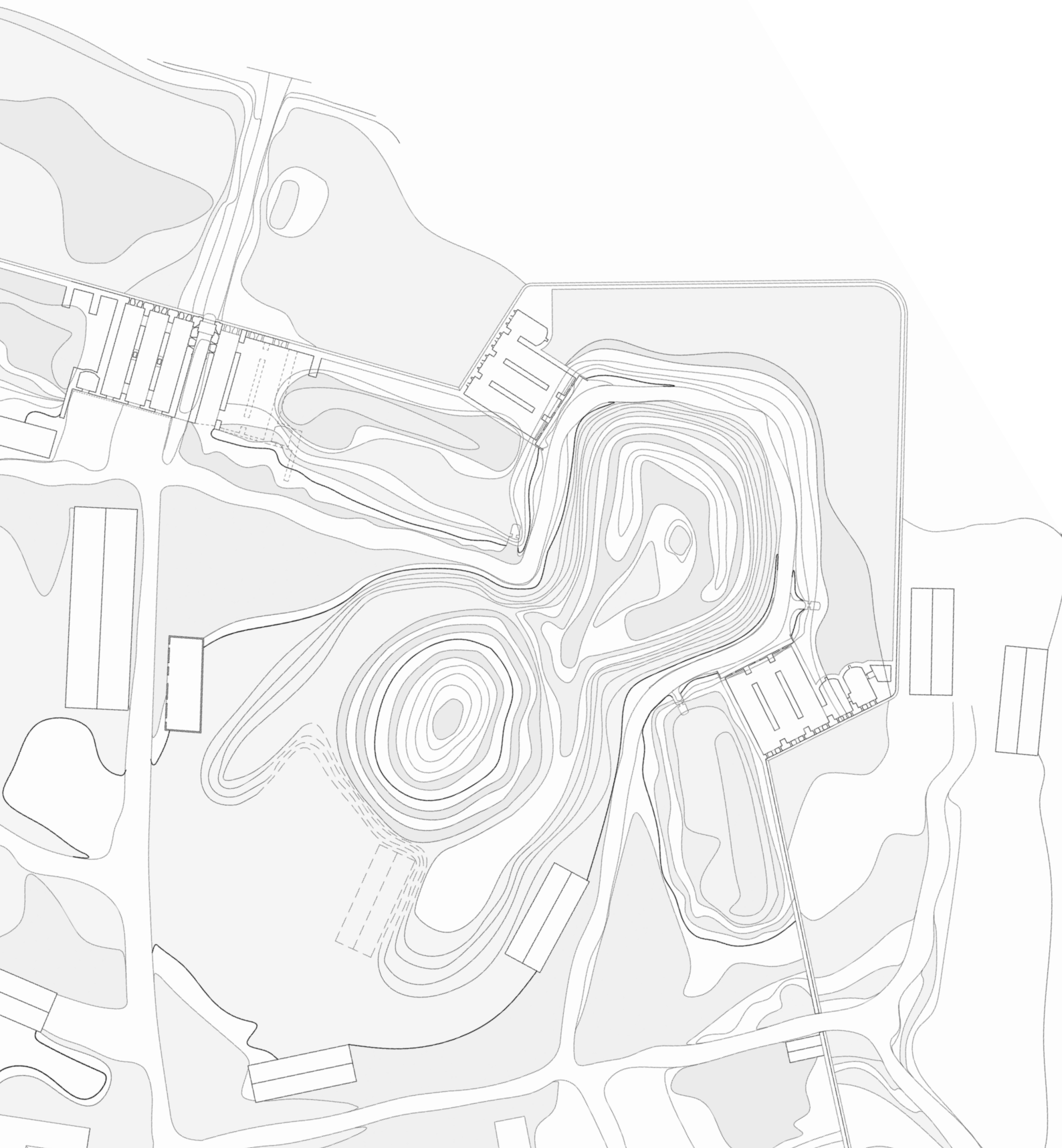

Forte di Pietole

–

"Reading destruction as a form of Design"

Thesis Proposal of the Masters in Architectural Design and History 2019-2021
/Politecnico di Milano, Mantova Campus.

Marc Abdo
Prof. Antonio Longo
Prof. Chiara Geroldi
Prof. Francesco Fassi

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Introduction

/historical and geographical dissertation

Forte di Pietole is a military structure located in the municipality of Borgo Virgilio, in the province of Mantua . It was built in 1808 by the French general François de Chasseloup-Laubat , envoy of Napoleon, who built it at the same time as those of Belfiore and San Giorgio to defend the nearby city of Mantua.

Given its proximity to the Mincio river , it was possible to regulate its waters from the fort in order to flood the area south of the city, isolating it. Forte Pietole is a vast military structure located in the municipality of Virgilio a few kilometers from the city of Mantova.

The site, spread over more than 300,000 square meters, has been built since 1802, the period of French occupation of the Mantova area, throughout the nineteenth century. Used first as a defensive garrison to protect the south side of the city of Mantova and then as a weapons depot and military equipment, it has witnessed more than two centuries of history.

The value of Forte Pietole is measured in proportion, in the absolute complexity and completeness of the defensive structure articulated on various levels, in the good state of conservation of the site, in the natural environment that surrounds, in its historical memory. In addition to what has already been described, in neighbouring areas to Forte Pietole is Andes, the birthplace of the Latin poet Virgil, who had the family land there and was inspired in his poetic by the natural environment of the site, which is washed by the river Mincio and is a part of the park.

For all these reasons, from being the birthplace of Virgil to its past a a fortress, and because all the potentials, Forte Pietole deserve to be recovered, protected and brought to a new life.

After the annexation of Mantova to the Kingdom of Italy and the progressive dismantling of the defensive systems, the fort was initially included in the list of works to be removed from the group of fortifications and subsequently readmitted as a deposit for materials and ammunition. which in 1917 was the cause of the great fire that broke out between 28 April and 1 May and which led to the outbreak and consequent destruction of the great Austrian powder magazine which contained 280 quintals of black powder.

The fire greatly damaged the structure of the fort: the ramparts I, II and III suffered serious injuries, the roof of the covered road gave way in several places. However, the construction of new warehouses was preferred to the recovery interventions and the entire structure of the fort was definitively abandoned in 1983.

The Forte di Pietole or Forte Napoleonico is a fort that rises in the Municipality and was built in 1808 by the French general François de Chasseloup-Laubat, envoy of Napoleon, who built it at the same time as those of Belfiore and San Giorgio to defend the nearby city of Mantova.

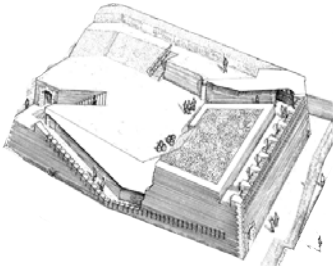
The fort enjoyed a massive fortified structure, defended on three of the four sides by large embankments and four bastions. Attached to these were the barracks for the defense of the nearby moat, which stretched along the perimeter walls.

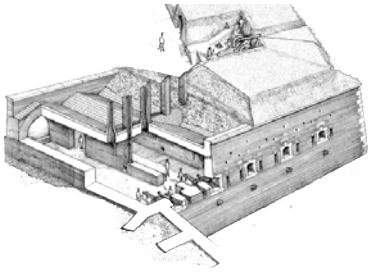
A covered road runs along its perimeter, which connects with the interior of the fortress in two points. Its peculiarity are the galleries that run below the fortification. In fact, there are some counter mines tunnels that, in case of need, could be mined and blown up, destroying the enemy forces above them. The Fort is now owned by the Municipality of Borgo Virgilio, which acquired it from the State Property.

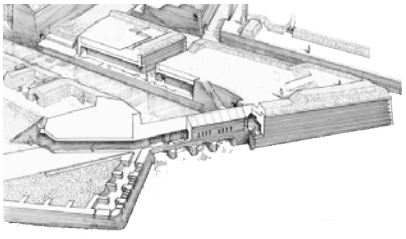
Regulation of the water around the bastions

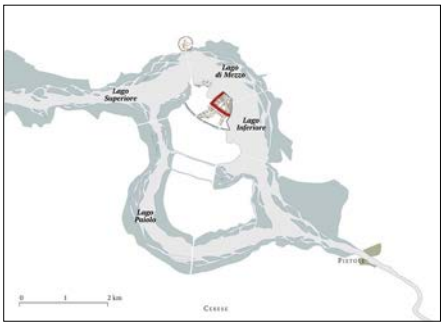
Walls of the fortress ystems

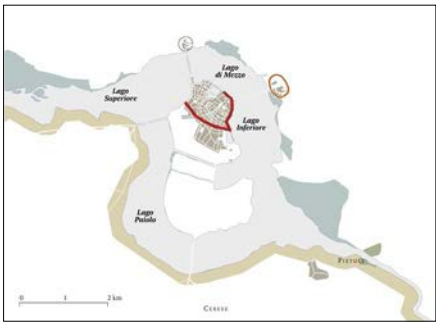
The dam at the gate of the fort











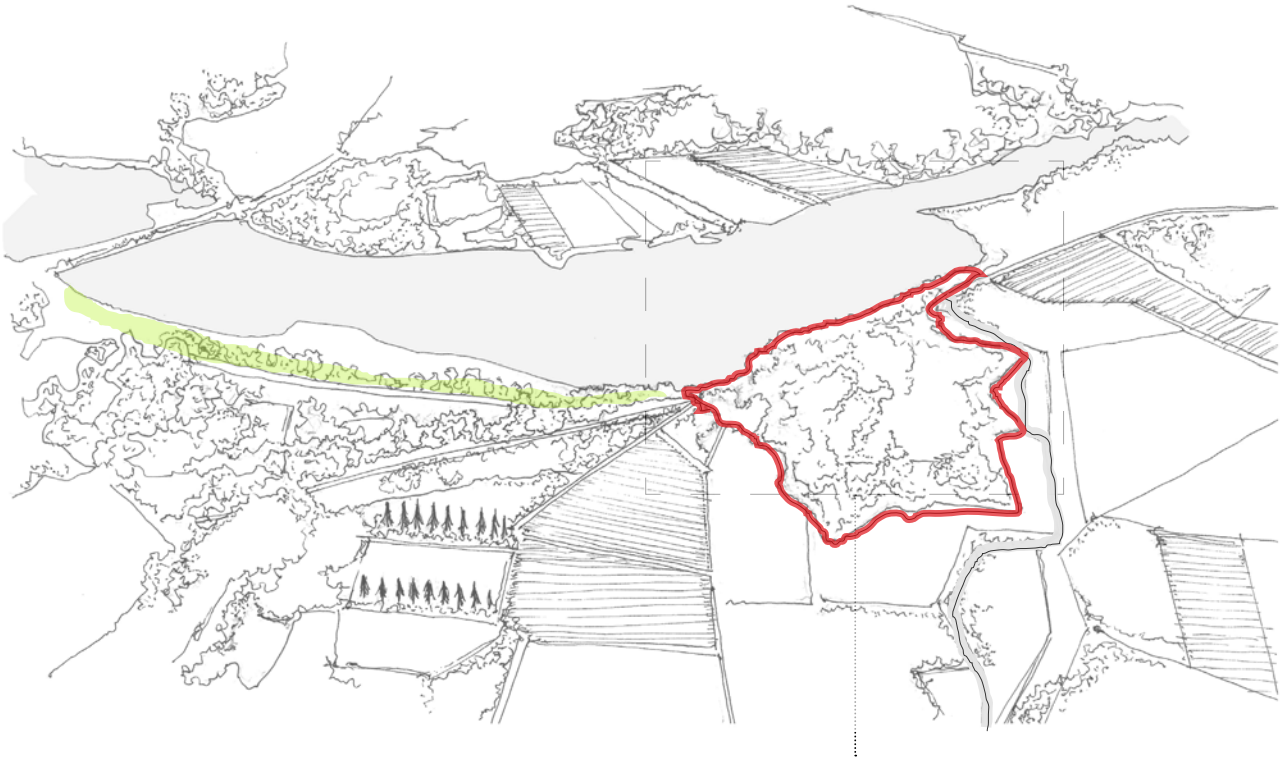
XI

XIV

[Narrative]

Historical Timeline

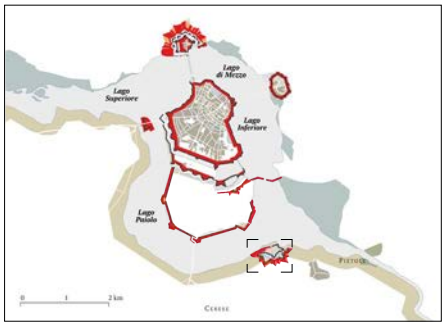
- Limits of the lakeside
- Water
- Urban Areas
- Fortress Systems
- Forte di Pietole



[Narrative]

Evolution of the fort

- Embankment
- Rivers and streams
- Forte di Pietole



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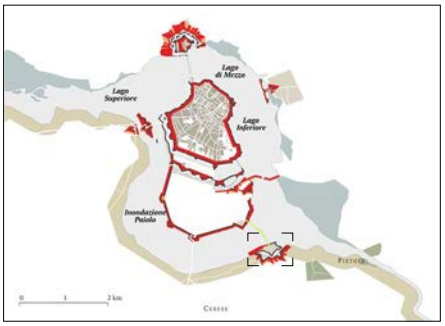

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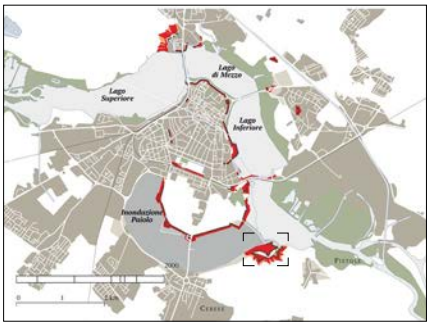
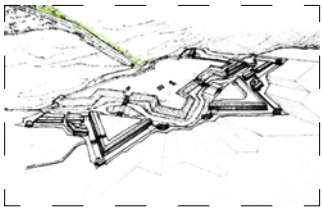
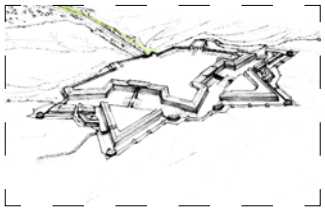


XX

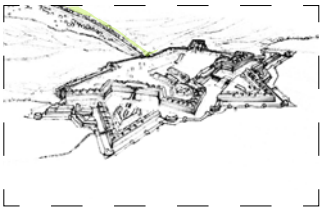
1815



1845



1866



1914

[a]

[b]

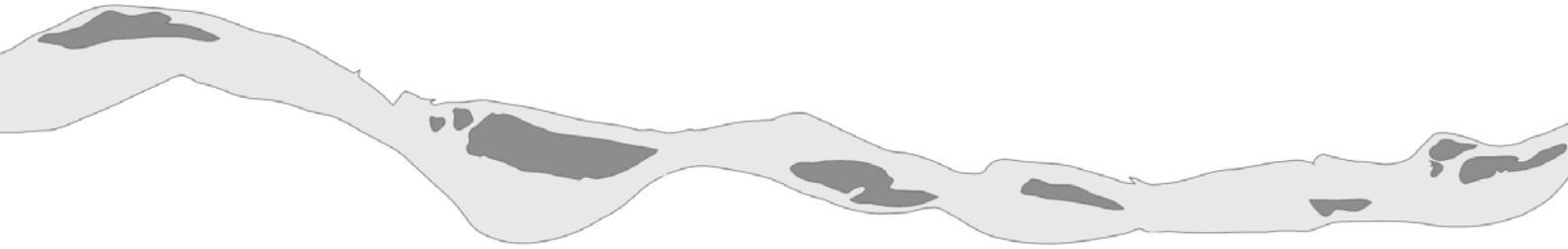
[Geographical Analysis]

Fortress around waters

[a] Map of the origins
[b] First settlement of the fort (1815)

Limits of the lakeside
Water
Aquatic vegetation
Fortress Systems

Main division lines
Forte di Pietole



[Narrative]

Conceptual Approach

/natural hazards as designers

The visitors will grasp the essence of this approach by observing the co-existence of both the man made structures, abandoned and destroyed, and witness the driving force behind the natural growth of the grass, mold and other organisms on the existing walls and wooden structures, gradually getting consumed by its eco-system.

These micro-organisms thrive in areas like that, they find all the resources they need in the rotten and moist wooden pillars and beams to expand and colonize the "dead" element.

This particular case in the opposite of what we perceive, a broken wooden structure is prone to absorb more water from the rain and therefore hold a huge amount of the fuel of life, then given the right conditions, funghi, weeds, and other vegetation grow in great abundance in areas like that, which makes this mentioned element more alive than when it was serving it's actual purpose of holding the structure of the roof, and goes on to serve its new purpose: a habitat.

The fort is an inventory of destruction, the paths in between the old existing architecture is merely a stroll in a museum of abadonned military architecture with the vegetative growth that has spread all over and around the abadonned elements.

The main concept of this proposal, is to witness this beautiful mix between destruction and the organic growth that follows, feeding from the decay of the existing elements mixed with some natural composites, and eventually creating this astonishing mix between nature and architecture. With the death of its previous function, the fort undergoes a new batch of new life introduced by the arbitray blend of the existing natural components and the ingredients used in the man-made structres upon destruction.

/ chaos follows order

Destruction is the active agent behind the design of this project. Destruction is the artist behind the design of the project. Destruction is an unmistakable designer. Destruction is a chaotic manifestation that will furnish the creation of this project. Destruction is the architect, the protagonist.

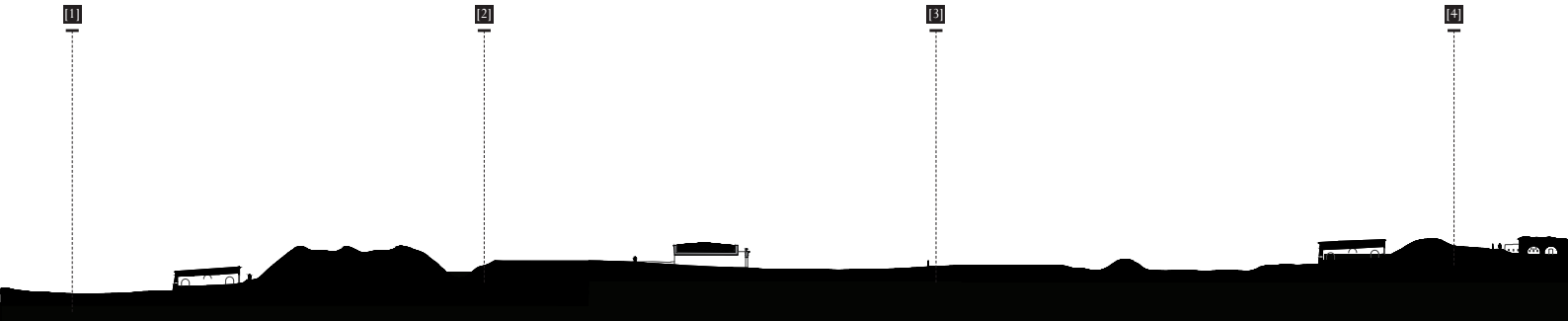
There are no choices to be made, the existing parts will remain, the original planning stays, the authenticity of the Forte persists. Hypocritically, Chaos follows a certain order, there is always a quantum coding behind the demolition of an entity. When glass shatters, what seems to be a random dispersion of the pieces is in reality an act of many physical phenomenons such as gravity, reactive forces from the ground and other factors that behave in-cognitively to obtain the observed result.

The damages that affected the elements of the Forte will now be considered a fortunate event that provides the blueprint of the newly designed post-apocalyptic spaces.In the first approach, where to Forte is left more or less untouched, the visitors go around the area during visits and manage to observe the piece of art produced by destruction.

The theme of this exhibition is the art that goes behind the organised chaotic expansion of natural organisms on destroyed man made elements. After the fire, between the additional carbon in the soil and the defragmentation of the architecture, new species of plants, birds and insects were welcome into the Forte.

This is part of nature's way of maintaining its life cycle, and this is clear when living the fort's experience. It is alive, more than it's ever been, tomorrow than today, which support the second approach which considers a intervention in the Forte.

Photos of the entrances showing the dominancd of the vegatative expansion on the existing structure.



* destruction

Noun;

de·struc·tion | \di-str’ək-shən

[Definition of destruction]

The action or process of causing so much damage to something that it no longer exists or cannot be repaired.

/Synonyms

annihilation, decimation, demolition, desolation, devastation, extermination, extinction, havoc, loss, obliteration, ruin, wreckage.

\Antonyms

building, construction, raising.

* damage

Noun;

dam·age | /ˈdamɪdʒ/

[Definition of damage]

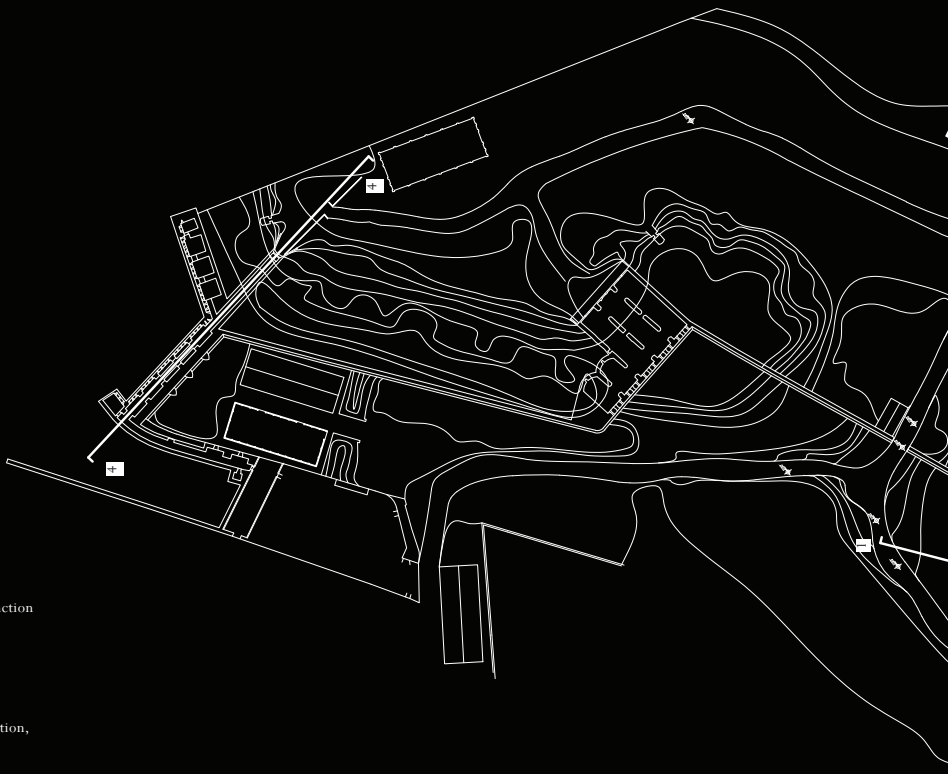
The physical harm that impairs the value, usefulness, or normal function of something.

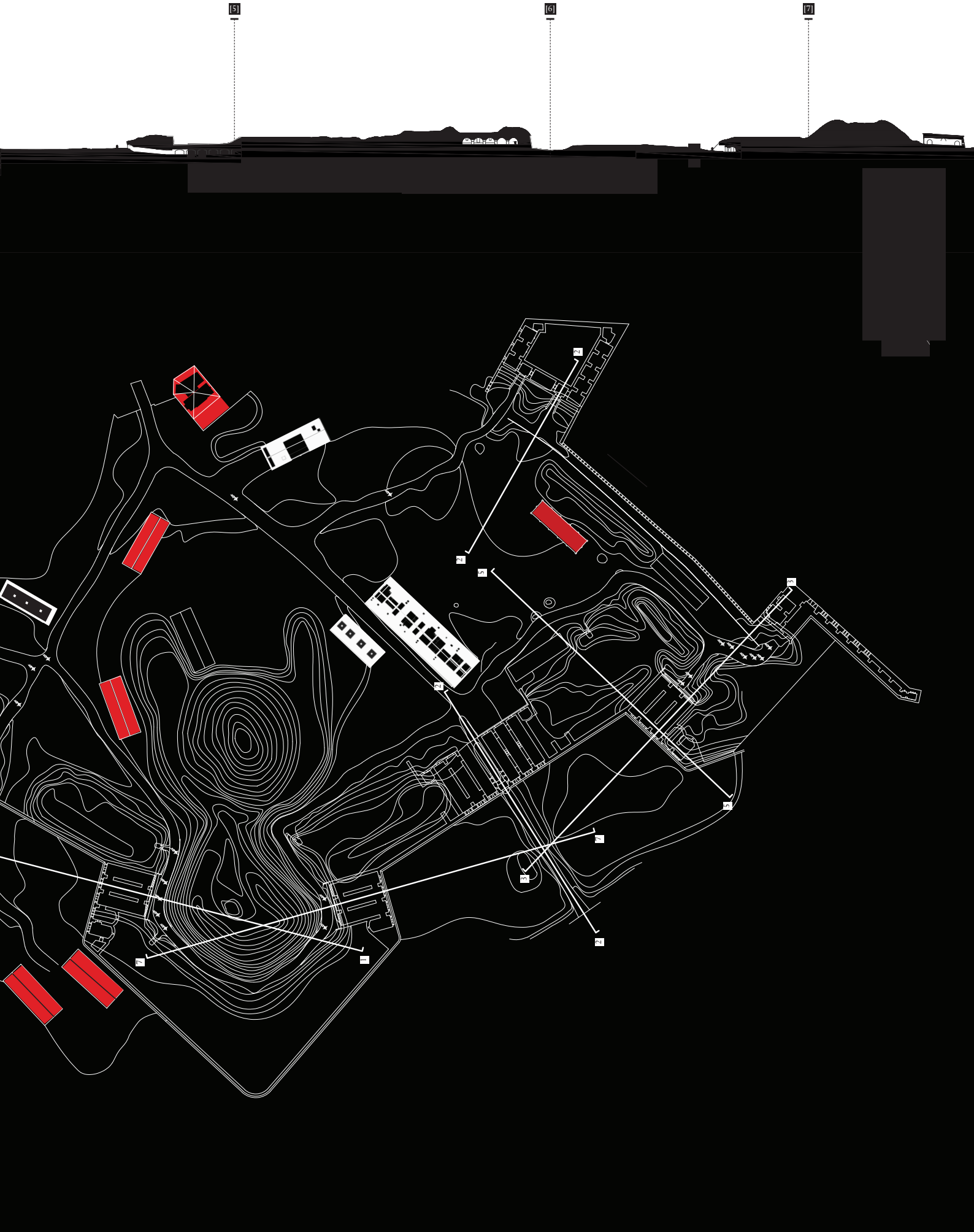
/Synonyms

affliction, detriment, harm, hurt, injury, disservice, injustice, mutilation, defacement, disability, disablement, disfigurement, impairment.

\Antonyms

remodel, enrich, refine.




[5]
[6]
[7]

[First Conceptual Approach]

Forests after Fire

/pyrophitic plants

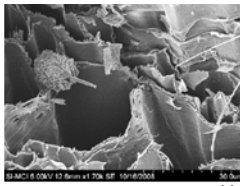
"New functions could only be maintained by a brisk metabolism in which each intake of food was preceded by digestion and elimination".

While humans and other animals still stand a chance to escape as they can move physically, plants have nowhere to go. Thus, nature has equipped them with special mechanisms to survive such fires. Plants growing in areas with low and high fire regimes often have adaptations to help them resist death due to fire. Such plants are called fire-resistant plants or pyrophytes. Pyrophytes are plants which have adapted to tolerate fire.

Pyrophytes can be of two types, "active pyrophytes" and "passive pyrophytes." The former can withstand fire and have volatile oils that encourage the incidence of fires as it is beneficial to them. The latter resist fires and can easily outcompete less-resistant plants after the fire dies down. Plants that need fire to complete their life-cycle are called pyrophiles. This strain of plants proves the presence of a new lifeform, that has set a threshold for their existence and will start to expand all over the fort's territory by default programation.

WOOD

CHARCOAL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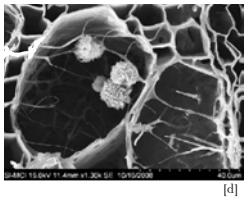
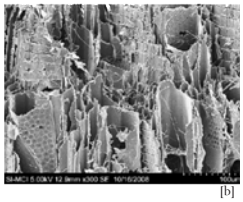
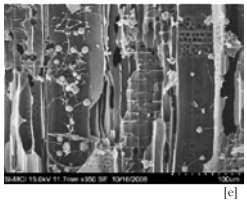
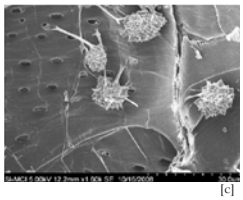

[d]


[b]


[e]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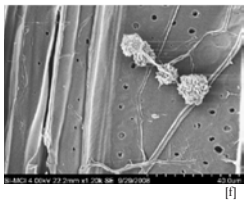

[f]

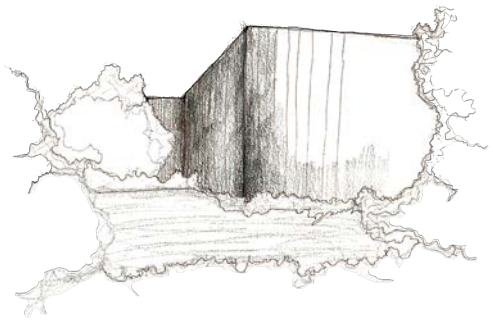
[a] and [d]: Transverse section
[b] and [e]: Longitudinal tangential section
[c] and [f]: Longitudinal radial section

Pyrophitic plants

(ref.)
"Preservation of fungi in archaeological charcoal"

M. Moskal-del Hoyo et al./Journal of Archaeological Science 37 (2010) 2106-2116; treating:

Wood charcoal
Fungal attack
Biodeterioration
Deadwood collection
Anthracology
Archaeobotany



[Narrative]

Chaos as a new habitat

/stages of succession

The forest is bursting with life. Cavity-nesting birds, reptiles, small mammals and even larger, such as bears, are scouting out new habitat in downed wood and snags, standing dead trees. High up on newly created perches, birds are feasting on millions of insect larvae. Black-backed woodpeckers, among others, are an "eruptive" species, thriving in response to an increased insect population build-up. Down below, plants and fungi are flourishing under the opened canopy, now sources of food that will benefit wildlife for many years to come.

For visitors to the forest, the burn areas can be hard to discern in many places. Standing snags and fallen logs provide a clue to a fire in the past. But surrounding this woody debris is thick growth made up of tall grasses, shrubs and wildflowers visited by plenty of pollinators and foragers. Logs that have fallen into creeks and streams create vital habitat for juvenile salmon aquatic species.

[types of plants]

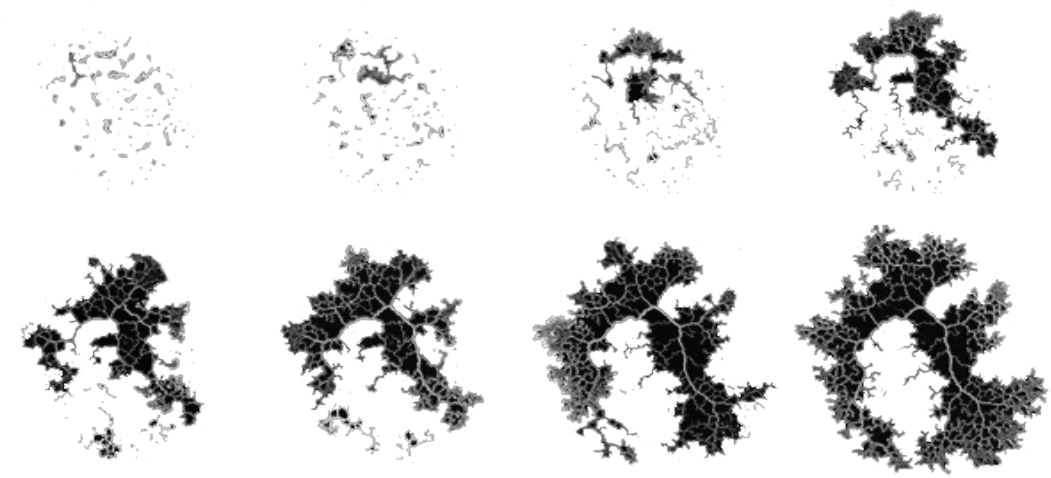
Ephemerals: The first plants to move into the new bare ground after a wildfire are wildflowers or "weeds." These fast-germinating, leafy herbaceous plants are also known as "forbs" or "ephemerals." They quickly germinate, grow and produce a new crop of seeds.

Grasses: Next, the grasses move in. Because grasses can withstand summer dry spells, and forbs cannot, they soon begin to replace most of the forbs. The grasses' root systems allow them to become dormant during extended drought. With each repetition of a drought cycle, grasses cover more ground.

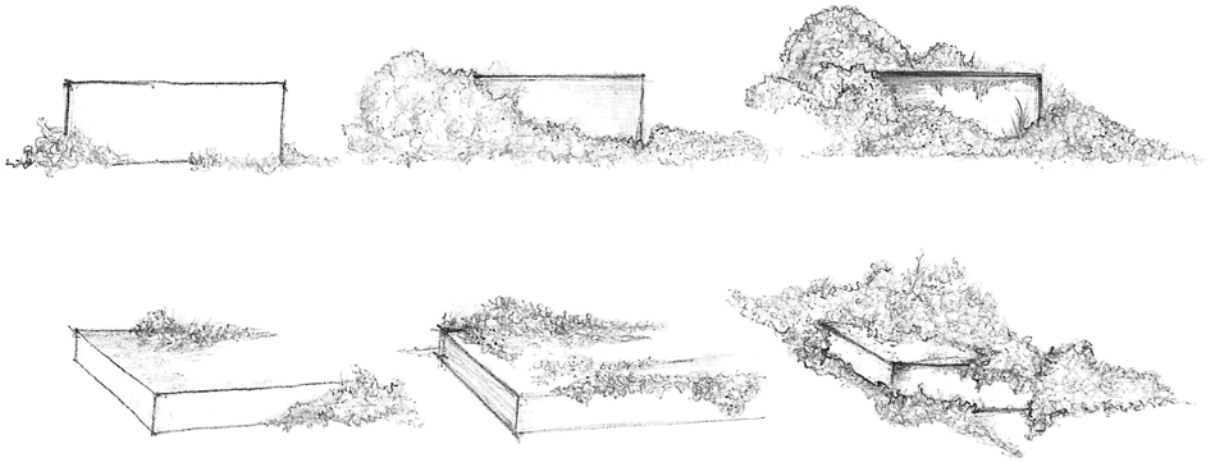
PioneerTrees: The next species to appear are called "pioneer trees." These are scubby, slow-growing trees that are unpalatable to livestock. They're able to mature at significantly reduced sizes in arid, nutrient-poor soils, under harsh conditions.

Scub Canopy: As the scrub trees become dominant, their crowns begin to form a thick canopy. In fact, it's not unusual for a single aggressive species of tree (such as mesquite or juniper) to predominate for years.

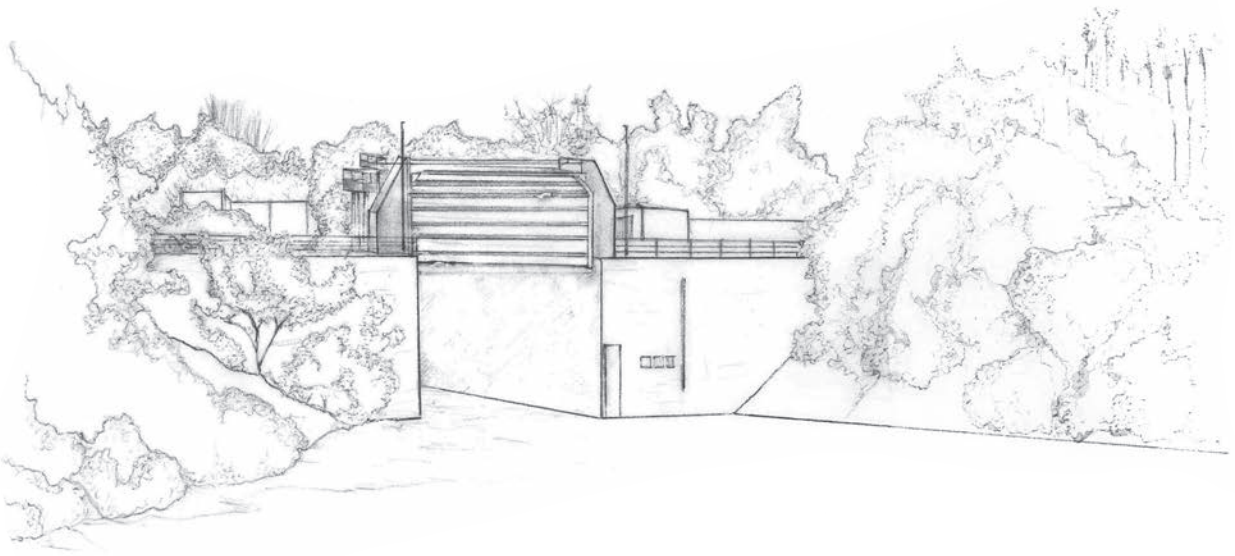
Climax Forest Begins: With these more hospitable conditions, taller trees and vines begin to move in. They could not have survived in the harsher environment which the scrub trees prefer.



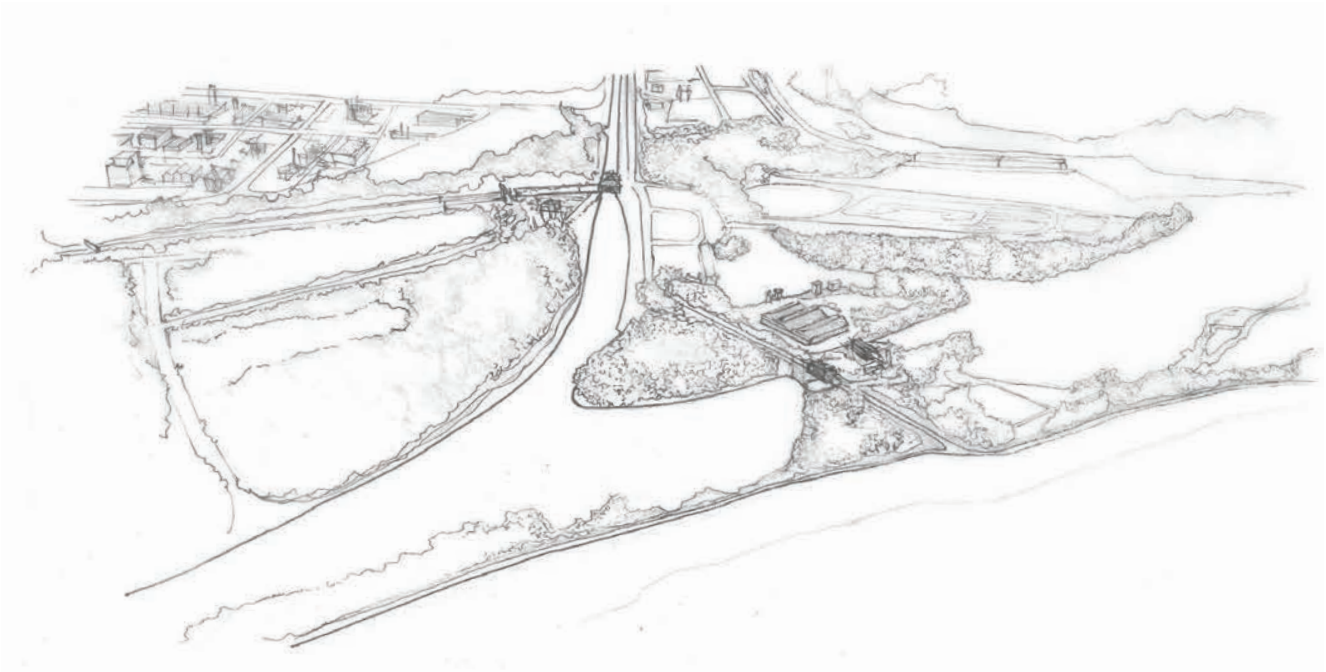
[Timeline of the vegetation's expansion]



[Vegetative growth on the architecture]



[Bird-eye view of the co-existence]



/manifestation of new life

Natural catastrophies are part of the earth's life cycle, the human species would not have survived if it weren't for the extinction of the dominant reptilian species, the carbon dioxide in the atmosphere caused by the eruption of the volcanoes that were theoretically activated by these meteorites, made the earth's surface a liveable environment for human beings who would then dominate the planet themselves and spread out all over the globe. On a more micro-scale, fires that happen in woods are a form of extinction for insects, plants and some birds. This ending, is a beginning for a new form of life, that would consequently find that environment more adaptable.

The destruction of man made structures, cause the broken wooden structure to aborb moisture from the rain and start growing many types of funghi, some weeds can find this a hospital environment, and so on. The cracks in the wall can welcome vegetation to grow in between them.

These forms of life would have never found their way if it weren't for these "accidents" that occur, and contribute to the creation of an entire eco-system. The abundance of new insects that live in such enironments would provide an enormous amount of food supply for the birds around the area and could welcome new volatile creatures to the area that would participate in it's new form of growth.

Flora and Fauna

[Flora]

Typha Latifoglia | Mentha Tremu | Craterium Leucocephlum | Populus nigra | Mentha Spicata | Fiori di Lotus | Typha

Populus Tremula | White Poplar | Populus Alba | Populus Nigra

[Fauna]

Airone Bianco

Woodpecker

Martin Pescatore

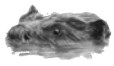
Nutria

Airone Cenerino

Branta Bernicla

Fagiano

Bee-eater



Coypu

Rabbit

Cormorano

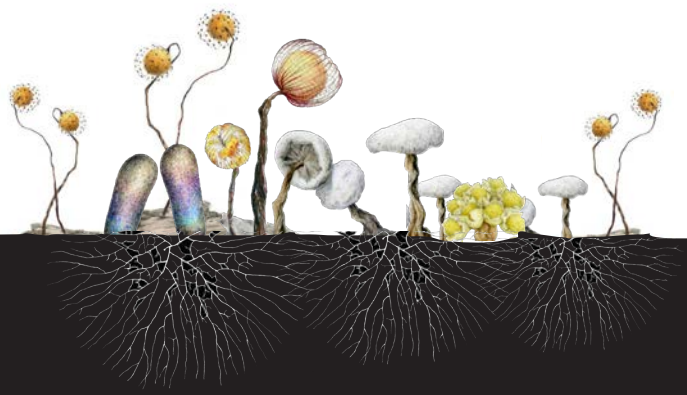
Frog

Latifoglia

Populus Tremula

Typha Latifoglia

[Funghi]



Introduction of the project

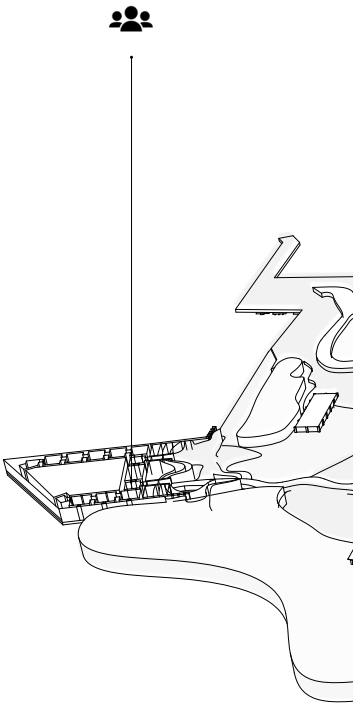
/the workshops

The firt approach towards re-using the fort is the organization of workshops that would take place between the Mantova campus of Politecnico di Milano and Forte di Pietole. In this intervention the fort remains untouched, and only removable equipement for safety measures will be installed in the areas where visitors would be welcome to observe the effects of the fire and destruction in the fort at a safe distance without the risk of falling items from the fragile roof.

The main intention is to put in evidence the natural invasion of the landscape on the existing structures after the catastrophe. This itself is a form of art, and it there to be seen, observed, studied and understood. The expansion of the vegetation and the cariety of species that roam around the fort prove that the fort is very much alive and this is a time for it to be witnessed.

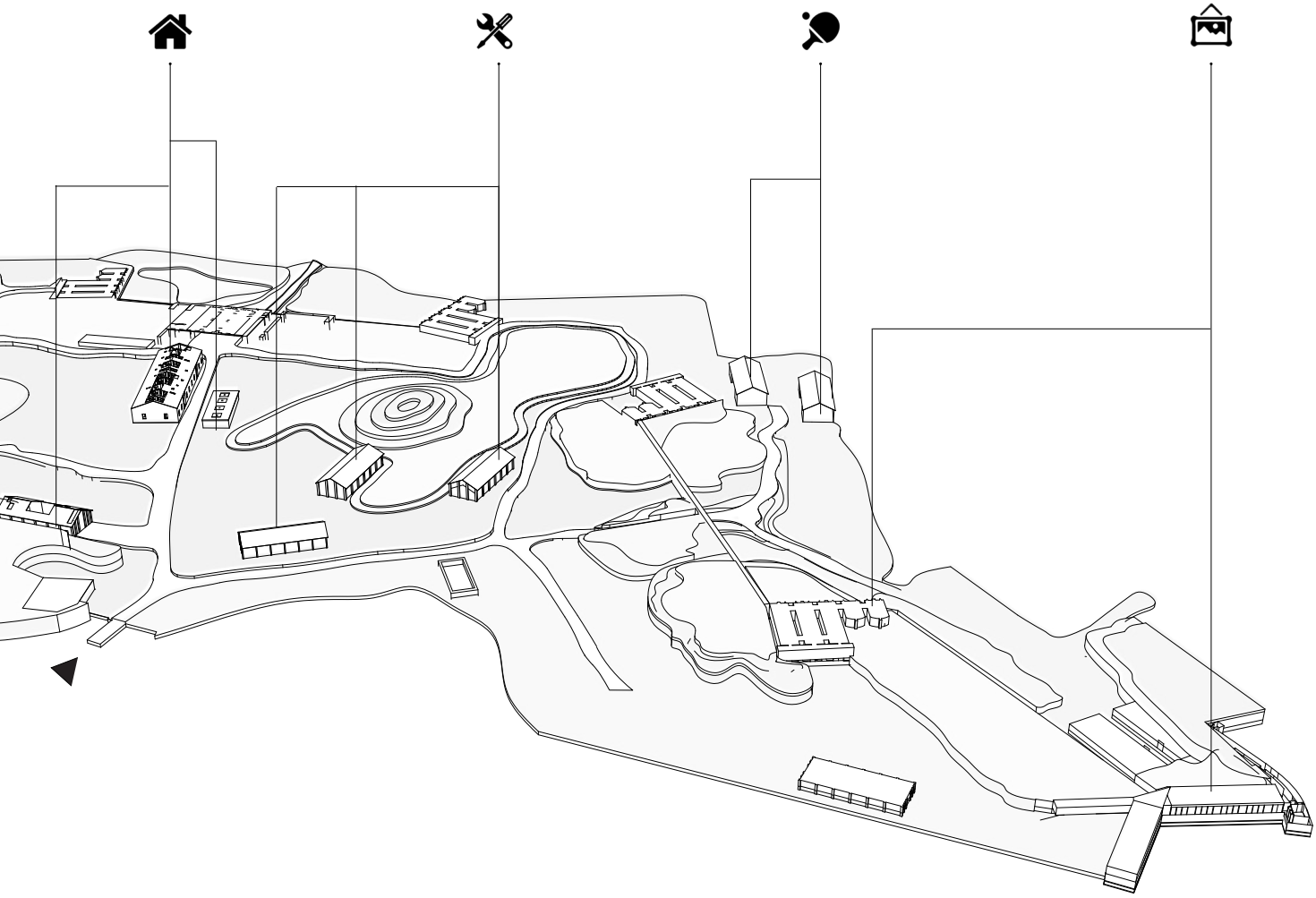
This intervention will lead to the next human interaction with the fort, but this does not the hurt the fort, this is part of the fort's life cycle where new materials introduced by us humans will, at their point of destruction, bring in another form of life to the area. In a way, what might seem like our participation to the damage of this eco-system, all that is happening is a build of an entropy of life, that will burst as soon as the correct resources are produced within them.

- Dormitory & Private houses
- Modelling Laboratory
- Sports hangars
- Exhibition & Presentation spaces
- Meeting areas and Community hubs
- Storage spaces for Food and Tools



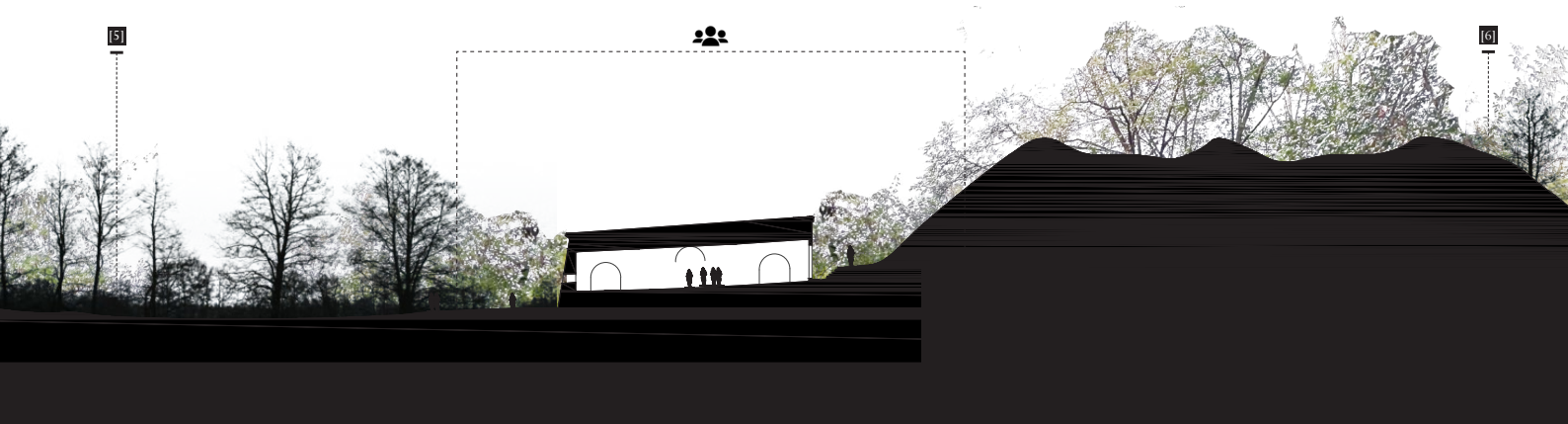
- Main circulation lines
- Entrance from the corresponding orientation
- Used territory
- Unused territory

Conceptual representation of the workshop spaces:
Observing the imprint of destruction, dormitory or display area (top)
Re-using the abandonned hangars, sports aream (top right)
Working with the hands, Indoor/outdoor woodcrafting area (right)



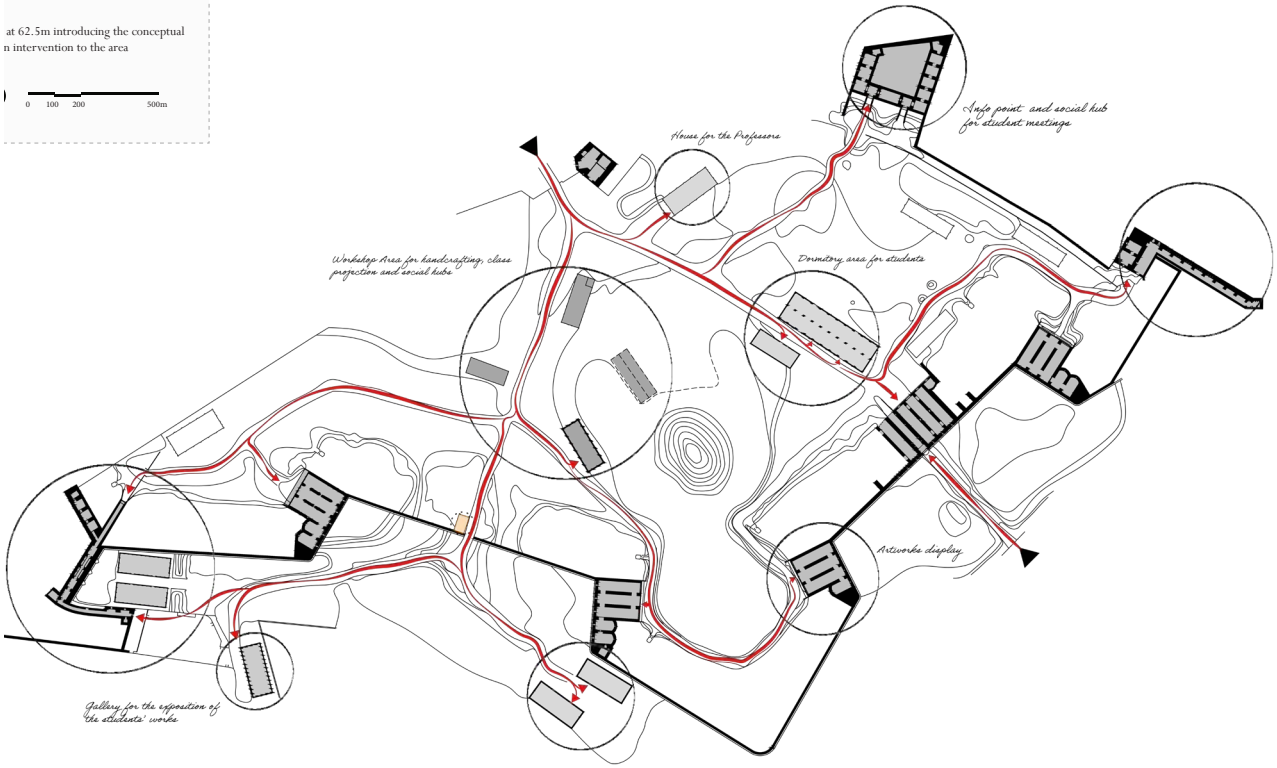
Isolated perspectivr of the area whilst putting in evidence the density of the vegetation, the limits and main paths inside the fort.

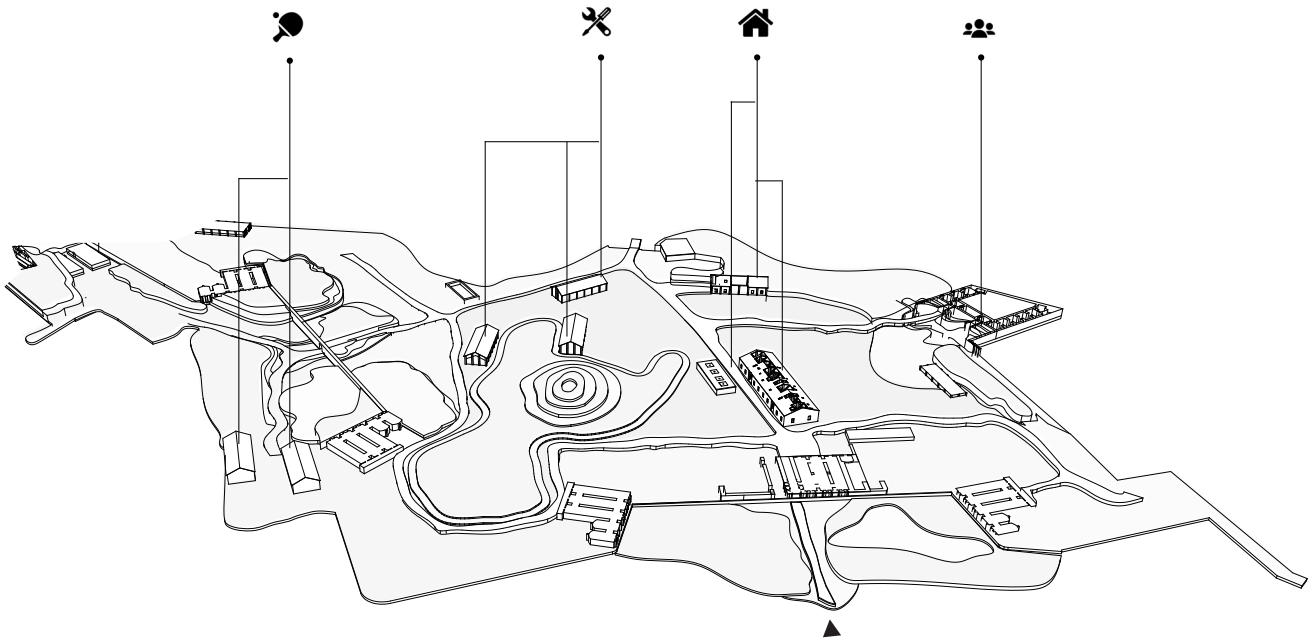
0 10 20 50 100m

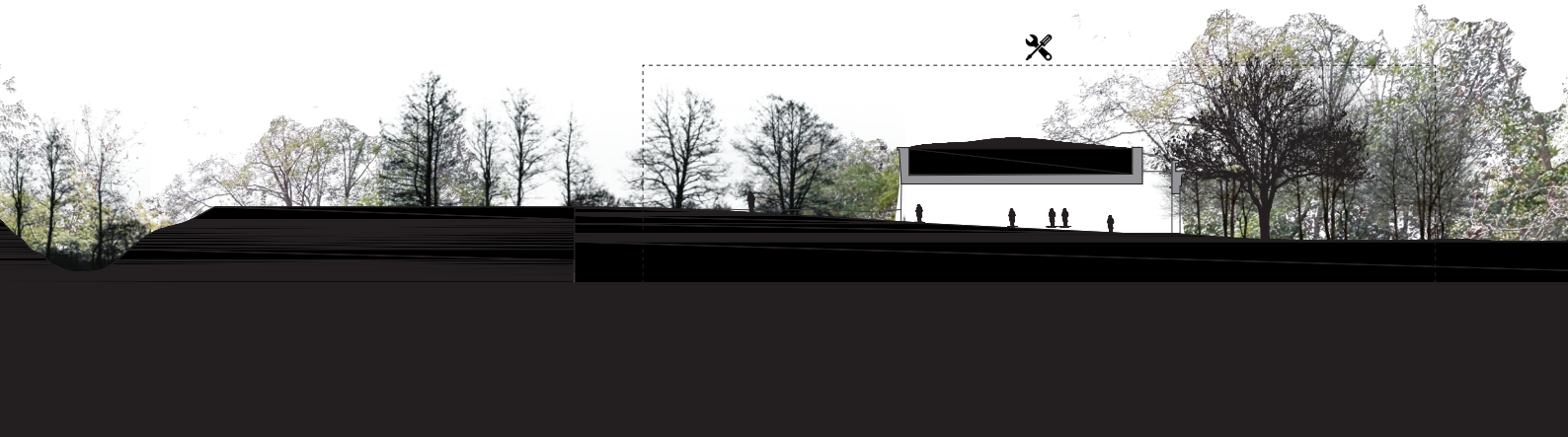


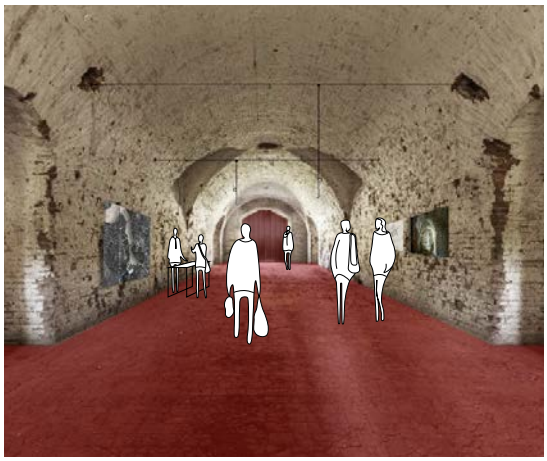
at 62.5m introducing the conceptual
n intervention to the area

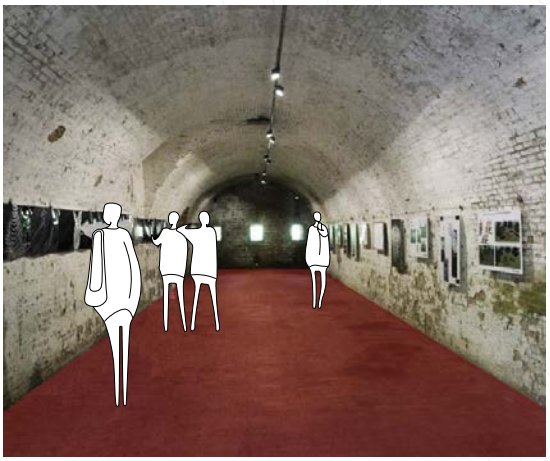
0 100 200 500m











Example of the workshop experience inside the spaces of the Fort.
Image of the exhibition area (Top) - Plan on Panel .7
Image of the community hubs (Right) - Plan [d] on Panel .6

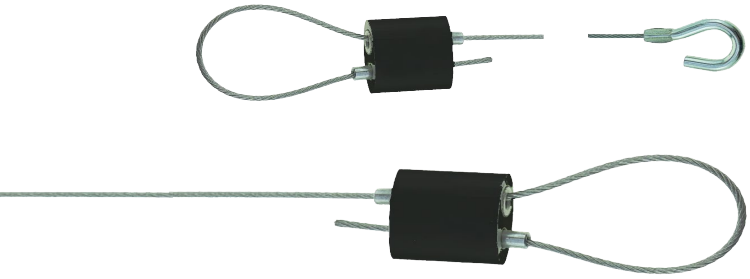
Treatment of the spaces

/workshop and exhibition space

The students will organize an exposition where they would present the works that they have don throughout the workshop. Students are welcome to hang their materials on the installed suspended panels. These spaces will be kept intact for the true feeling of the authenticity of the forte's cache, therefore, besides some cleaning, the removal of the vegetation growing between the stones and the some attention to the decay, the arcardes were pierced with very small steel hooks to hang the panels of display with very thin black steel wires. Alternatively, for better illumination, a longitudinal black steel bar holding the spot lights is installed on the ceiling of the arcade.

Mainly, the area will be used as a workshop area that hosts a group of people that can be students, whether they are still in school or in the university will depend on the program they have chosen, or adults that would like to participate in hand-crafting workshops to develop their skills or to take on new methods of modeling. The workshop will take place entirely in the Forte, which is an ideal space for isolation and inspiration for self-improvement and the development of crafting skills, the historical knowledge of the designated area and courses on museology and archaeological analysis.

The purpose of this activity is to have the students work on the theme of the untouched arheological spaces such as the one where this exhibition would take place, and display their results in the caves of the fort. In this approach the fort remains untouched with the interventions mentioned before that would go completely unoticed in order to respect the state of the walls, therefore the panels will be either suspended from steel cables (image below), the models will simply be placed on podiums and both will be assisted with the illumination of lamps (image on the right), with the consideration of the minimal electrical connections to the generator.

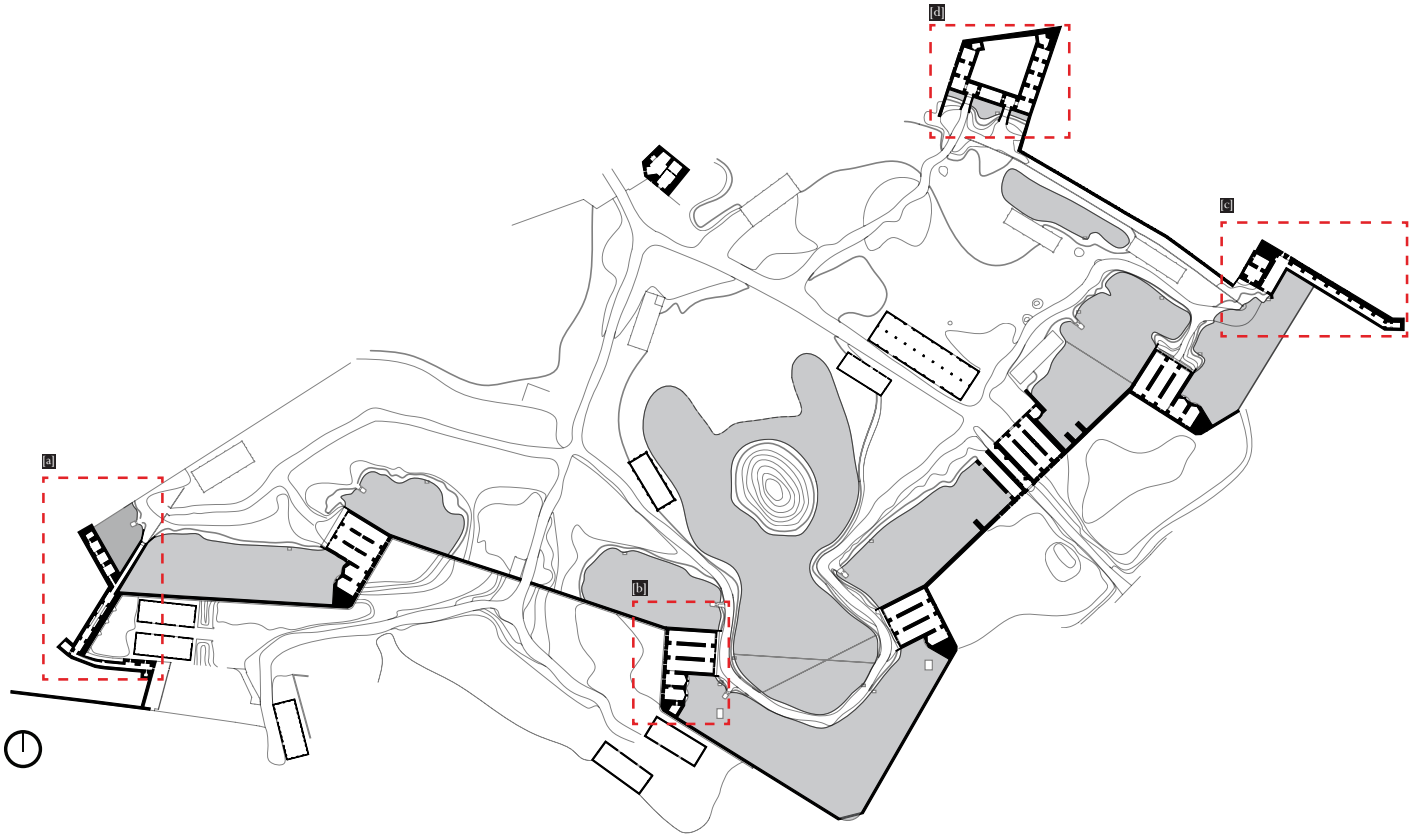


Light steel cables with black lock and detacheable aluminium hooks, used for the display of panels.

Lightweight projectors to be installed with a detacheable joint that gets hooked in the walls with very minimal intervention.

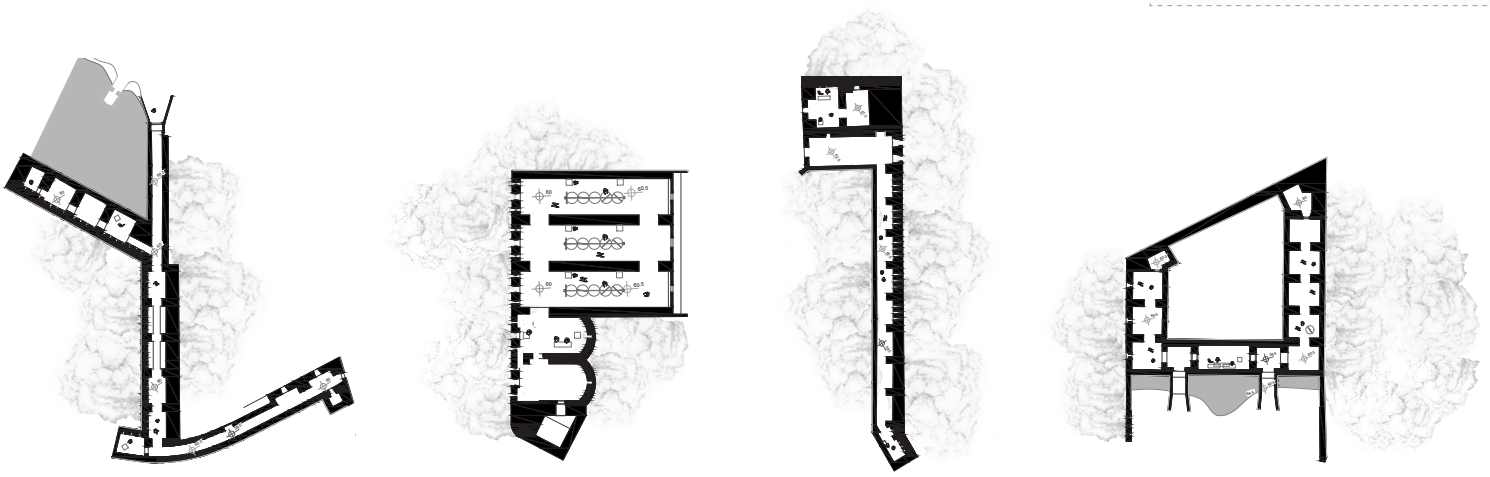
0 10 20 50 100m

[4]



[a] : First photo (left)
[b] and [d]: Second Photo (middle)
[d]: Last photo (right)

0 10 20 50



[a] [b] [c] [d]

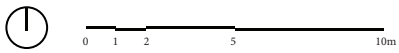
[5]

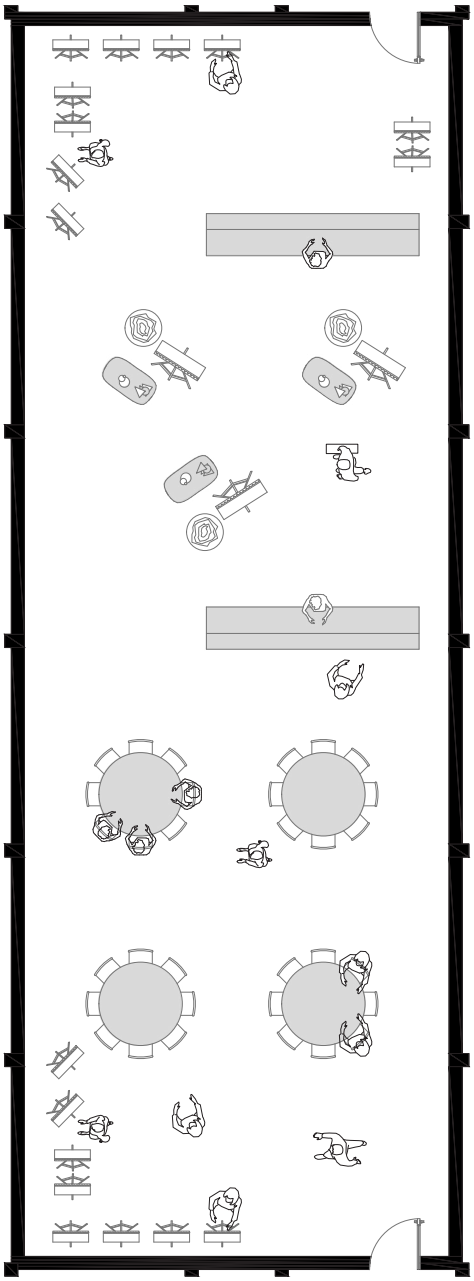
Workshop spaces

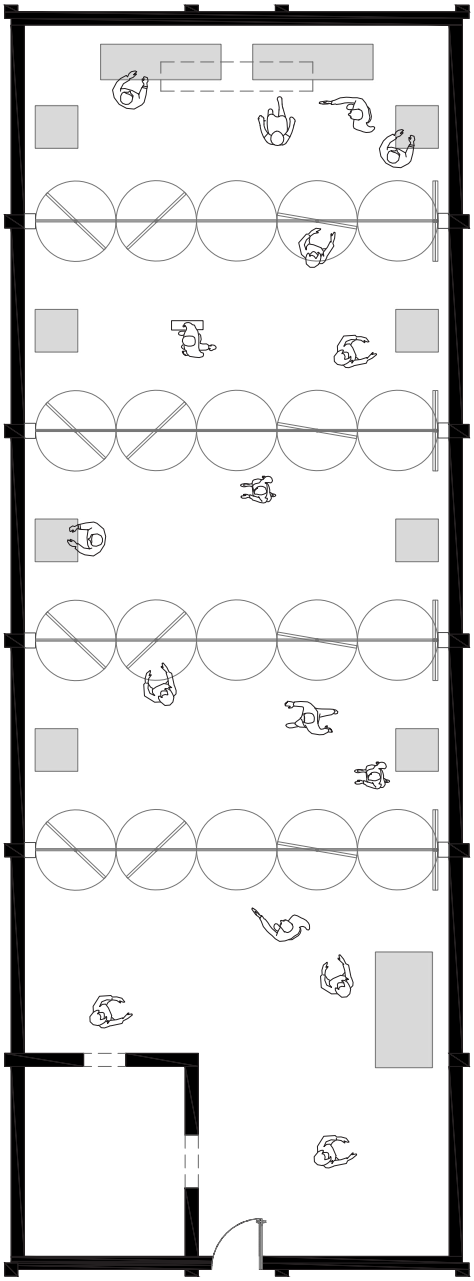
/abandonned elements

The hangars are the elements that resisted the most throughout the years and they can be considered almost completely intact. They will be mostly used as crafting and modeling areas where the guests will be provided with the proper equipment to experiment with the creation of wooden, concrete or even plastic maquettes.

Workshop area floor plan
Exposition space floor plan







Photos of the abadonned buildings to be re-used under the new functions of the project

[a]

[b]


13

Buildings in context

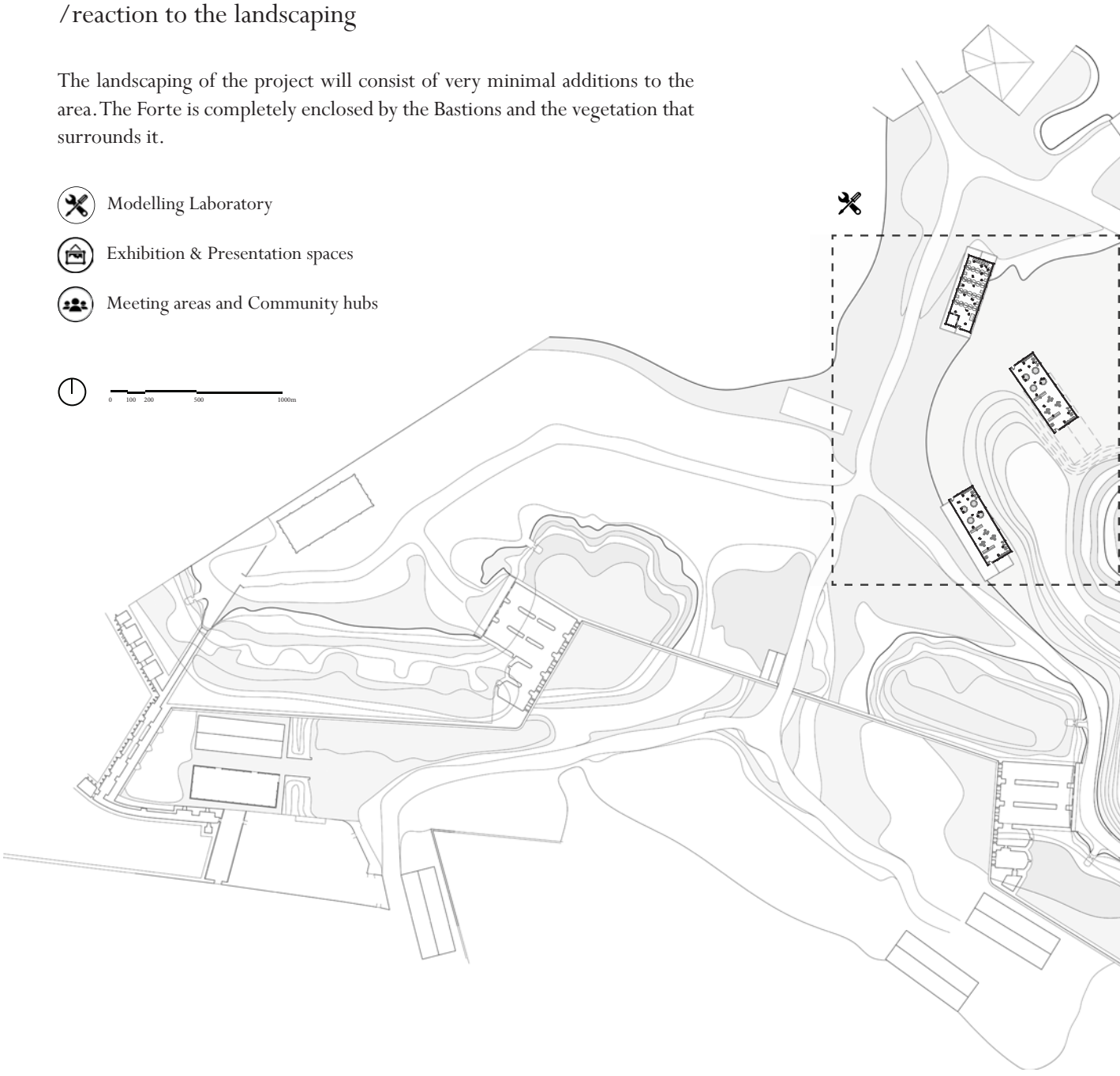
/reaction to the landscaping

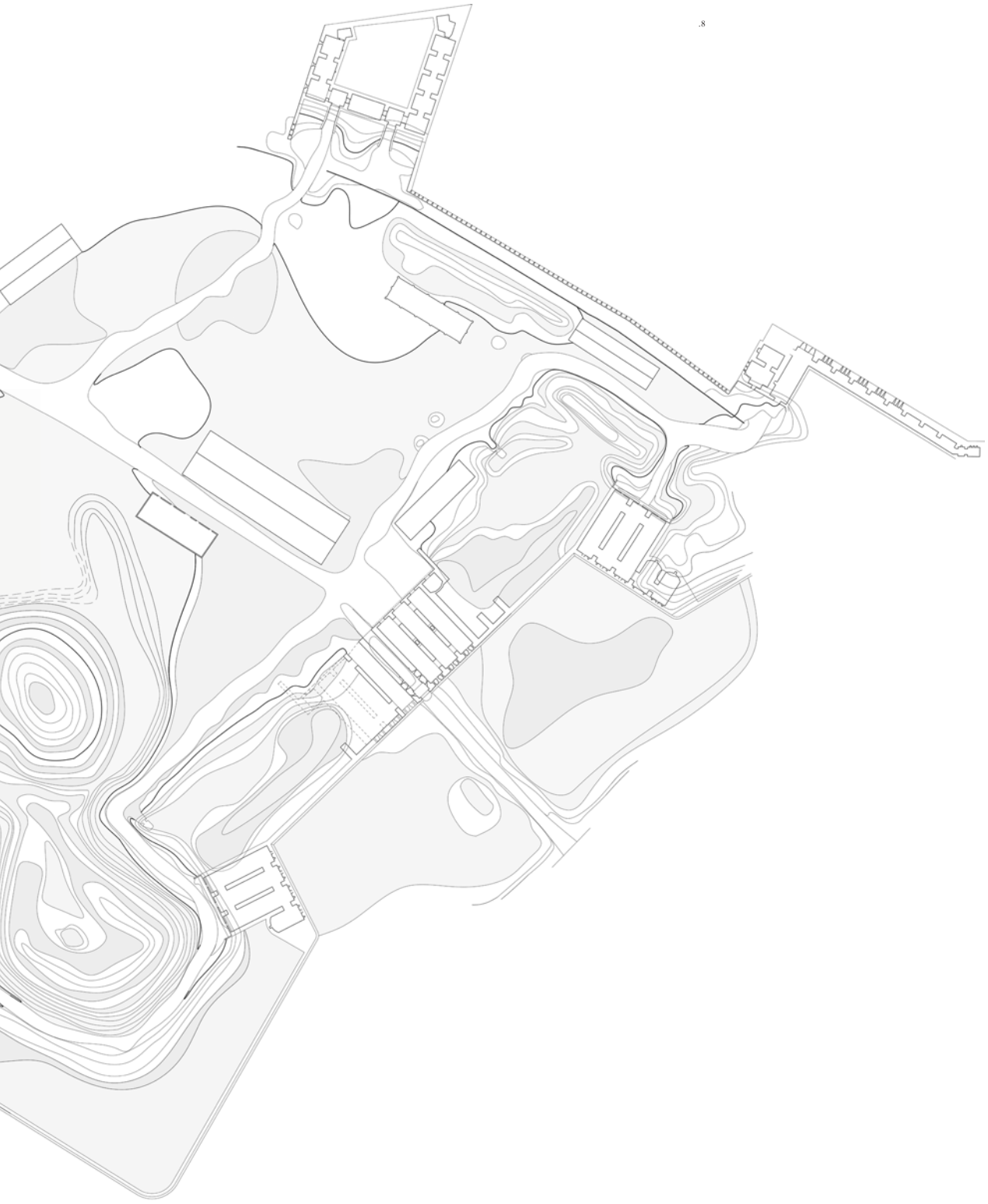
The landscaping of the project will consist of very minimal additions to the area. The Forte is completely enclosed by the Bastions and the vegetation that surrounds it.

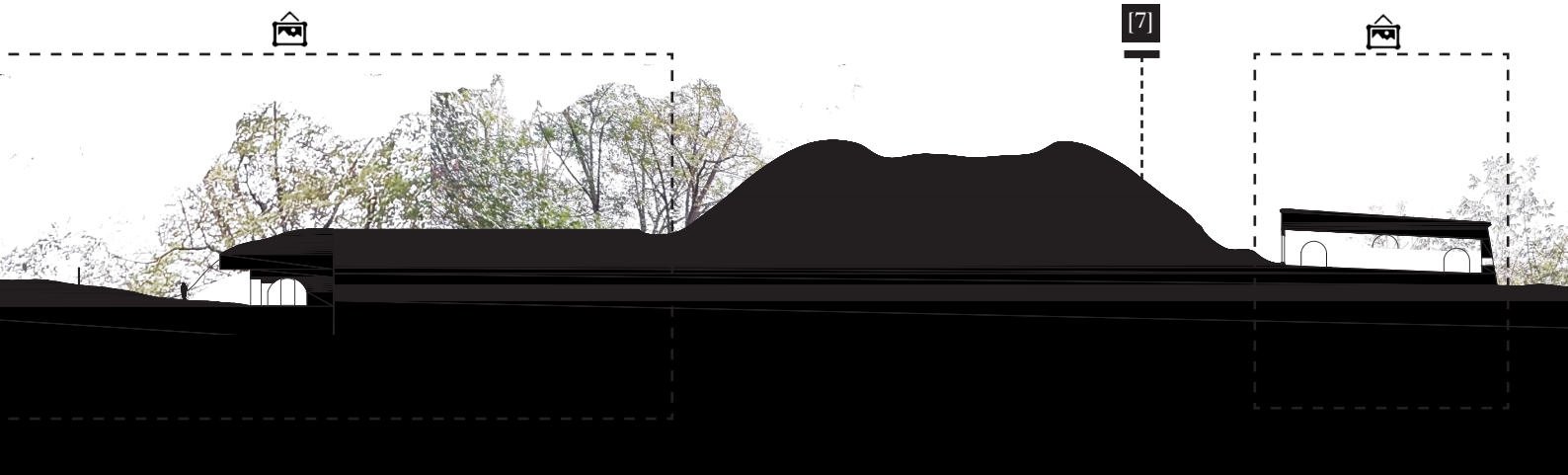
Modelling Laboratory

Exhibition & Presentation spaces

Meeting areas and Community hubs






[7]

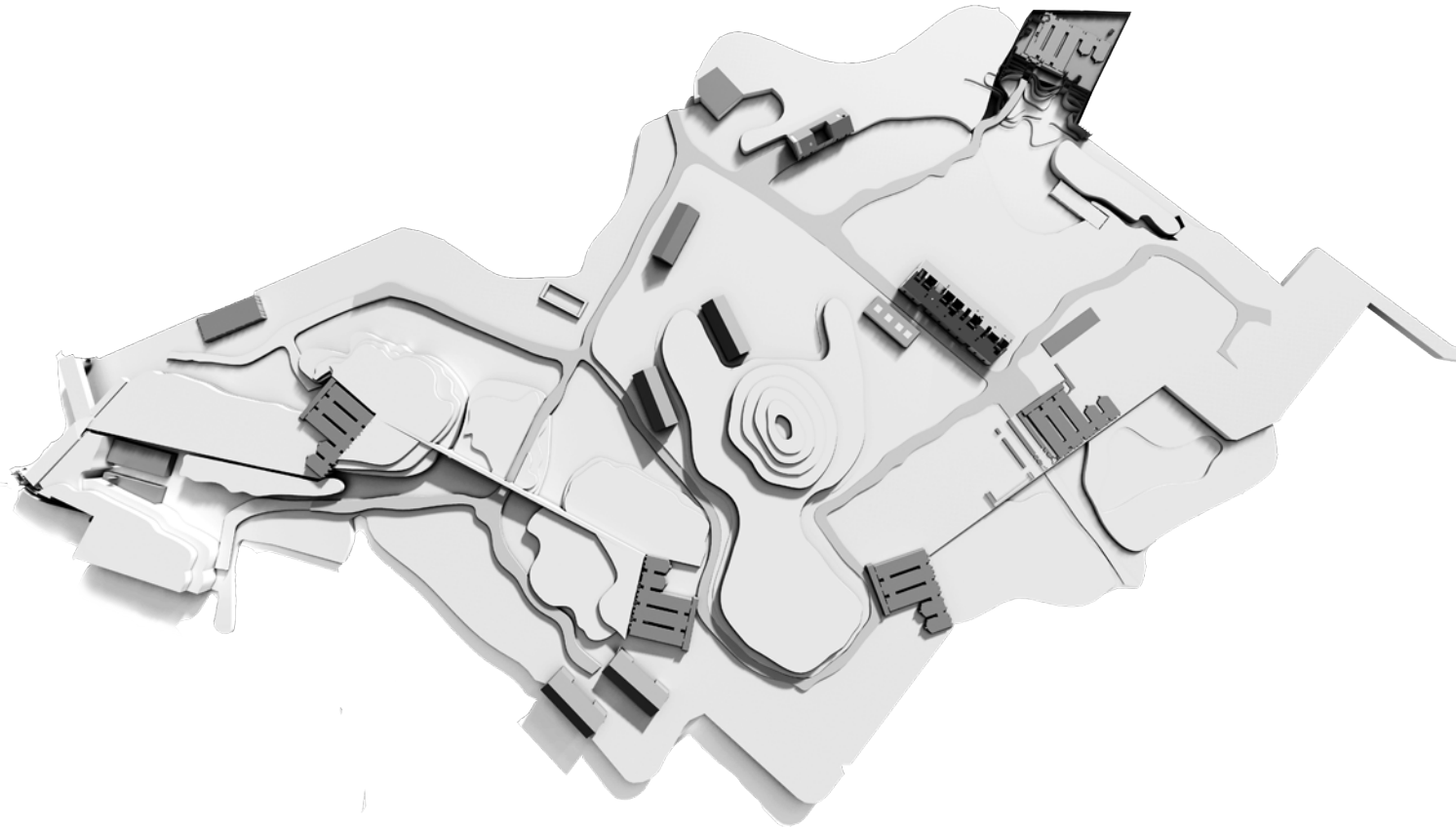
Imprint of destruction

/dormitory houses

The houses that have a bigger scale will be transformed into collective studio apartments for the students. Each compound will consist of 8 houses that will be managed according to their proper original plan whilst taking into consideration any damages done to the roof that will provide the houses with appealing sky openings that will define the functions of the houses.

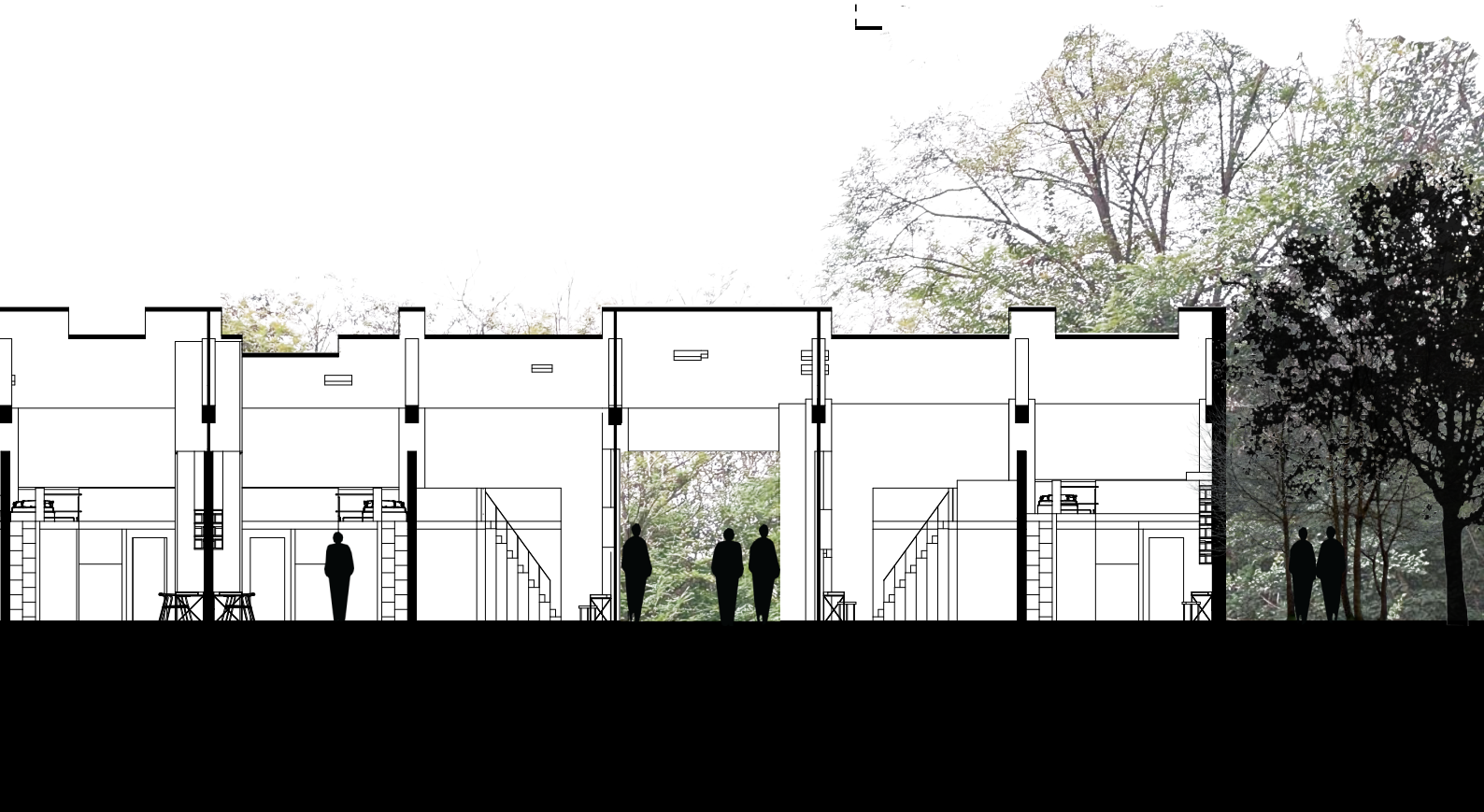
Both of the compounds will be have equal partitions, each will contain 8 houses, the smaller compound will therefore have smaller houses that will in consequence cost less to rent, which could be convenient. The small studio apartments of the students will consist of main functions such as bedrooms, bathrooms, a kitchen, a dining room and a collective work area for after hour works. The same layout will be applied to another compound that has a similar original plan but a different design accordingly to the damages that have taken place.

The guests should be completely aware of the circumstances they will face by choosing an isolated area in the heart of the forest of Mantova, an extremely natural and intact area, as well as some inconvenient problems that might arise due to extreme weather conditions.



Ground floor plan
First floor plan

0 1 2 5 10m

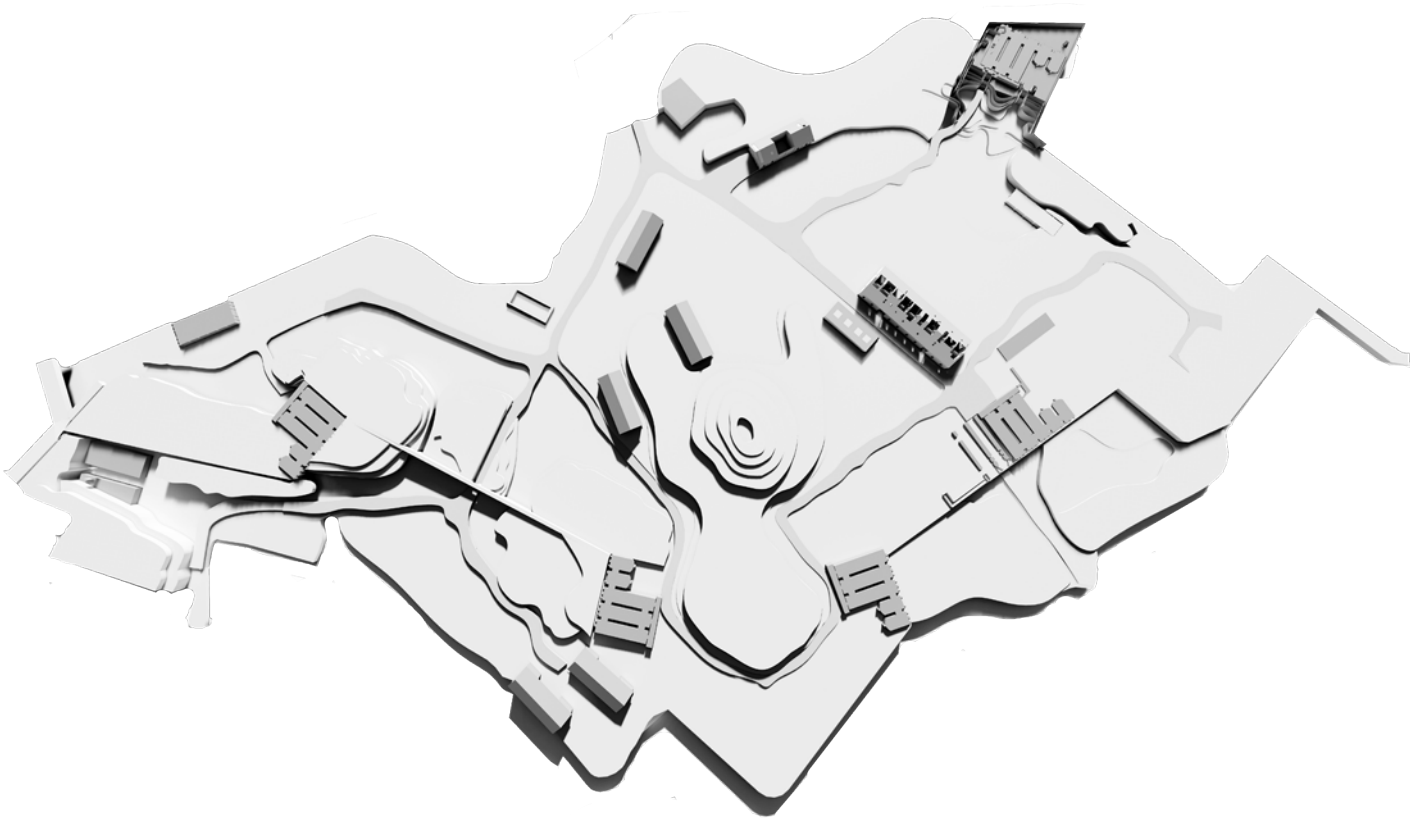


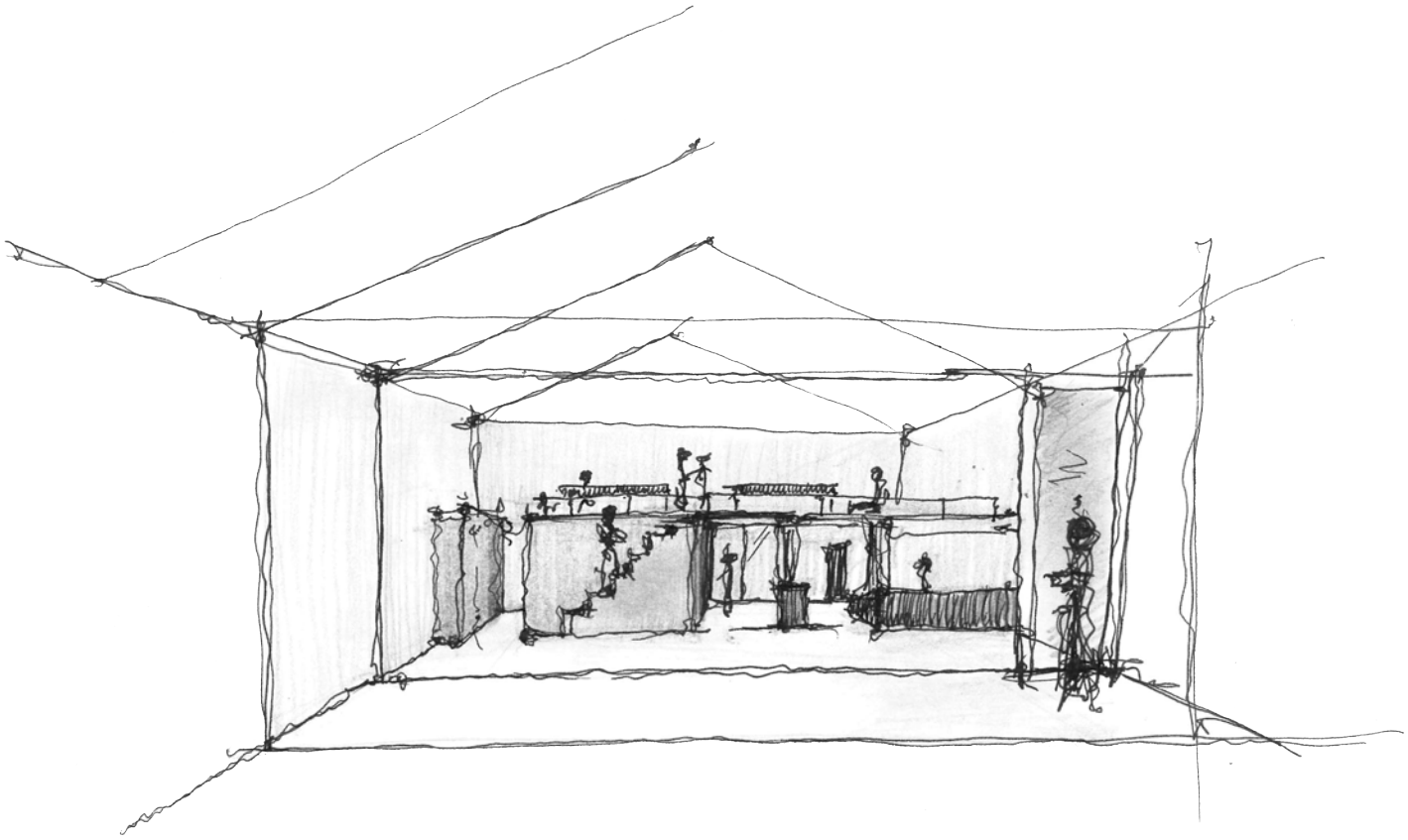
/second house alterations

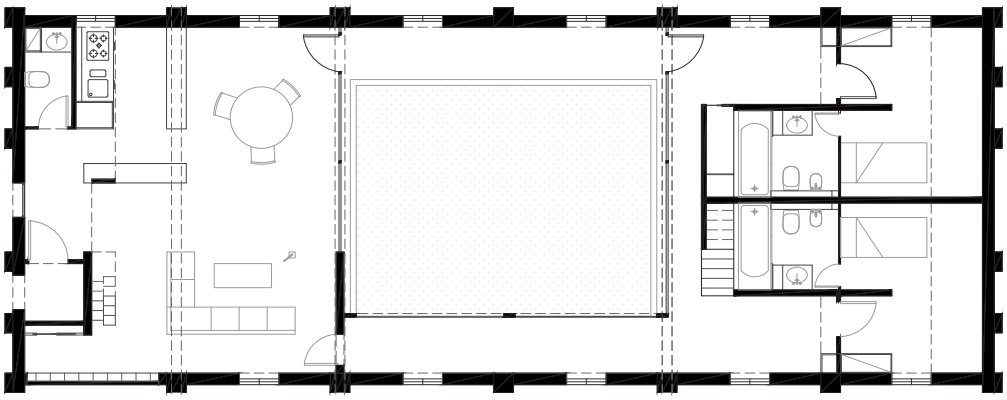
In the first part of the fort, the main elements that were destroyed will become the habitation area of the project. The main access to the Forte is from the center of Mantova to the South-East side of the area. In the first welcoming part of the Forte are 5 main elements that will be transformed into houses and collective habitation for the guests of the workshops or people that decide to spend time in the most mystical part of Mantova, directly at the lake side, in the middle of the forest.

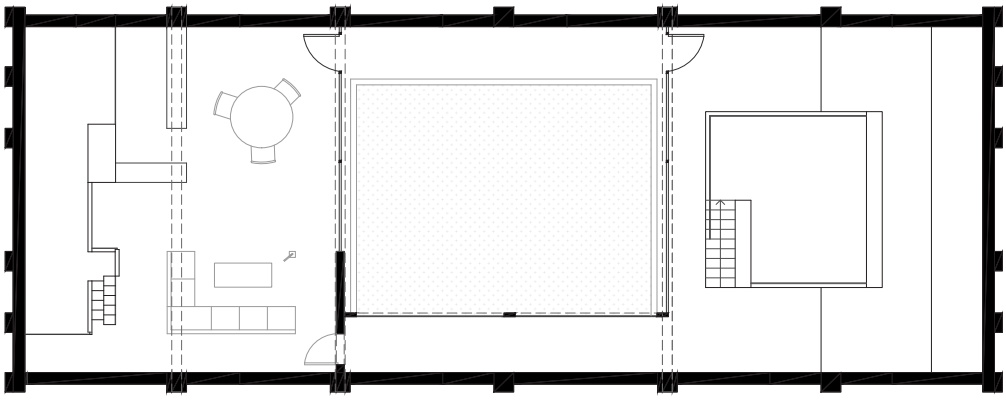
The second building will be transformed into a house for the professors of the workshops. It will consist of one main kitchen at the entrance with a dining room directly on the edge of the indoor patio that is designed relatively to the opening in the middle of the element that already exist because of the fallen roof.

This destruction will create a beautiful interior garden in the heart of the house that links the main zones of the house which are the kitchen, dining room and living room, otherwise referred to as the day zone, and the night zone that consists of the bedrooms and bathrooms.

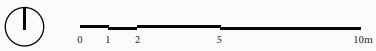


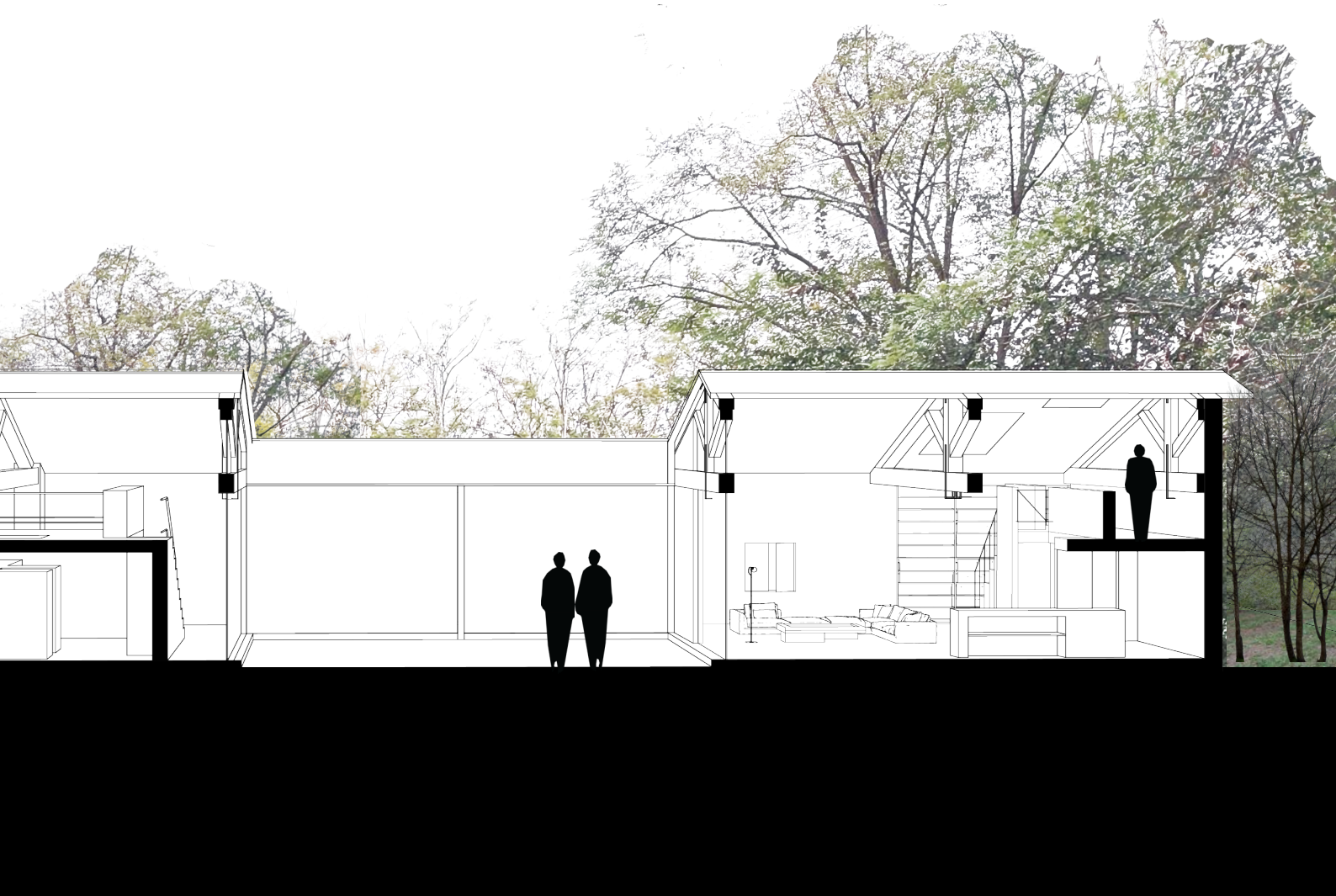






Ground floor plan
First floor plan



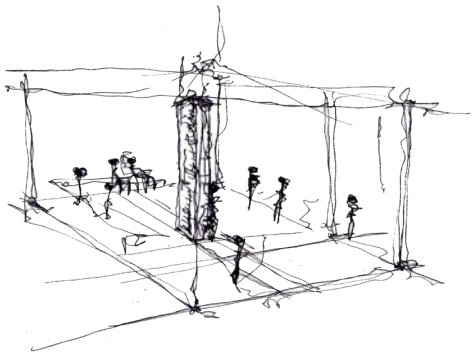


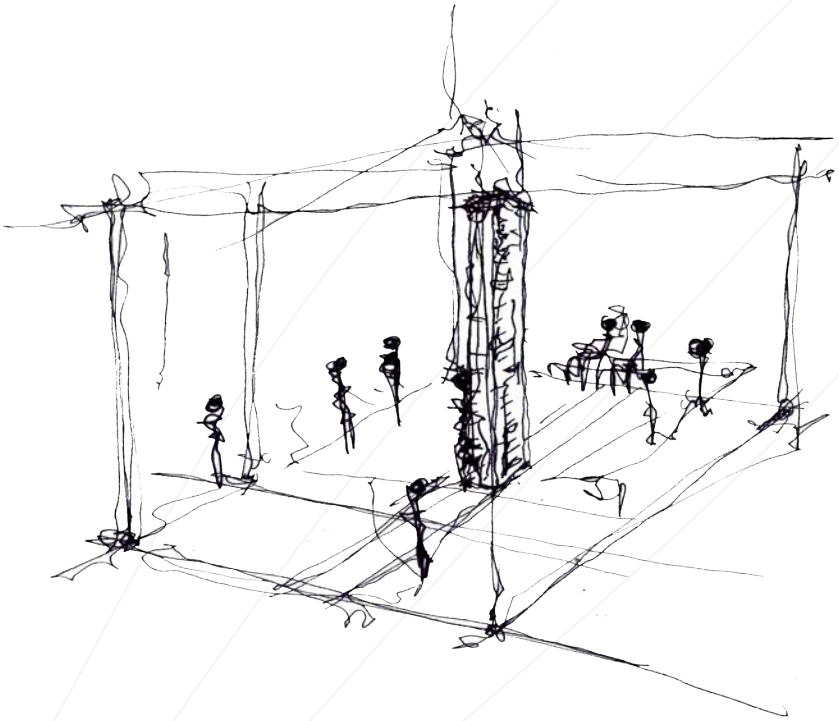
Second degree interventions

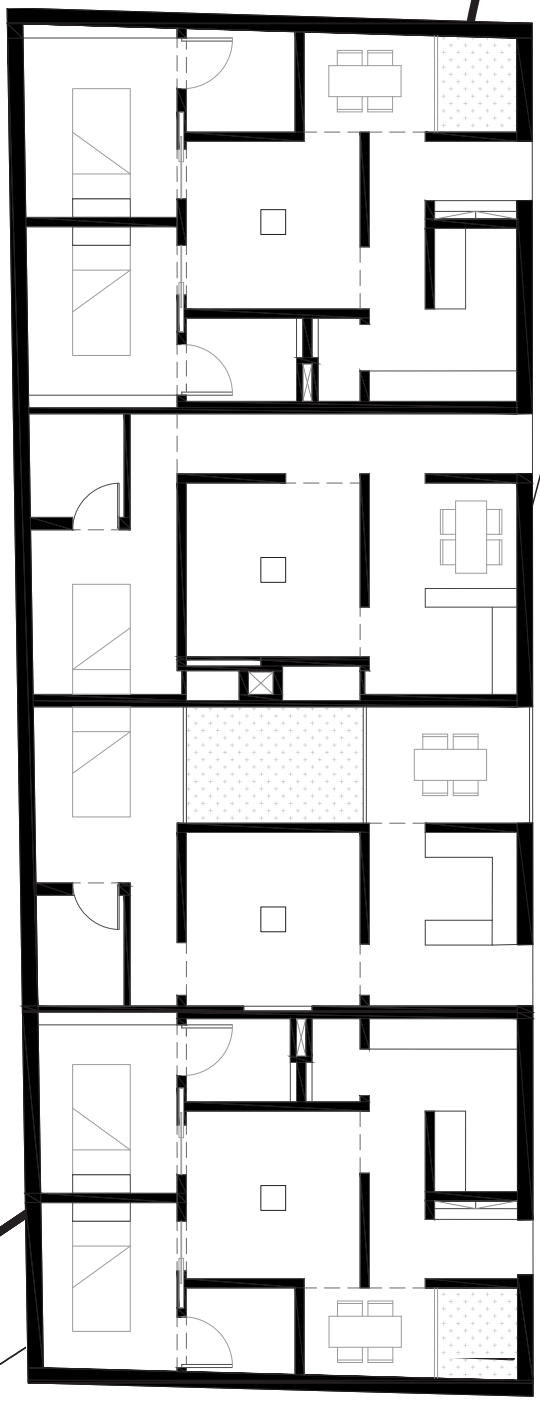
/first house alterations

The first house on the left is slightly smaller than the other 2 compounds deeper into the forte on the same line of the entrance.

Ground floor plan







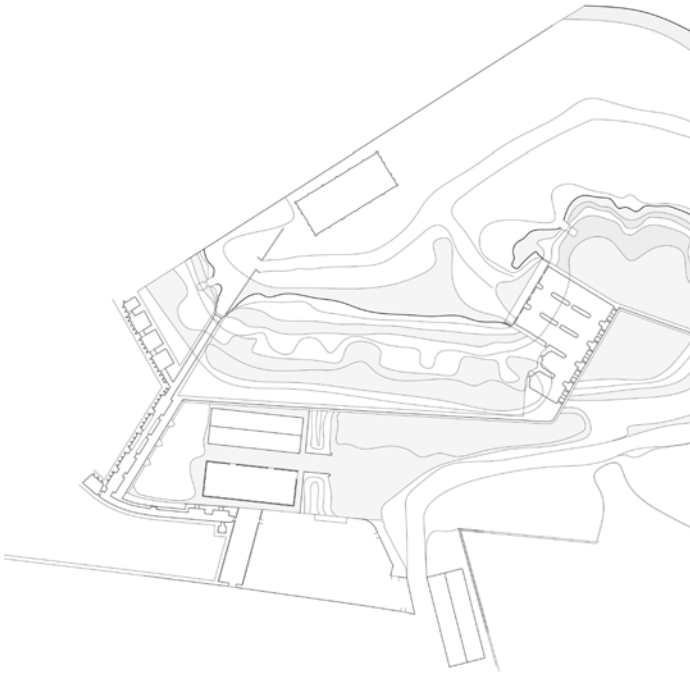
Whichever function the fort takes on will contribute to the enhancement of the life within the fort. Any type of intervention is considered beneficial for the area with the consideration that every newly introduced material will lead to different organisms that would possibly thrive with the presence of this substance, fabric, chemical compound, etc. The idea is that the fort, as an organism, as an eco-system, will take and consume everything that would be introduced in terms of an upcoming human intervention. Any element that is not biodegradable will be part of a dis-mountable system, that can easily remove the elements that would harm the environment when degrading at a relatively slower rate.

The main intention of this involvment is to keep intact the current theme of the Forte di Pietole, it's chaotic state is, subjectively, considered a piece of art, a spontaneous demonstration of how nature reacts with the death of an architecture, with the passing of time, and ends up prevailing with even more life.

The interventions to be made vary in terms of degree of interpositions into the area and the abandonned buildings. To Elaborate, the landscape will only be touched for the sole purpose of safety and accessibility, the abadonned architecture will be cleaned from any harmful vegetative elements that grew into the buildings, interfering with the accessibility and safety of certain areas. All materials that are considered harmful, or simply not part of the forte's living organism is prone to be annihilated.

Minor interventions all over the area will render the area simply more accessible, definitely more safe and mainly to create outdoor meeting areas into the forests of the area, in relation with the existing elements that are being assigned new functions.

The significant intervention will involve the complete re-establishment of the old abandonned hangars previously used to store the powder kegs will be transformed into dormitories, this involves mechanical and electrical installations, which contradicts the concept of not impacting the Forte di Pietole with a major involvment, but with consideration to the sustainable and ecological aspects of the future of this area, any intervention whatsoever can be considered favourable for the flourishment of new species of plants, insects and animals, giving persistently life to the beating heart of the fort, these notable interventions are advantageous as well for the function that they will serve, which is providing shelter for the guests that will be able to experience, what is not considered objectively beautiful, but definitely an interesting display of the relationship between an abadonned military architecture and the natural environment that surrounds it.



[End]

Polyvalent arena

/from fortress to something else

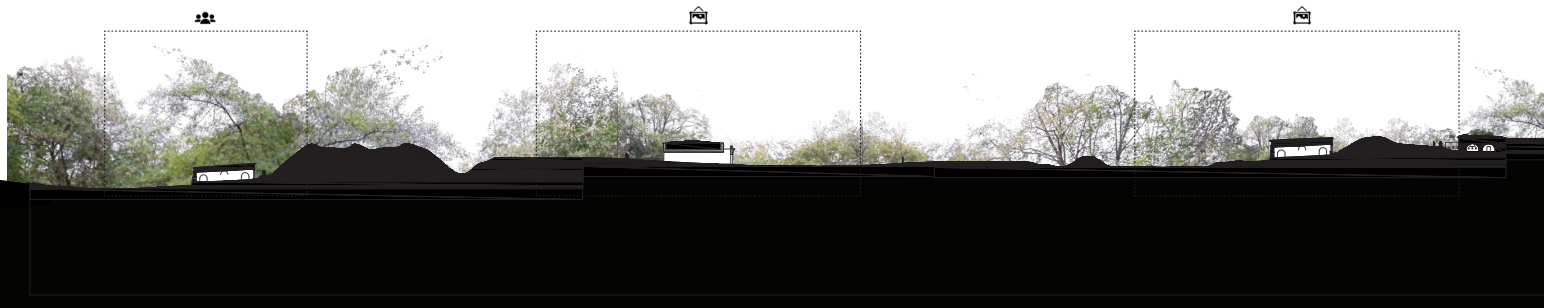
[to be continued]

0 10 20 50 100m

Modelling Laboratory

Exhibition & Presentation spaces

Meeting areas and Community hubs



[End]

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