

## Aristotle's theory as a tool for inspiration in architecture. The shelter of the archaeological site at Akrotiri

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In idyllic ATHENS of the 5<sup>th</sup> century B.C. while gazing out at the Aegean Sea, ARISTOTLE codified the theory of the presocratic philosophers on the value of the 4 basic elements FIRE(SUN), AIR, WATER, EARTH and the 4 basic qualities WARM-COLD, DRY-WET.

I shall try then, very quickly to run with you some PRINCIPLE IDEAS (Spots more or less) on how I have been educated and thus inspired by the ARISTOTLE'S theory to create a sustainable (VIABLE) Architectural design leading to re-establish a friendly microclimate in our full of smoke and POLLUTED ENVIRONMENT through the SUN, the AIR, the WATER and the EARTH.

The notion of experiencing, of living if you like, the built environment through the natural and the artificial events that form it, led in the past to the formulation of the prevailing principles of ARCHITECTURE at various times.

One of these Architectural principles was and is the ATRIUM through which - from the ancient times - was brought the SUN and the AIR in the heart of the buildings.

### 1. ARCHAEOLOGICAL MUSEUM OF THESSALONIKI

The A.M.T.H is a very characteristic example of the modern Architecture of 1950. I was asked to enlarge it (around double) for exhibiting the Macedonian gold and treasures that were found in 1970.

The dominating designing tool here is the SUN which penetrates the building through the new pyramidal opening in the heart of the old museum (the atrium) and thus enters to the enlarged section, which is underground, so does

not affect to the character of the building.

The inclined roof allows only the north rays of the sun to come in and closes by louvers the south rays.

The windows open in the top of the pyramid and thus they create an air duct permitting the wind to flow all over the building.

Simultaneously, creates a transversal view between interior and exterior spaces, bringing the environment into the building.

### 2. OLYMPIC METRO STATION 'IRINI'

The OLYMPIC METRO STATION 'IRINI' was also a pre-existing station. The needed enlargement (because of the Olympic Games) was huge and should be also underground to unify the lower level, which is the level of the Olympic Stadium. The dominated elements I used for the design are the AIR, the WIND.

The WIND penetrates all the levels and refreshes the shadow provided through the roof leaves.

The sun enters filtered by the leaves, and special glasses under them prevent from the infrared and the ultraviolet radiation and create a very friendly microclimate with a sense of shadow under trees for the waiting passengers during the hot summer days. The louvers of the site fences, conduct the fresh north wind in the low level creating a complete air circulation.

The colours reinforce the feeling of movement, as well as the leaves, which are interwoven with the surrounding green.

### 3. OLYMPIC CANOE SLALOM

And now we pass to the element WATER,

which dominates the design of the OLYMPIC CANOE - KAYAK SLALOM VENUE.

The architectural concept of the kayak installations creates the sense of the natural river running along the slopes of the hills of the surrounding environment.

The 8000 spectators are seated either in the grass or in the wooden steps.

Along the course of the river are wooden bridges, reflected in the water, streams, a lake, gentle and steep passages, as well as shaded open spaces for the spectators.

These special moving louvers create a feel of thermal comfort in the outdoor areas especially under the summer sun.

All necessary buildings are hidden behind the hills, and special openings permit the cross air ventilation, as well as views to the Saronic Gulf of Athens.

#### 4. ARCHAEOLOGICAL SITE OF AKROTIRI – SANTORINI

EARTH is the dominating element for the design of the new shelter of the prehistoric city.

It is to one of the eruptions of the volcano of Santorini at the beginning of the Late Bronze Age around 1650 BC that caused the submergence of a large part of the island and the burial of what remained under a thick mantle of pumice and volcanic ash.

A large city was buried. This is a photo of the site before the start of the excavations in 1967 by Prof. Marinatos that still continue up to this day by Prof. Christos Doumas.

These photos confirm the excellent state of preservation of the ruins of the prehistoric city with four-store buildings and squares, and the very advanced level of civilization with even restrooms in the second floor and the excellent drainage system of the city.

The buildings were decorated by unique works of art as the famous wall paintings that adorned the rooms of the buildings.

You see also photos of the abundant finds, as an extravagantly carved table (Victorian style), beds and even foodstuffs (snails) stored in jars (called pithoi).

These photos show the existing volcanic environment after three and a half millenics of erosion.

This volcanic -earth - material that at once

destroyed but also protected for 3.500 years the ancient settlement, was the central tool for defining the philosophy of my design for the new sheltering, arrangement, protection and enhancement of this unique city.

This design is based on all the four natural elements and provides the four qualities for the visitors – the cold during summer, the hot during winter, as well as the dry and wet depending on the time of the day.

The earth covers entirely above the new shelter, which is arranged in arched sections and in a North-South direction.

The sun enters only through the special slits of the north openings and provides the lost feeling of down and sunset in the buried city.

The wind refreshes the air during night cross natural ventilation, when the outside temperature drops down many degrees in comparison with the very hot midday. During day the openings close and thus the low night temperature is kept, creating thermal comfort conditions for the thousands of visitors and the archaeologists who still digging there.

The shelter is designed in such a way that it does not violate the overall harmony of the area, and is arranged as an extension of the configuration of the surrounding land curves.

These are air photos of the site some months ago with the in oxide shelter before covered by earth.

The shelter is consisted of a space frame covered by INOX metal sheets and on these are the waterproof membranes and the earth cover. The ceiling of the arched sections of the roof is formed by wood planks. The buffer zone in between, helps the abduction of the heat during day due to the visitor's exhalations of carbon dioxide.

These are photos from the pilot application by which are controlled all systems and elements applied in the nearby real site.

The space frame is supported by pillars situated in the same shafts where the previous temporary DEXION columns were based. There are opened shafts of 18 meters depth in the bedrock. A unique gold ibex was found during the pillars excavations. A full tomography of the ancient ground was done to identify the right places for the columns foundations and thus the relief of the ancient city is now documented.

A sustainable project has to find sustainable

methodology to be constructed, thus there are opened holes in the preexisting temporary shelter. You can see the very careful transfer and the placement of the reinforcement, the placement of the seismic insulators and after the accurate positioning of the metal columns supporting the space frame of the new shelter.

You can see also photos of the scaffolding and the intermediate protection level for the safety of the antiquities during the construction of the new shelter.

These are photos from the formulation of the surroundings geowalls and the start of the positioning of the space frame.

Through this short film and photos you see how the inox metal sheets are covered with the waterproof membrane and are ready to be filled with the volcanic earth.

Aristotle in his theory of the cosmos (the world) states that it is possessed by the influence of a NATURE that organized everything in the most proper manner. Precisely, this COSMOS with its mountains, its waters, its plants, the animals and of course HUMANS became the most worthy subject of his theory, by which the ENVIRONMENT dominates ARCHITECTURE.