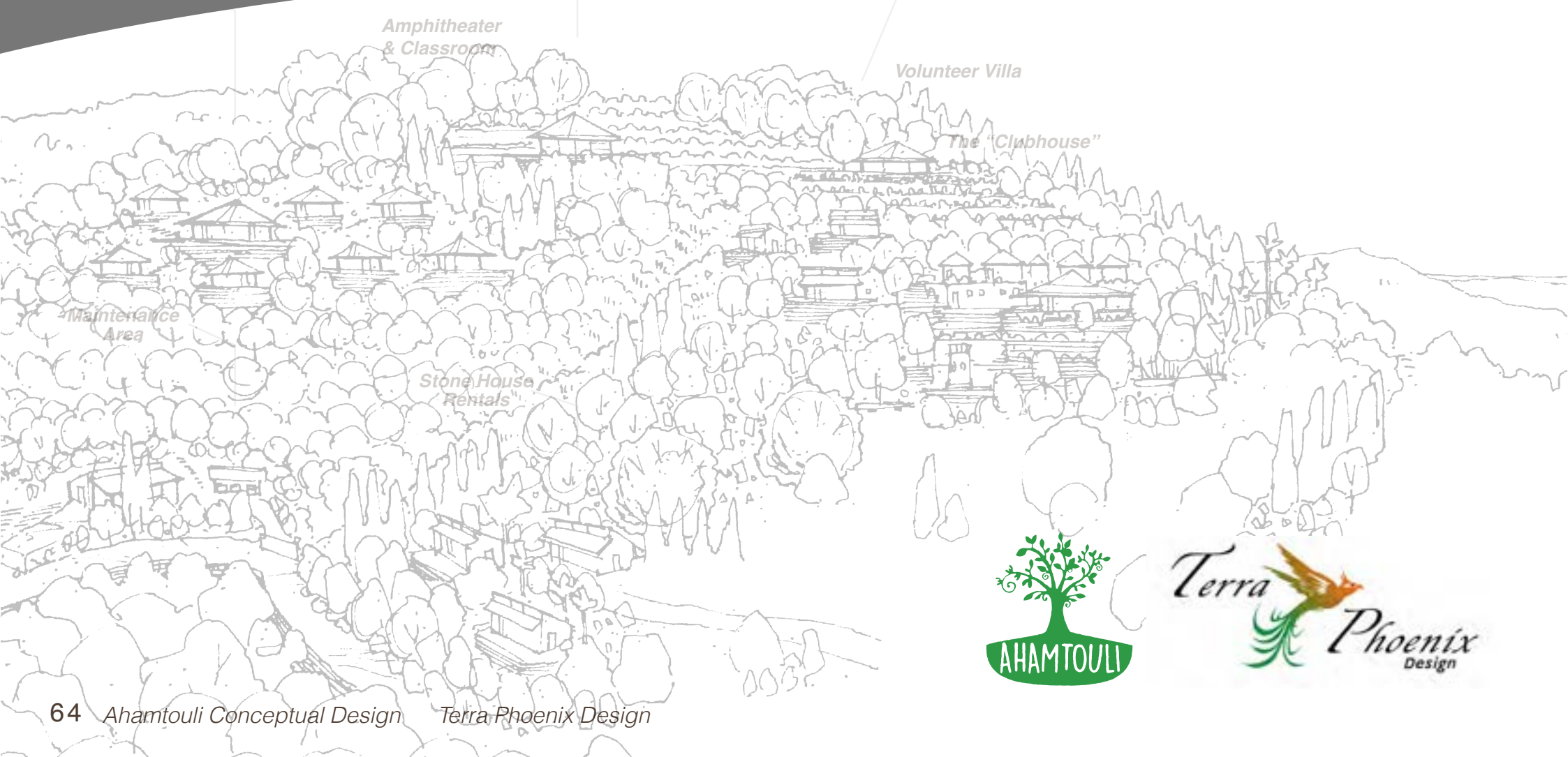

AHAMTOULI CONCEPTS
ILLUSTRATIONS
CLUB HOUSE
OUTDOOR KITCHEN
OUTLYING PARCELS + BELOW
DETAILS
DRIVERS
PARKING SHED
ORCHARD
GRAPES
YURT / PLATFORM
TO SOLAR HOUSE


AHAMTOULI CONCEPTS.
HIGH WATER STORAGE
- 4,000 cu METERS
- SITED AT TOP OF GRAPES.
OUTDOOR CLASSROOM
- DRY, SHADED, FOREST, AMPHITHEATRE.
- SEATING FOR 10-20-50 (80).
CABIN RENTALS.
- SMALL UNITS, BUILT ON TOP OF CISTERNS.
- AMENITIES SHARED IN COMMUNITY BUILDING.
- INDEPENDENT SYSTEMS.
- GLAMPING
HIGH WATER STORAGE
NUT ORCHARDS
PEMA AREA
AG. EXPANSION
OPEN OLIVES
MAINTENANCE AREA...
VOLUNTEER VILLAS.
MAIN TRAIL, UTILITIES.
AG EXPANSION.
WINDSCREEN/ HEDGE.
OUTDOOR KITCHEN
MAIN GARDEN
MAIN ORCHARD.
PARKING
STONE HOUSES.
VOLUNTEER VILLA.
- SIMILAR TO CABINS
- FOR LONG TERM HELP
- SENSE OF COMMUNITY.
VEGETABLE GARDENS.
- INCREASED FERTILITY + PRO.
- SEASONALITY ADJUSTED PLANTINGS.
- MIXED ANNUAL + PERENNIAL.
- SCREEN + HOOP HOUSES.
STONE HOUSES.
- BUILT ON TOP OF CISTERNS.


VOLUNTEER VILLA
OUTDOOR CLASSROOM
AHAMTOULI
CONCEPTUAL DESIGN
(VERSION 1.7)

DESIGN NOTES




Amphitheater
& Classroom
Volunteer Villa
The "Clubhouse"
Maintenance
Area
Stone House
Rentals