RE-THINK ATHENS: TOWARDS A NEW CITY CENTRE

DIN: CA71195197

ABSTRACT AND REPORT

2nd STAGE OF THE COMPETITION

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1. ABSTRACT ENGLISH

Not many times we have the chance to design an intervention big enough to make an impact in the heart of such a historical city. Greece is the brain of humanity and Athens is the core of that brain. It's difficult to describe how exciting and stimulating is for an architect to participate in such a project.

For this second stage we have made up a very strong multidisciplinary team with archaeologist, engineers, bioclimatic consultants and cost control experts to deliver a solid development of the initial proposal.

We have tried to condense all the spirit of Athens to bring back to life an area that in the old times was a cemetery and in the last few years has lost its soul. An Athenian tale says that when the Persians burned up Athens in the 5th Century B.C. an olive tree emerged the very next day, just like a miracle… The olive, one of the main symbols of Athens, and also the symbol of renovation and regeneration for the Greeks, is one of the main inspirations of our project that will give to the entire area a very powerful and recognizable image and city branding even from a large scale perspective.

Our main idea is to join the two parks at the end of the intervention (Pedion Areos and Lotos Likavitou) with a green mass that will flow all along the intervention, bringing back the greenery to an area that used to be a green zone in the outside of the old Athens walls and creating a green corridor that joins the old Athens with the new Athens

That green corridor is formed by: (1) the existing trees preserved; (2) the new trees added; (3) a continuous floor all along the project with a pattern that is an abstraction from olive tree branches; (4) The artificial activity/bioclimatic trees we create.

We analyzed very well the case in all aspects: traffic, activities, buildings, borders, accessibility, etc… From that analysis we found a way to reorder traffics and locate the different activities that we found necessary to introduce following different themes of classic Greek culture linked to specific spaces of the intervention: Concorde and Arts around Omonias, Democracy around the Parliament, Body shaping around the Archeology Museum and Philosophy around the University.

With these themes and our design strategy the result is an urban park-like intervention that creates a global green aspect and fills with life and activities the heart of Athens.

2. ΠΕΡΙΛΗΨΗ ΣΤΑ ΕΛΛΗΝΙΚΑ

Σπάνιες είναι οι περιπτώσεις στις οποίες παρέχεται η ευκαρία σε έναν αρχιτέκτονα να υλοποιήσει μία ευρείας κλίμακας παρέμβαση (και μάλιστα με τόσο σημαντικό αντίκτυπο) στην καρδιά μιας πόλης τόσο ιστορικής όσο η Αθήνα. Πράγματι, αν η Ελλάδα θεωρείται δικαίως ο νους της ανθρωπότητας, η Αθήνα αποτελεί τον πυρήνα αυτού του νου. Υπό αυτό το πρίσμα, δεν είναι διόλου εύκολο να περιγραφεί με λόγια πόσο συναρπαστική και γοητευτική φαντάζει για έναν αρχιτέκτονα η συμμετοχή σε αυτό το έργο.

Εν όψει της δεύτερης φάσης του διαγωνισμού και προκειμένου να αναπτύξουμε πλήρως την αρχική μας πρόταση, συγκροτήσαμε μια δυναμική διεπιστημονική ομάδα που αποτελείται , μεταξύ άλλων, από αρχαιολόγους, πολιτικούς μηχανικούς , συμβούλους βιοκλιματικού σχεδιασμού και ειδικούς διαχείρισης και ελέγχου δαπανών.

Η ομάδα επιχείρησε να συνοψήσει το πνεύμα της Αθήνας με σκοπό να δώσει νέα πνοή ζωής σε μια περιοχή, η οποία κατά την Κλασσική Περίοδο χρησίμευσε ως νεκρόπολη, ενώ κατά τους τελευταίους χρόνους είχε απωλέσει την ψυχή» της.

Σύμφωνα με έναν αρχαίο μύθο, η ιερή ελιά στην Ακρόπολη κάηκε ολοσχερώς όταν οι Πέρσες πυρπόλησαν την πόλη των Αθηναιών. Όμως την επόμενη κιόλας μέρα από το καμένο κορμό του δέντρου ξεφύτρωσε ως εκ θαύματος ένας ολοκαίνουργιος βλαστός. Η ελιά, ένα από τα αντιπροσωπευτικότερα σύμβολα της Αθήνας αλλά και το έμβλημα της αναγέννησης για τους Έλληνες, συνιστά μία από τις σημαντικότερες πηγές έμπνευσης του προτεινόμενου έργο. Η πρότασή μας στόχο έχει να προσδώσει μια ισχυρή και αναγνωρίσιμη εικόνα σε όλη την περιοχή καθώς και να αποτέσει σήμα κατατεθέν της πόλης, ακόμη και σε ευρύτερη κλίμακα.

Η κεντρική μας ιδέα είναι να συνδέσουμε τα δύο πάρκα που βρίσκονται στις άκρες της ζώνης παρέμβασης (το Πεδίον του Άρεως και το Lotos Λυκαβηττού) μέσω μιας πράσινης λωρίδας. Στόχος μας είναι να επαναφέρουμε τη βλάστιση σε μια περιοχή η οποία κατά την Αρχαιότητα βρισκόταν εκτός των τειχών και ήταν πυκνόφυτη. Υπ'αυτήν την έννοια, η λωρίδα πρασσίνου που έχουμε σχεδιάσει συνιστά ταυτόχρονα ένα «διάδρομο χρόνου» που φέρνει σε επαφή την Παλαιά με τη Νέα Αθήνα.

Η πράσινη λωρίδα αποτελείται από: (1) το ήση υπάρχοντα δέντρα, καθώς σκοπός μας είναι να παραμείνουν αννέγγιχτα (2) τα νέα δέντρα που πρόκειται να φυτέψουμε (3) έναν συνεχη πεζόδρομο που θα εκτείνεται σε όλο το μήκος του έργου και θα έχει ως χαρακτηριστικό σχεδιαστικό μοτίβο την αφαιρετική απεικόνιση ενός κλάδου ελιάς (4) Τα «activity/bioclimatic trees» που θα δημιουργήσουμε.

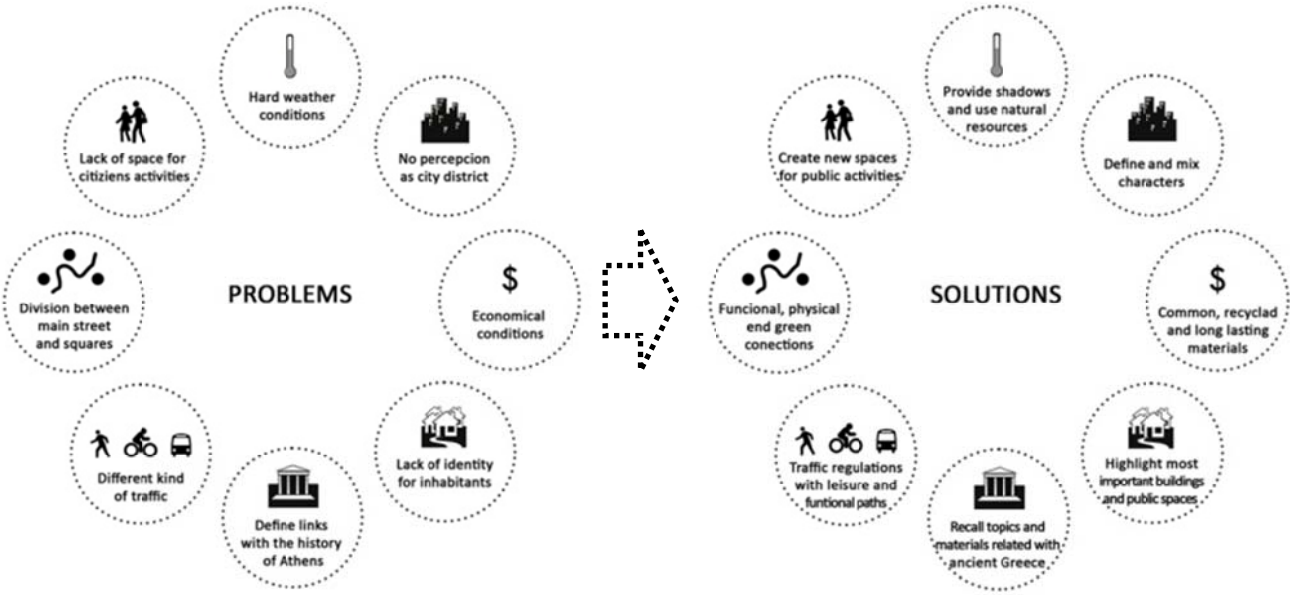
Το προτείνομενο έργο αναλύθηκε εις βάθος και σε όλες τις πτυχές του: κυκλοφορία, δραστηριότητες, κτήρια, όρια, προσβασιμότητα, κ.τ.λ. Με βάση αυτή την ανάλυση, βρήκαμε τον τρόπο να αναδιαριθμίσουμε την κυκλοφορία και να εντάσσουμε δραστηριότητες που κρίναμε αναγκαίο να εισαχθούν. Συνδέσαμε έννοιες του κλασικού ελληνικού πολιτισμού με συγκεκριμένους χώρους της παρέμβασης: την έννοια της Δημοκρατίας με την Πλατεία Συγτάγματος· τη Φιλοσοφία με την περιοχή του Πανεπιστημίου· την αρμονική συμβίωση και τεχνες με την Πλατεία Ομονοίας· αλλά την έννοια της μορφής του σώματος με την περιοχή του Αρχαιολογικού Μουσείου.

Με την βοήθεια αυτών των εννοιών και τη στρατηγική του σχεδιασμού μας, το αποτέλεσμα θα είναι ένα αστικό πάρκο, το οποίο θα προσδίδει μια ολοκληρομένη πράσινη εμφάνιση στην πόλη και θα κάνει την καρδιά της Αθήνας να ξεχειλίσει από ζωή και δραστηριότητες.s

3. ANALYSIS OF THE CASE

3.1 GENERAL URBAN ANALYSIS

Based on the results of a deep analysis of the area we have obtained a series of outputs that have guided the formal and functional proposals that we are developing: flows analysis, sun-incidence studies, building uses, full-empty contrasts, demand-offer of activities, existing vegetation mass, existing and foreseen public transportation, transportation and communication nodes, natural-artificial light, etc…



Sustainable integration is the key concept at this point. We propose an actuation that integrates the analysis's outputs with the new actuation proposals. We try to respect the area as much as possible and at the same time we try to economize in the final solution.

By respecting the existing vegetation everything will be more attractive from the beginning as we'll not have to wait for years until the brand new trees grow up to have a considerable vegetation mass.

The same way, if we are defending that our Project connects green areas and parks, we can't take for granted the importance of the existing trees in the area, that can be just completed where needed by planting brand new natural trees or artificial "activity trees" (the big attraction of our proposal).

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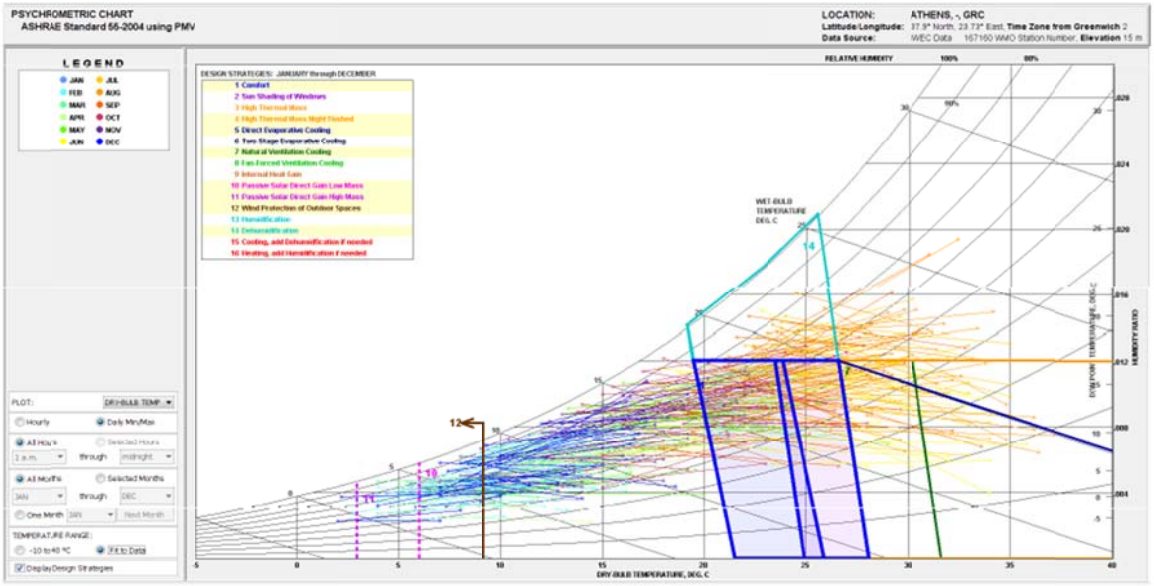
3.2 CLIMATIC CONDITIONS ANALYSIS

A deep analysis of the local climatic conditions has been undertaken. First, the general conditions of Athens have been studied taking into consideration all these factors: (i) Sun Radiation (horizontal, normal, diffuse); (ii) Illumination; (iii) Temperature; (iv) Dew Point; (v) Relative humidity; (vi) Winds directions, (vii) Wind speed, (viii) Ground temperature.

From those data a psychometric chart was casted and with the help of software modeling all the comfort parameters were obtained ..



ASHRAE Standard 55-2004 using PMV (Predicted Mean Vote) Model (select Help for definitions)

1. COMFORT: (using ASHRAE 55 PMV Model)

1.0	Winter Clothing Indoors (1.0 Clo=long pants,sweater)
0.5	Summer Clothing Indoors (.5 Clo=shorts,light top)
1.1	Activity Level Daytime (1.1 Met=sitting,reading)
90.0	Predicted Percent of People Satisfied (100 - PPD)
20.3	Comfort Lowest Winter Temp calculated by PMV model(ET* C)
24.3	Comfort Highest Winter Temp calculated by PMV model(ET* C)
26.7	Comfort Highest Summer Temp calculated by PMV model(ET* C)
84.6	Maximum Humidity calculated by PMV model (%)

2. SUN SHADING ZONE: (Defaults to Comfort Low)

20.3	Min. Dry Bulb Temperature when Need for Shading Begins (°C)
315.5	Min. Global Horiz. Radiation when Need for Shading Begins (Wh/sq.m)

3. HIGH THERMAL MASS ZONE:

8.3	Max. Dry Bulb Temperature Difference above Comfort High (°C)
2.8	Min. Nighttime Temperature Difference below Comfort High (°C)

4. HIGH THERMAL MASS WITH NIGHT FLUSHING ZONE:

16.7	Max. Dry Bulb Temperature Difference above Comfort High (°C)
2.8	Min. Nighttime Temperature Difference below Comfort High (°C)

5. DIRECT EVAPORATIVE COOLING ZONE: (Defined by Comfort Zone)

20.0	Max. Wet Bulb set by Max. Comfort Zone Wet Bulb (°C)
6.6	Min. Wet Bulb set by Min. Comfort Zone Wet Bulb (°C)

6. TWO-STAGE EVAPORATIVE COOLING ZONE:

50.0	% Efficiency of Indirect Stage

7. NATURAL VENTILATION COOLING ZONE:

2.0	Terrain Category to modify Wind Speed (2=suburban)
0.2	Min. Indoor Velocity to Effect Indoor Comfort (m/s)
1.5	Max. Comfortable Velocity (per ASHRAE Std. 55) (m/s)

8. FAN-FORCED VENTILATION COOLING ZONE:

0.8	Max. Mechanical Ventilation Velocity (m/s)
3.0	Max. Perceived Temperature Reduction (°C)
	(Min Vel, Max RH, Max WB match Natural Ventilation)

9. INTERNAL HEAT GAIN ZONE:

12.8	Balance Point Temperature Above Which Building Runs Free (°C)

10. PASSIVE SOLAR DIRECT GAIN LOW MASS ZONE:

157.7	Min. South Window Radiation for 5.56°C Temperature Rise (Wh/sq.m
3.0	Thermal Time Lag for Low Mass Buildings (hours)

11. PASSIVE SOLAR DIRECT GAIN HIGH MASS ZONE:

157.7	Min. South Window Radiation for 5.56°C Temperature Rise (Wh/sq.m
12.0	Thermal Time Lag for High Mass Buildings (hours)

12. WIND PROTECTION ZONE:

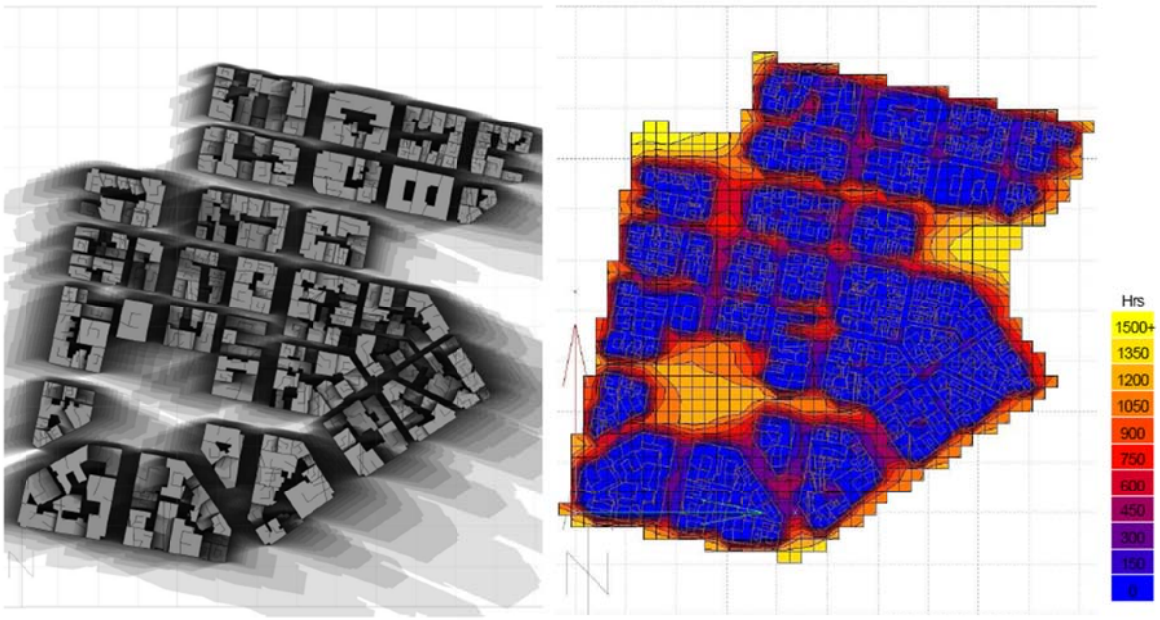
8.5	Min.Velocity above which Wind Protection is Desirable (m/s)
11.1	Min. Dry Bulb Temperature Difference Below Comfort Low (°C)

13. HUMIDIFICATION ZONE: (directly below Comfort Zone)

14. DEHUMIDIFICATION ZONE: (directly above Comfort Zone)

After that a micro-climate study was undertaken to specify the conditions for the intervention area. The whole area was modeled in a tridimensional model to run a simulation program and obtain with a high grade of detail the climatic conditions for the urban spaces of the intervention. From that simulation, visual models were obtain, these models were really crucial to decide the lay out and location of our elements, specially the activity trees.

SUMMER CONDITIONS: OMONIAS Shading analysis (July from 7:00h to 19:00h) and summer sun hours (from June to September):



Summer and winter sun and shading conditions have been analyzed in order to define the localization of shading and passive cooling devices as follows:

- Winter conditions:
    - Solar radiation is required for feeling comfortable in an open space if a person is seated with a clothing of 1.5clo.
    - The shading study analyzes the shades from 8:00h to 17:00h in the coldest month (February).
- Summer conditions:
    - From June to September. Shading is required in open space for this period for a seated person with a clothing of 0.5clo.
    - The shades of August (the month that requires more shading hours) from 7:00h to 19:00h have been defined. Shading is required to be in comfort in

public space. Other passive strategies will be implemented in designed shading devices as natural ventilation increment and direct evaporative cooling.

The conclusions of the study define two different public spaces:

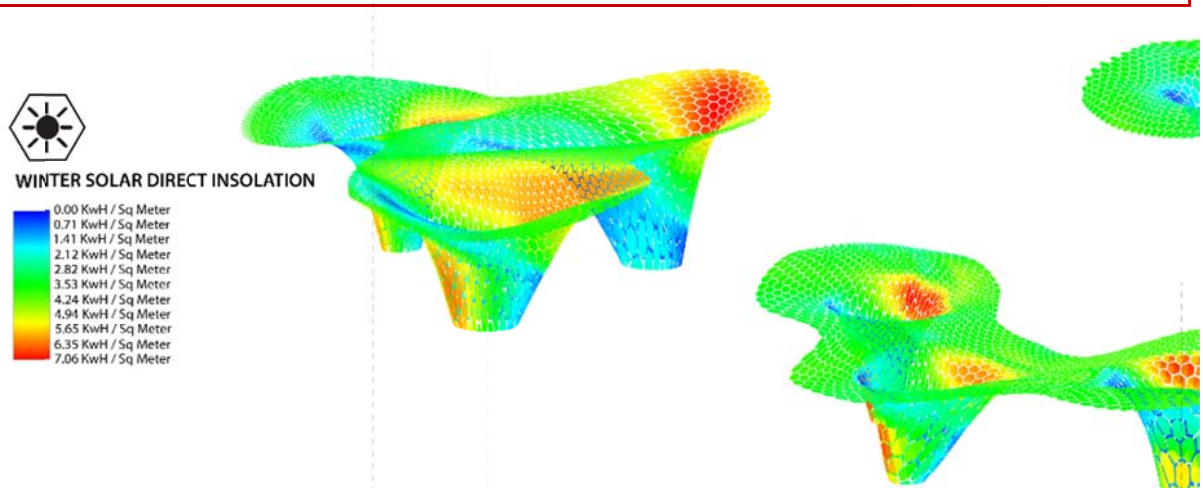
- Those spaces that require direct sun radiation: In order to have comfortable public spaces for winter period some sunny places have to be maintained.

- Spaces that required shading: Areas were shading devices will be installed. Shading is necessary in these areas to be comfortable during summer period.

Our main element, the activity/bioclimatic trees, have been located with the help of these analysis.

Finally, after making a simulation with all these conditions before and after installing the activity trees and the new floor, we have reached these values of how our scheme improves the current climatic conditions according to the software model:

- Average reduction of the maximum summer temperature at 1,8 m high in the areas around the activity/bioclimatic trees: 5ºC
- Reduction of the air condition usage during typical summer day over a 26ºC for the activities and mini buildings beneath the activity/bioclimatic trees: 60%
- Average improvements of thermal comfort index during a typical summer day in the areas around the activity/bioclimatic trees: 40%
- Reduction of the maximum surface temperature under the activity trees: 40%
- Reduction of the maximum surface temperature outside the activity trees: 10%



3.3 ARCHAEOLOGY AND HISTORICAL COMMENTARY

The Competition's intervention area has an exciting and long history which can be traced from the Submycenaean times onwards. Yet, it should be said that the bulk of the available related information mainly concerns post-archaic periods.

Thus, the archaeological record shows that during the fifth and fourth century BC the area of intervention lay outside the Themistokleian fortification wall. Despite the fact that the area was not densely populated, it was much transited. The area was crossed by the roads that departed from the Acharnian Gate, the so-called Northeast Gate and the Diochares Gate towards the *deme* of Acharnai, the Lykabettos and the Mesogaia respectively. The inhabitants of Athens buried their dead in the vicinity of these roads. The area was also devoted to workshops.

Besides, the zones of Amalias Avenue, Syntagma Square and Panepistimiou Street were transited on a daily basis by citizens and ephebes in their way to the Lykeion Gymnasium - the remains of this gymnasium have been recently found on Rigilis Street -. At the Lykeion Gymnasium the Athenian men did their athletic practice, received their military training and pursued their studies. Aristotle, the founder of the Peripatetic School, taught at the Lykeion. The Greek word 'peripatetics' refers to those who used to walk while talking, teaching or learning. A 'peripatos' was a place for walking, and more specifically a covered walk.

During the Hadrian's era (2nd century AD), when the city of Athens experienced a new cultural flowering, the wall circuit was enlarged to enclose the zone of Syntagma Square and the National Garden. A portion of this wall as well as a tower were found at 2 Panepistimiou. Later, in the middle of the 3rd century AD, a new wall was built by Valerian the Elder on the foundations of the Themistoklean Wall and the Hadrian Wall.

During the Byzantine and the post-Byzantine periods the area of Panepistimiou Street was occupied by farmland and pastures, as we can see in a plan of Athens under the Turkish occupation designed by Coubault ca. 1800.

After the war of liberation Athens became the capital of Greece. Several architects were commissioned to design a modern city plan fit for the capital of a state. The plans for the city of Athens designed by Leopold von Klenze in 1834 and by Friedrich von Gaertner in 1837 provided for boulevards with trees along Amalias Avenue and Panepistimiou Street. These boulevards are called 'peripatoi' in the Greek version of the plans.

Thanks to the maps of Athens drawn by C. von Stranz (1862) and J.A. Kaupert (1875) we know than during the second half of the 19th century the city quickly expanded towards northeast well beyond Panepistimiou Street. By this time, the Omonoia area was already built up. From 1834 to the end of the 19th century important buildings were built in the competition's intervention area: the Royal Palace/Parlament, the Schliemann Building, the Trilogy, the Arsakio Girls' School, the National Archaeological Museum, etc.

Literary works (see e.g. the description of Omonoia Square made by Michail Mitsakis in 1893), old photographs and other types of visual resources allow us to know how the area of intervention was during the last quarter of the 19th century and the beginning of the 20th century: building and kiosks took it in turns with trees and gardens. In the last decades the Athenian urban landscape has changed and comprised a wide range of land use activities. But even today it is obvious that the inhabitants of this city demand green spaces.

In fact this overview enables us to highlight two constant features concerning the area of intervention. The first feature is that Amalias Avenue, Panepistimiou Street and 28 Oktovriou Street have been always much transited alleyways. The second feature is that, from ancestral times onwards, greenery has had a permanent presence along these corridors.

4. MAIN IDEAS AND STRATEGIES OF OUR PROPOSAL

4.1 MAIN IDEAS

In such ambitious project as this, the proposal cannot be limited to just re-order and re-organize the traffic to give the space back to pedestrians. A project like this requires to address many other aspects: the environment, the activities that take place in that area and the ones that are missing, the heritage, the real estate, the functionality of the zone, the cost... It's a unique opportunity to stop and think how we can have a better city.

The city belongs to the citizens, not to the institutions or to the architects that design it. We want this to be a project created by the people, we are launching a starting idea that will have to be enriched by the inputs of all the stakeholders, specially the citizens of Athens, that's why we have also designed a participation strategy that will take place during the different project phases and will collect the citizens and stakeholders needs, preferences and demands. Greece is the cradle of Democracy and this is a project with a deep democrat aspiration.

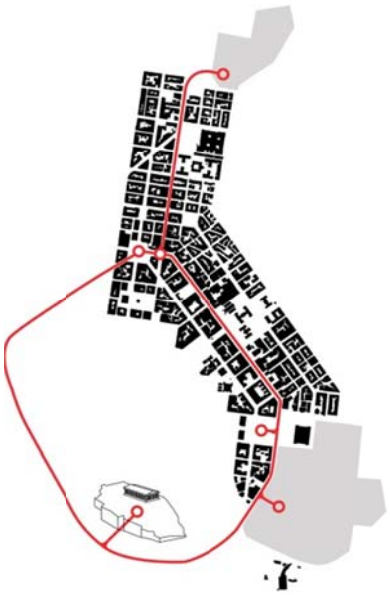
Our start-point idea is to create a green corridor connecting the two green poles (Pedion Areos Park and the National Garden of Athens), located at the two extremes of the actuation.

In order to create this corridor, the first thing to do is to liberate the actuation area from traffic and give back to the pedestrian the spaces that right now are using the cars.

All the traffic in this area will be divert to the adjacent streets. Actually this was one of the competition rules to follow.

In our proposal, we show in detail how these streets are going to work with the traffic, how lanes are going to be assigned, how we are going to integrate the crossroads of traffic and pedestrians and finally how are we going to integrate all the public transportation network.

Our project, although having a very powerful image, is driven by three very simple elements, all of them based on one of the main symbols of Athens, the olive tree: (1) A unitary floor designed as the abstraction of olive branches; (2) a group of shelters distributed in specific places all along the intervention that we call "activity trees". These elements, apart from been the shelters that host the activities, have been designed as an abstraction of a tree, trying to offer with them all the benefits of trees but



in a much more advanced and controlled environment and with a series of very advanced devices that allow them to collect water, energy, information and later offer it to the environment around them; (3) finally a series of “activity leaves” that very light constructions easy to assemble and dismantle that have a leave-like shape and are used as cafeterias, libraries, kioks, meeting rooms, etc.. supported by the activity trees.

Grouping up different activities around the activity trees and giving them a common shelter, will make it more sustainable and will create synergies and mix enrichments.

At the end all these elements are used as tools to reach our project generation-idea or main goal of creating a green corridor of natural and artificial trees and vegetation. All the actions of our proposal have tended to empower this main idea.

With this Project the small scale is just super nice and fresh and the big scale is just amazing as everything will make even more sense from far away, so the new aerial view of Athens will show now some new branches of the old city olive tree as a symbol of renovation and a very strong city-branding.

4.2 BIOCLIMATIC STRATEGIES

Modifying the current city life behavior, that generates huge energy consumption, would have a big impact on natural resource conservation, and a beneficial effect by reducing emissions of CO2 and other gases and particles into the atmosphere.

Life Cycle Scheme

A life-cycle assessment is a technique to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave.

Eco-design considers environmental aspects at all stages of the product development process, striving for products with the least environmental impact possible. This methodology can identify clear inputs and outputs of the process involving environmental impact at all stages of the project, in order to enable their minimization.

Green Urban Areas

Green zones play an important role in the urban environment. They improve the inhabitants’ quality of life, especially the air quality. The actions proposed by the project for the green areas are:

- Native Species. Which have a lower consumption of natural resources and are better adapted to the environment i.e. *Olea europaea*, *Rosmarinus officinalis, Crocus flavus, etc.*

- Bioclimatic Design. For the ordination of green areas we have taken into account issues such as climate tolerance, performance in urban and required use.
- Enhancing Biodiversity. More than 2.000 new specimens are included in this Project.
- Thematic gardening. Gardens with new collections: aromatic plants, xeriscape or historic gardens.
- Aesthetics adapted. The design of green areas also takes into account the characteristics of color, material and shape of the urban heritage of Athens.
- Green areas management. Sustainable gardening practices, efficient irrigation system and organic wastes as fertilizers.

Vegetable species, activity trees and citizens build up the ecosystem which is going to be created in the city centre. The relationship between these three actors will enhance social, environmental and economic aspects of the city centre.

Carbon Footprint Strategy

A carbon footprint reduction strategy is proposed, based on reducing and offsetting carbon emissions in order to achieve a zero carbon balance:

- *Save electric energy*, through using intelligent management systems, efficient water pumping system and LED lighting reduces power consumption by 70%.

- *Low emission transport*. Promoting the use of bicycle, electric vehicles and public transportation to reduce emissions by 60-80%.

- *Bioclimatic design.* Our urban design takes into account the local weather conditions.

- *Low carbon materials.* Using recycled materials and low carbon footprint materials can reduce by 47% GHG emissions

Proposed actions for offsetting are:

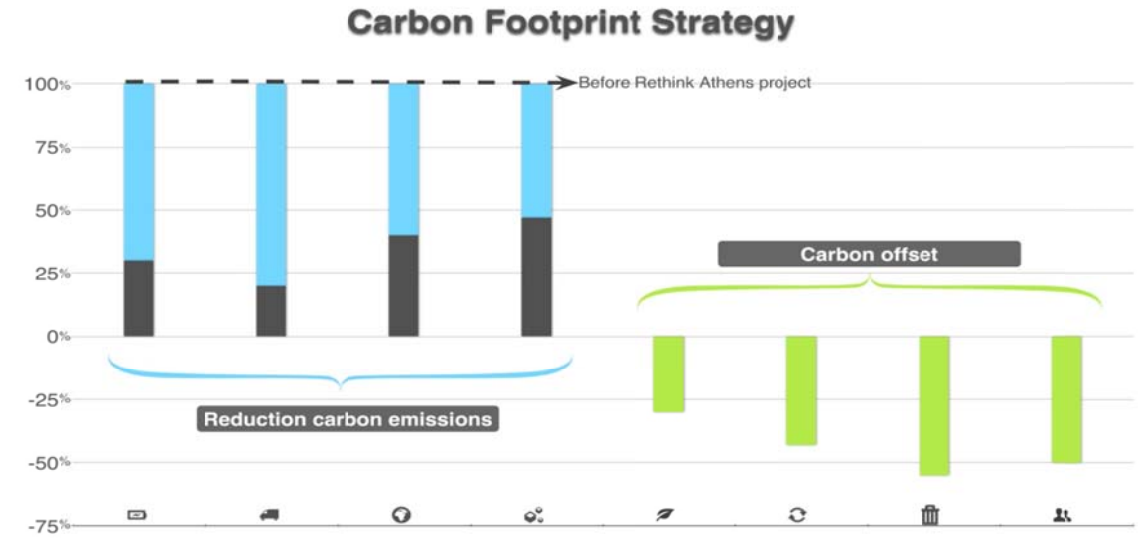
- *Increased green urban areas.* Large expansions of parkland using native species that require fewer resources and capture 30% carbon over baseline.

- *Renewable energy.* Using Photovoltaic Energy in the mini-buildings and Activity Trees providing at least 43% of the energy consumed.

- *Organic waste and harvesting rainwater.* Reusing organic waste for compost of green areas and using rainwater for irrigation will reduce by 55% the resources needed for management, decreasing water consumption and maintenance products.

- *Environmental awareness training.* Interactive information panels about carbon footprint from everyday activities, located in the subway, bus stop, town hall, etc.

These measures will reduce 60% carbon emissions to the atmosphere and other actions to offset by 40% emissions that can't be reduced, trying to get the zero carbon balance.



Save Electric Energy

Using inteligent management systems, efficient water pumping system and LED lighting reduces power consumption by 70%.

Low emission transport

Restricting traffic strategy (Panepistimiou Street, Amalias Avenue, Patission Street) and promoting use of bicycle, electric vehicles and public transport reduce emissions by 60-80%, included influence area.

Bioclimatic design

Omonia, Trilogy and Dikaiosynis squares' design takes into account the local weather, the factors which have been considered are: heat protection including insulation and air tightness, solar energy for heat and light, sun protection with the orientation, using reflective materials and removal heat due to natural ventilation.

Low carbon materials

Using recycled materials and low carbon footprint materials can reduced up to 47% GHG emissions (We propose to use "carbon negative cement" which is a compound of magnesium silicates is more abundant and easy to extract and produce than traditional cement)

Increase green urban areas

Large expanse of parkland and the use of vegetable native species that require less resource capture 30% carbon over baseline.

Renewable energy

Using Photovoltaic Energy in buildings and Activity Tree gives by 43% of the energy consumed.

Organic waste and harvesting rainwater

Reusing organic waste from care of green areas (National Garden Athens and Pedion Areos Park) and using rainwater for irrigation reduce by 55% the resources needed for management, decreasing water consumption and maintenance products (fertilizers,compost,...)

Environmental awareness training

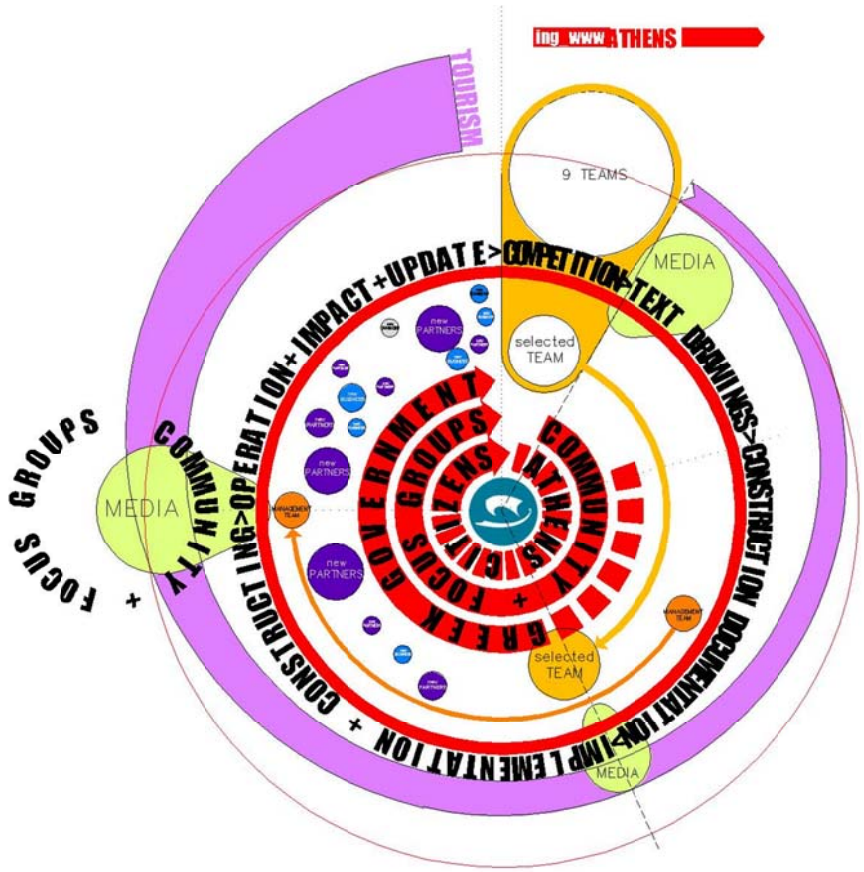
In Athens, the average emission per person a year is 4,7 ton carbon.The 50% of carbon footprint is associated with citizen's standards. We propose to empower people by: developing engagement and awareness strategies: using technology that assist them in decision making (Interactive information panels about carbon footprint from everyday activities, located in the subway, bus stop, town hall, etc.

4.3 SOCIAL AND STAKEHOLDER PARTICIPATION STRATEGIES

Good design is based on consultation and conversation, and this would form a crucial facet of the evolving design. We have introduced certain 'flexible' elements into our design concept, such as the Activity trees and the mini-buildings for activities, whereby consultation will guide the eventual direction and lay out. Consultation and participation can happen at many different levels, such as:

- Consideration – Because of the 'disruptive' nature of the eventual works and with all major schemes such as this it's important that all stakeholders concerns are considered.
- Participation – In addition to simply asking people their opinions and views – and cynically only ever giving them a chance to complain – other ideas around participation promote support and 'buy in' from the eventual users and those affected. From our experience, one the easiest way to do this is asking their opinion on a (selected) shortlist of ideas..
- Educational – A project such as this, and supported by an institution such as the Onassis Foundation with education as part of their agenda, provides a great opportunity for educational learning.

We have considerable experience of stakeholder management (identification, engagement, monitoring) and have various techniques and systems that we would propose to aid this aspect.



4.4 ARCHAEOLOGY AND HERITAGE STRATEGIES

We have paid particular attention to the architectural and historical significance of the area of intervention. It should be noted that our proposal neither introduces alterations upon the protected buildings, open-air spaces, sites, monuments or sculptures, nor comprise earth removal deeper than 100cm below the current ground level. Furthermore, according to our proposal, previously excavated and covered archaeological plots or sites in the area of intervention will remain undisturbed. The sole intervention process in these cases will be the replacement of the current pavement by our hexagonal flooring design and some greenery borders.

Naturally we are well aware that works in the area of intervention could yield new archaeological finds. In order to achieve uniformity in all the area of intervention, we suggest applying the same approach as it has been done up till now -for example in the case of the archaeological remains found during the construction of the Athenian Metropolitan Railway at Syntagma Square or at the junction of 11-13 Panepistimiou and 5 Amerikis Streets. This approach is based on the sequence «rescue excavation-consolidation-preservation-and-filling». Nevertheless it goes without saying that, in the framework of the current legal provisions (Law 3028/2002, "For the Protection of Antiquities and in general of the *Greek* Heritage"), we are entirely open to discuss with the Hellenic Ministry of Education and Religious Affairs, Culture and Sports any alternative suggestion and comment concerning the preservation and presentation of any finding.

Athens' history plays a major role in our proposal. The Greek words 'peripatos' and 'peripatetics', which we have commented above (see Chapter 2.3. **Brief Archaeological and Historical Commentary**), are key concepts in our project. We have conceived a "green corridor/peripatos" where modern Athenians could walk, talk and learn, in the same way as the ancient Athenians did during the Classical times. In this sense, our "green corridor" is also a "time corridor" connecting the city's past and future.

In our proposal, the different spaces of the intervention are linked with main themes of the Classical Greek culture analyzed by Aristotle and the Peripatetic School: thus, Omonia Square will host activities linked with the concepts of Concorde and Arts; Syntagma Square will be linked with the concept of Democracy; the Trilogy will be linked with the Philosophy; and the area of the Archeology Museum will be linked with Body shaping.

Under this approach we have envisage a series of strategies that aim to highlight the contribution of ancient Athens to the modern civilization. One of these ideas is to inscribe fragments of the Aristotelian corpus (i.e. the "Politics", "Virtues and Vices", "The Constitution of the Athenians" and others works) on the walls of our modules/boxes. These fragments could be read in several languages (Modern Greek, English, French…). As noted above, the walls of the modules/boxes will also reflect as a mirror everything they have around. So every local Athenian (either child, student, worker or casual walker) as well as foreign tourist could read the sentences of Aristotle while seeing his own image.

4.5 RISK MANAGEMENT STRATEGIES

From our experience of similar schemes, it tends to be the same issues that repeatedly create project problems and undermine the chances of success. We would combine a knowledge of these issues together with a formal risk management process to ensure all risks (and opportunities) are identified, prioritized and managed as appropriate. The eventual management action could involve removal of the risk (e.g. through a change to design), passing it to someone more appropriate to manage it (e.g. passing risk of material supply to the contractor via the construction contract) or insuring it (e.g. theft).

Some of the risks that we would expect, together with suggested management actions, are:

RISK	**MANAGEMENT ACTION**
The scheme is not approved by the authorities	Dialogue with the authorities would commence at the outset and.
Discovery of archeological artifacts	An Athens-expert archaeologist has assists us in this proposal as part of this multidisciplinary team. Our main approach to this would be to minimize all ground interventions and need for excavations and incorporate to the design any zone that the archaeological authorities could find interesting to do so.
Resistance to the scheme from local residents and businesses	Promote an active campaign of consultation and dialogue from the outset so concerns can be heard, considered incorporated.
Project cost exceeds budget	Delivery within the budget, is crucial. The eventual works, or part thereof, will rely on public funding and the budget therefore will be fixed. We will be estimated the costs throughout the design process and using this to guide the design; our team will be 'designing to a cost' instead of 'costing the design'.
Project takes longer than expected	A combination of both accurate programming and management of expectations is required. We would seek advice from both the local authority and possibly local contractors to ensure time periods are realistic.
Project design and works are not coordinated with the other projects in the area.	In circumstances such as this, we would expect that multi-project communications are established to ensure this does not happen.

5. DESIGN: ARCHITECTURAL ASPECTS

5.1 GENERAL PROPOSAL DESCRIPTION

The liberation of the space occupied until now by traffic leads us to reconsider how the urban space is used today. After the before mentioned analysis we identified the location for those existing activities

In parallel we have thought and consider which uses and activities are needed to be incorporated to the actuation to make it an attractive, alive and a nice area.

The analysis of these needed activities has not only been made from the visitor point of view, but also and mostly from the local Athenian, the accidental tourist, the casual walker, the citizen that walks to work, the students, etc… All these different profiles have different needs and demand different elements that have to be combined in a, harmonic and unifying proposal.

The resulting activities from the analysis of the different profiles have been grouped by affinity, proximity or functional needs:

BIG GROUPS: body shape – arts – university/philosopy – parlament/democracy

SMALL GROUPS: music – theater – literature/library

The location of the activities comes in one hand from the selection of the optimum location for each activity and in the other hand the groupping of different activities to empower each other. This criterion has helped us to set the different uses in the locations that are indicated here below:

a. MUSEUM OF ARCHEOLOGY AREA → BODY SHAPE

GYMNASIUM

Playground // Workshops (sports/archeology) // Sports machines // Basketball court

Ping-pong tables // Bicycle rent/Bicycle stop // Skatepark // Relax area (green+water)

Fountains // Café

b. OMONOIAS → ARTS AND CONCORD

MUSEUM

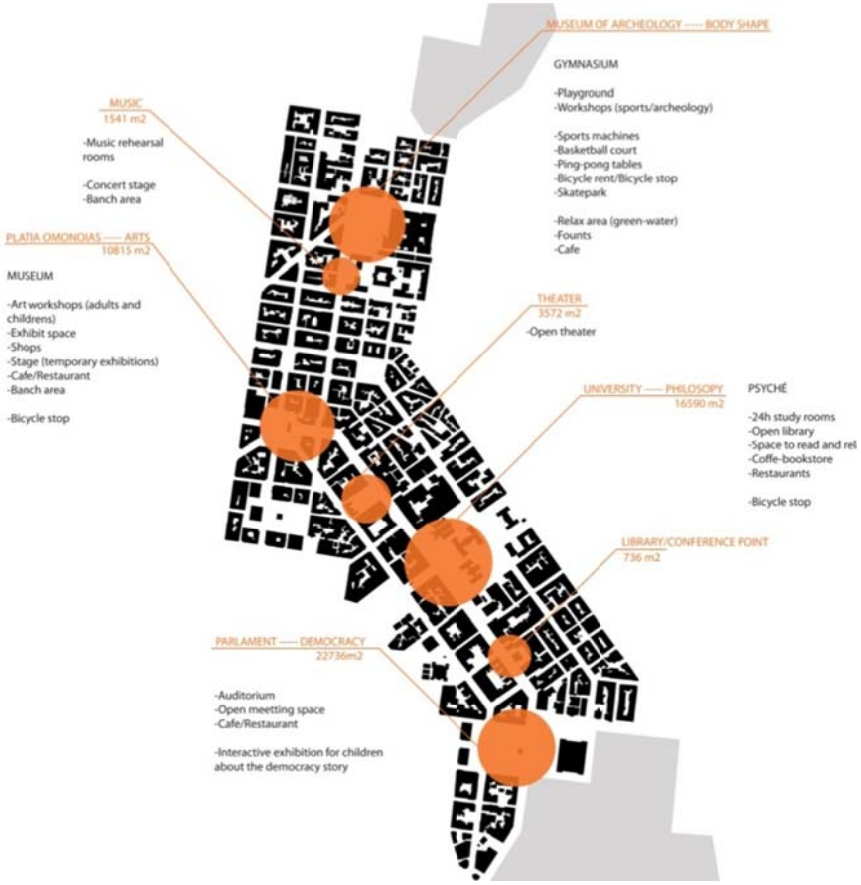
Art workshops (adults and childrens)

Exhibit space // Shops // Stage (temporary exhibitions) // Cafe/Restaurant // Bench area // Bicycle stop

c. UNIVERSITY AREA→ PHILOSOPHY

PSYCHE

24h study rooms // Open library // Space to read and relax // Coe-bookstore // Restaurants // Bicycle stop



d. PARLAMENT SQUARE AND AREA→ DEMOCRACY

AGORA

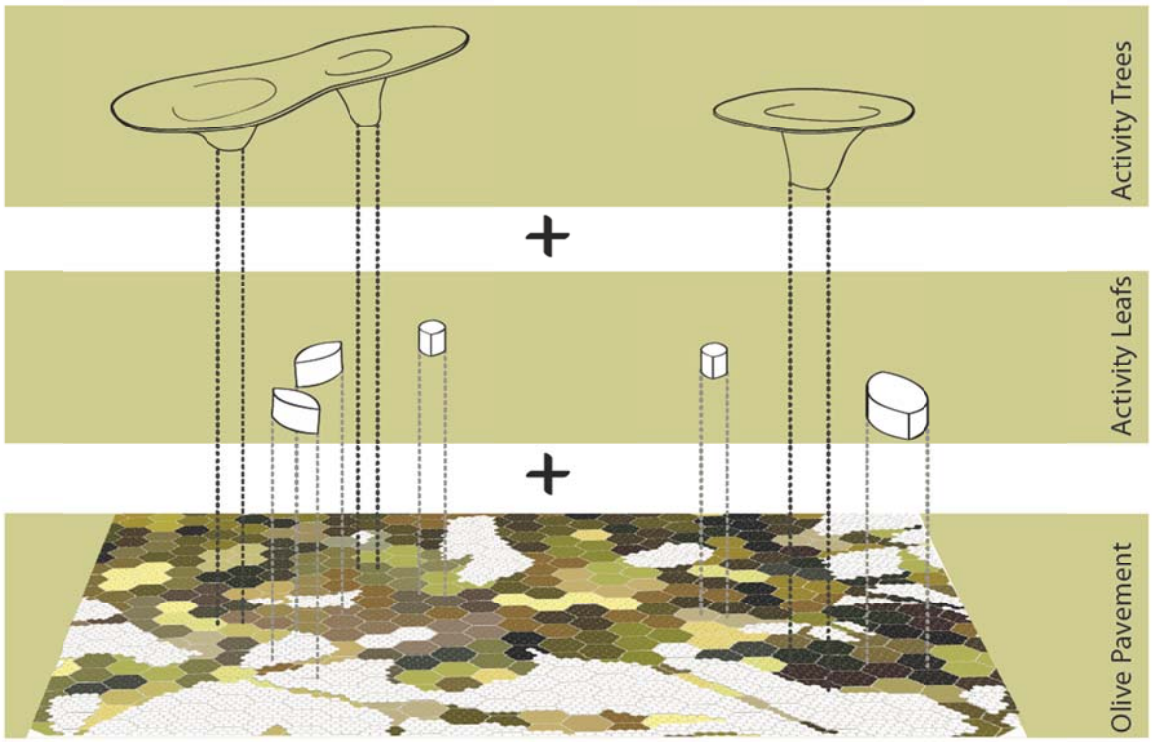
Auditorium // Open meeting space // Cafe/Restaurant // Interactive exhibition for children about the history of democracy

Regarding the small groups of activities, we have the following uses and activities:

e. MUSIC→Music rehearsal rooms and concert stage

f. THEATER → Open theate. **g. LITERATURE→** library and conference point.

5.2 MAIN DESIGN ELEMENTS



5.2.1 OLIVE PAVEMENT

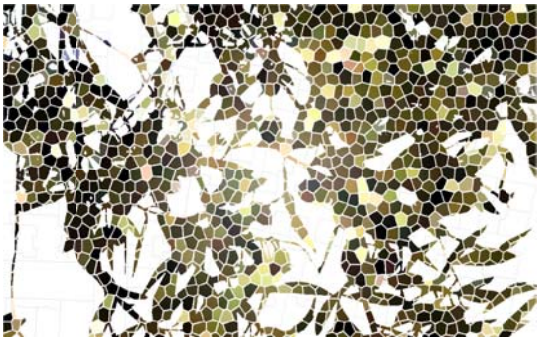
We needed to find an element that could give coherence and unity to all the intervention and also keep the sense of green corridor that connects the ends parks.

Treatment of the pavement was a major opportunity to address all these points, so it has been carefully designed the strategy by which this pavement is responsible for resolving this double demand.

MYTHOLOGY

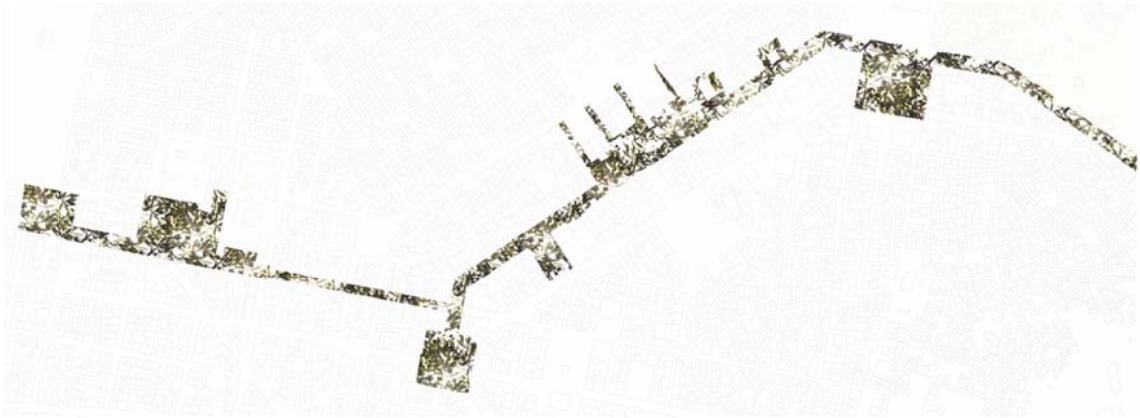
The research for this global solution was an opportunity to establish a link with Greek mythology. We propose an abstraction of the symbol of Athens, the olive tree. The origin of Athens according to mythology is related to the plantation of the olive by Athena (in fight with Poseidon for supremacy in the protection of the city). Poseidon was already savoring the victory when Athena began to explain the extraordinary properties of the olive tree: a strong plant that could live for many years and produce tasty, delicious fruits, of which men could extract an ideal liquid for seasoning food, give strength to the body, heal the wounds and illuminating the night. The victory of the goddess was overwhelming. Zeus decreed Athena as the winner by donating citizens the most useful plant and was granted sovereignty over the region.

All this tale seemed to us perfectly conceptually connected with the activities ideas and with other ideas of our proposal: time resistant, attractive, with strength and unity, which heals urban wounds, and enlighten the night.



To translate the olive tree light filtering effect to the floor we have chosen a hexagonal pattern that adapts to almost all geometries and situations.

The final solution is a continuous olive tree abstraction floor that tights all the intervention together and acts as a Green connection and a Green flow between the two parks at the ends of the actuation.



5.2.2 ACTIVITY / BIOCLIMATIC TREES

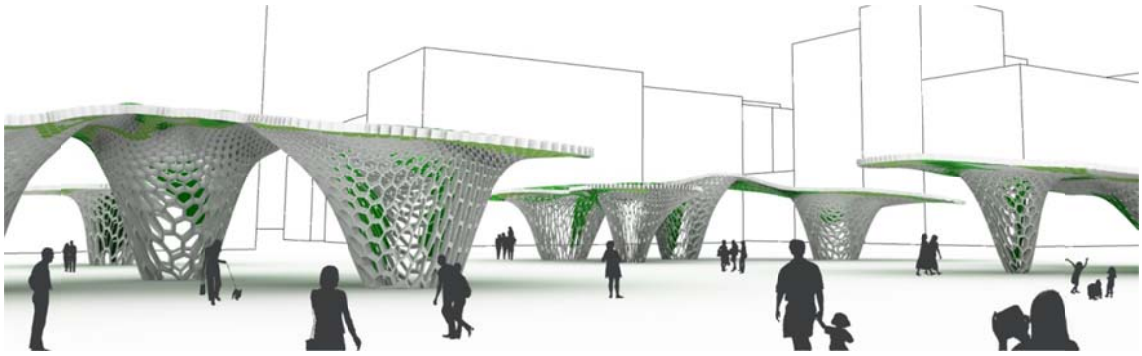
Many activities and public infrastructure as tram stations, metro exits, bus stops, etc need a protection roof. To cover these needs and trying to group up the activities at the same time, we have designed what we call the “Activity Trees”. These trees have a triple function:

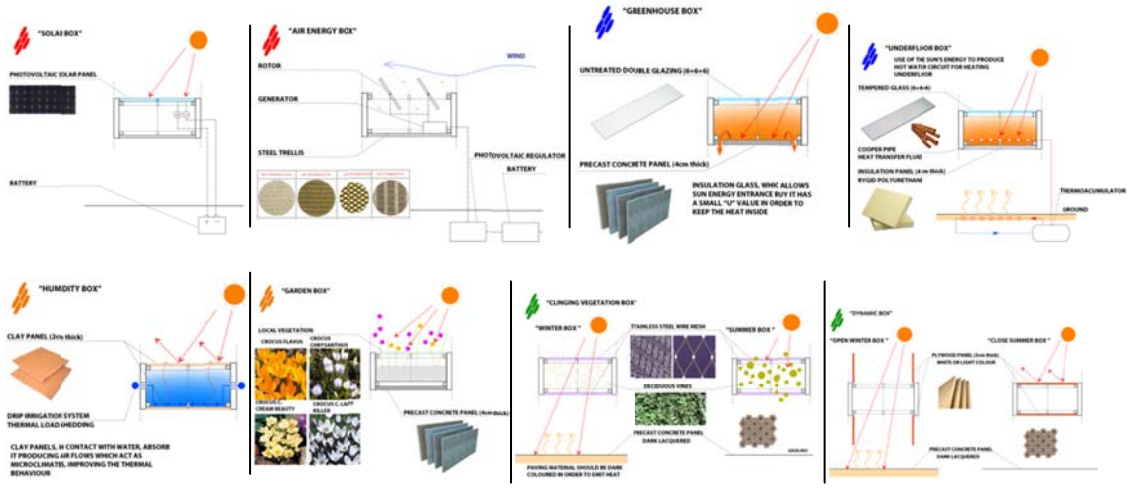
1. To give a shelter to the activities that requires a certain protection from the weather elements, that means protection from rain, sun light, etc… casting shadows or illumination spaces where needed by giving more or less density to the materiality of this shelter.

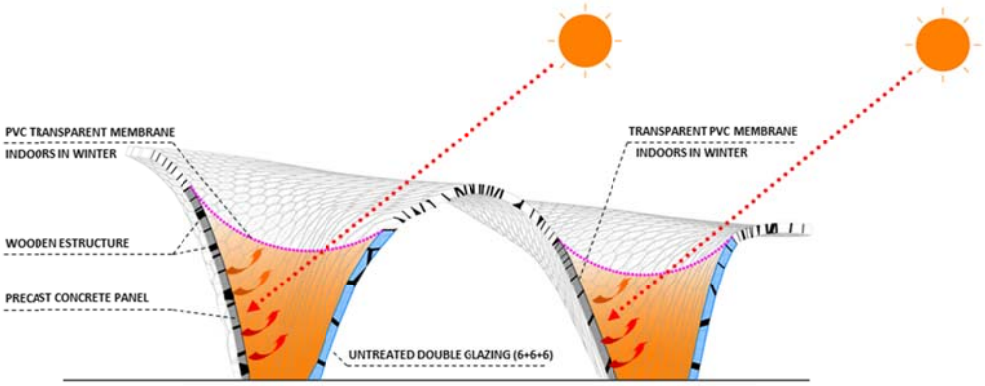
2. To offer a shadow and protection to the urban environment in general, creating spaces to stay, sit down and watch the people and the life pass.

3. To be an advanced bioclimatic device able to capture energy and water, producing and improved microclimate by means of the bioclimatic boxes explained in our panels.

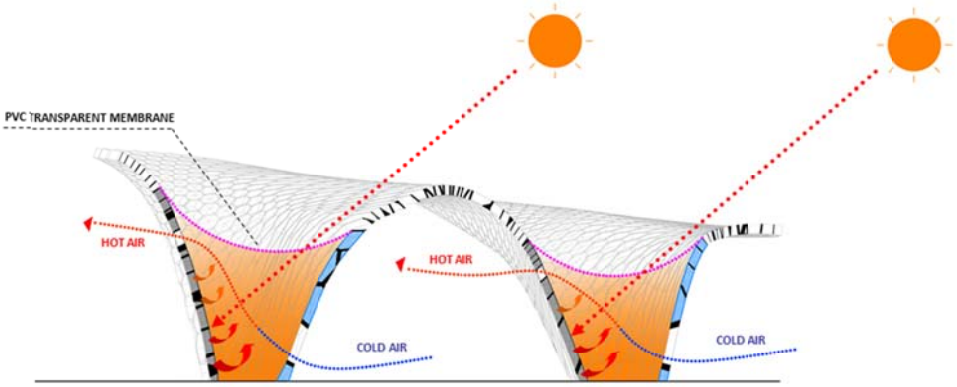
These activity / bioclimatic trees are a design strategy easy to be adapted and customized to serve the different needs that each group of activities could have, specially the need of a bigger or smaller weather protection, according to the nature of the activity.



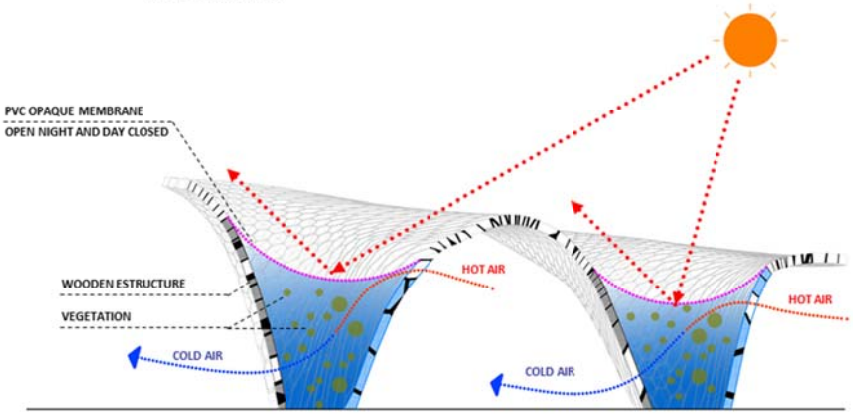




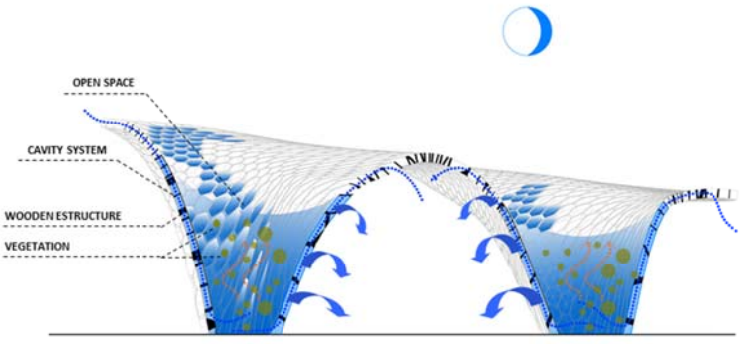
UPTAKE AND ACCUMULATION OF HEAT BY GREENHOUSE



AIR HEATING AND DISTRIBUTION AT THE TOP



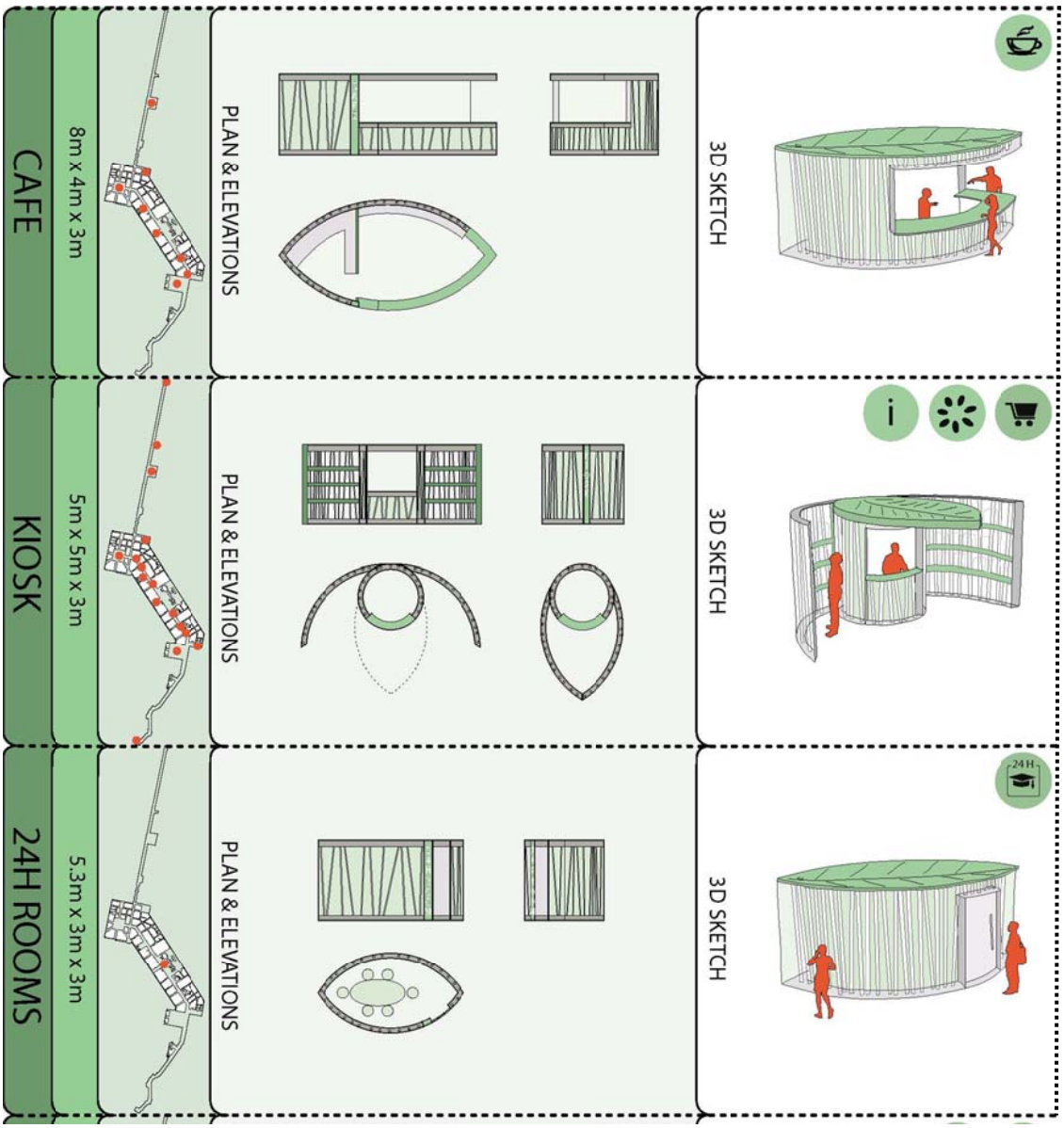
COOLING AIR DISTRIBUTION BY THE BOTTOM



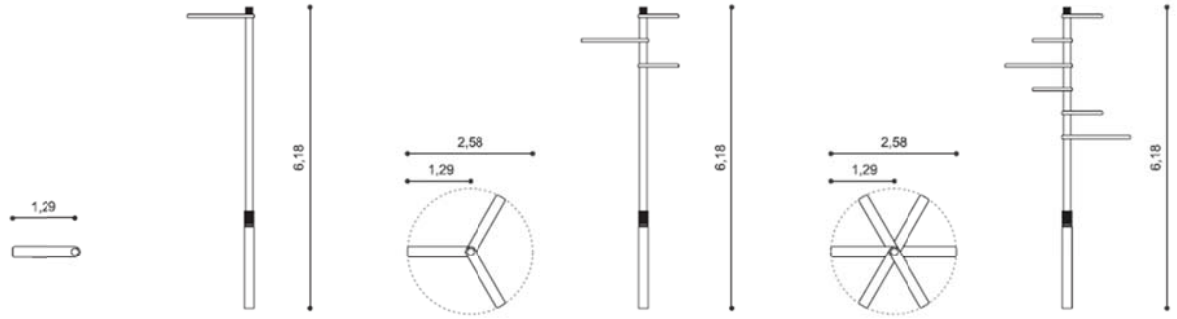
DAYTIME HEAT REMOVAL AND DISTRIBUTION OF FRESH AIR THROUGH THE AIR CHAMBER

5.2.3 MINI BUGILDING LEAVES AND URBAN FURNITURE

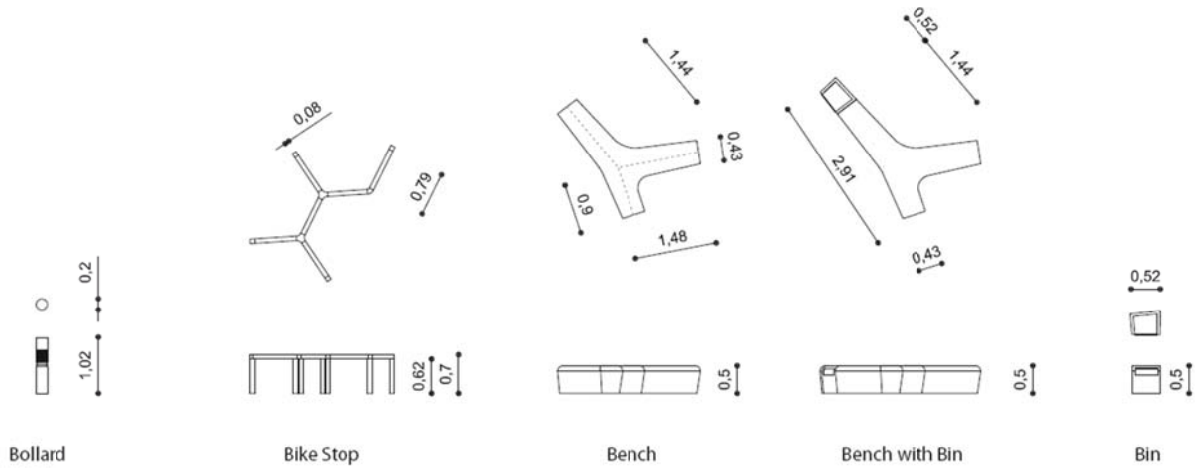
In a second level, some of the activities not only need weather protection, but also some functional control that means that they can open or close according to their working times and the needs of each specific element. For this intent, we have designed small constructions as mini floating buildings with a tree leave shape. Modules can be grouped if the activity requires bigger space (cafeteria, kiosk, study areas, library…). We offer a catalogue from which citizens will chose during the project phase which ones they decide to be implemented in which places. Also, new modules and uses are very easy to be incorporated following the same design principles.



Different urban furniture elements have been designed following the same global design style of the proposal, here are some samples:

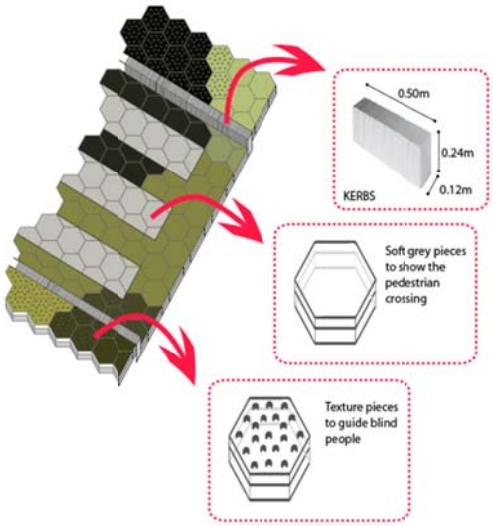


Street light_type 1 Street light_type 2 Street light_type 3



Bollard Bike Stop Bench Bench with Bin Bin

5.2.4 MATERIALS



The materials chosen are:

- Marble (white flooring parts of main streets and squares)
- Micro-perforated ceramic anti-slip tiles with porous concrete base (olive branches abstraction floor tiles)
- Natural stone (granite) kerbs
- Cement composite material (benches, bins, green areas borders)
- Cast iron (street lights and bycicle parkings)
- Wood + steel (activity trees and activity leaves)

6. DESIGN: TECHNICAL ASPECTS

6.1 URBAN SUPPLIES AND SERVICES DESIGN

Photovoltaic

High performance polycrystalline silicon cells Photovoltaic Panels are proposed to be integrated on the branches of the Activity/Bioclimatic Trees as part of the climatic boxes described on the panels.
The Power from PV panels will be used to supply the following: LED lighting, WIFI access points, water points, entertainment points, mini-buildings, etc. All the activity generated by the project will have a 0 cost in energy as it will be self-sufficient.
The PV panels installation will automatically transfer to the Distributor Network Operator supply by means of an Automatic Transfer Switch (ATS) in case the power required is more than the capacity of the PV panels installation.. The activity/bioclimatic trees will be connected to each other and will transfer the energy surplus to those trees that require additional energy in a certain moment.

Communication, monitoring and leisure

A WIFI network will provide internet connection to the users, as well as a series of Interactive Apps. Through these apps people will be able to interact with the activity trees and the environment around.
This network is used as well to control every element of the proposal, delivering integration and perfect management, monitoring energy consumption efficiency, creating and updating databases and statistics, etc…

Rainwater reuse
Rain water is collected in some of the activity trees and driven to the storage tank, where there will be a process of decanting and filtration, later the pump sends the water to irrigation areas.

6.2 STRUCTURE DESIGN

Activity trees: timber frames, hexagons-shaped, joining together by jointed ends. In this way, a very easily adaption to the tree double curvature is achieved allowing easy transmission of loads. In the outer perimeter, frames are joined by a galvanized steel cable. Foundation connections are carried out by hot-rolled steel plates, which allow rotation, producing an articulated joint.

MATERIALS

For the timber frames design wood of pine is used, defined as C24 according Eurocode 5 EN1995_1. The technical features are showed below:

	f_{mk} MPa	$f_{t,0,k}$ MPa	$f_{t,90,k}$ MPa	$f_{c,0,k}$ MPa	$f_{c,90,k}$ MPa	$f_{v,k}$ MPa	$E_{0,m}$ GPa	$E_{0,k}$ GPa
25 N/mm²	22	13	0,4	20	2,4	3,8	11	7,4

Foundations are made using reinforced concrete, defined by Eurocode 2, EN1992_1 from resistant class of 25 N / mm² as is showed below:

	f_{ck} MPa	$f_{ck,cube}$ MPa	f_{cm} MPa	f_{ctm} MPa	$f_{ctk,0,05}$ MPa	$f_{ctk,0,95}$ MPa	E_{cm} GPa
25 N/mm²	25	30	33	2,6	1,8	3,3	31

LOADS

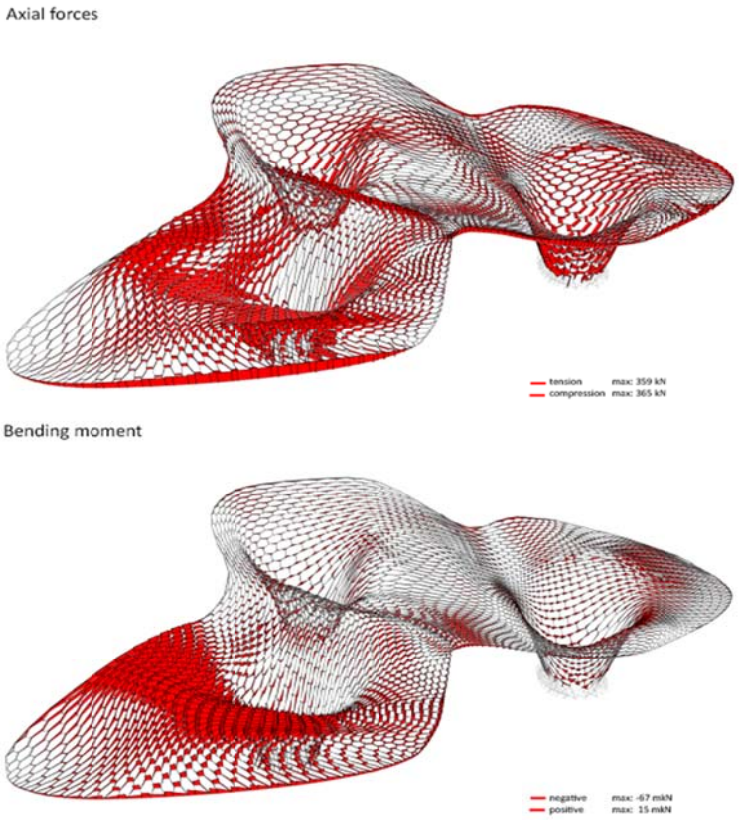
Loads used in the structural analysis are taken from Eurocode 1, actions on structures, EN 1991-1-3, according to localization of Athens, as well snow and wind loads.

STRUCTURAL ELEMENTS SIZE

In a first approach, activity trees frameworks are designed using 24 x 16 cm, rectangular sections, of C24 timber. The perimeter steel cable, size is ϕ22 that join the outer frames.

FOUNDATIONS

Due to the archeological factor a shallow foundation will be used for the activity trees. Thus, each tree foundations is made by a reinforced concrete slab, positioned coinciding with the center of gravity of the reactions, in order to deliver a uniform stress to the soil.



7 DESIGN: MANAGEMENT ASPECTS

7.1 COST ESTIMATION

Based on the competition submission design, an Order of Cost Estimate has been prepared to ensure that the proposed scheme can be delivered within the €25M budget identified. This estimate, based on the approximate quantities, totals €25.M (exc. taxes). This total has been calculated as follows:

Item	*Quantity*	*Rate (€)*	*Total (€ 000s)*
Paving / Surface Finish			
High quality finish inc sub-base	45.000 m2	100	4.500
Good quality finish inc sub-base	60.000 m2	50	3.000
Medium quality finish inc sub-base	50.000 m2	30	1.500
Note – The above rates allow for removal of existing and any changes to levels, etc.			
Lighting			
Lamp posts inc foundation	1.500 nr	3.000	4.500
Floor lights	5.000 nr	200	1.000
Lighting to modules	1.200 nr	250	300
Note – The above rates include all wiring and power			
Activity Trees – including structure and Bio Boxes.	4000 m2	750	3.000
Street Furniture			
Benches	500 nr	2.000	1.000
Bins	500 nr	200	100
Bicycle Parking (50 s.)	50 nr	10.000	500
Bollards	500 nr	200	100
Tree Grate	3.500 nr	200	700
Advertising Points	50 nr	2.000	100
Space Modules – Including special spaces like sceneries, theatres or exhibition spaces.	60 nr	20.000	1.200
Green Areas & Trenches –			
Grass and low planting	50.000 m2	10	500
Trees.	2.000 nr	300	600
Service trench reinforced with brick and filled with concrete.	2.500 m	80	200
Sub - Total			22.800
Preliminaries, site establishment costs, temporary works (12%)			2.800
Total including			25.000

This figure covers all the primary area of intervention plus a main part of the broad zone.
Using similar rates, the cost of the 'Extra Area' that would also cover all of the actuation including the most secondary streets of the broad area is calculated at a further €14M (exc taxes).

The above costs are based on approximate quantities of the main cost items together with reasonable allowance for these items. The rates are 'all in' prices including supply of materials, labor costs for installation plus all associated work. The prices have been established from the date-base of the team members and, where appropriate, discussion with appropriate specialist suppliers and manufacturers. These allowance are considered reasonable by the team and although the design has to be developed these stated costs will guide the team – they will be 'designing to a cost' instead of the team 'costing the design'.

7.2 COST MANAGEMENT STRATEGY

(Affordable – Buildable – Maintainable)

To ensure the best value is obtained through the ongoing design we will consider all elements from three different aspects, being:

- Affordability – Ensuring that the chosen elements are both affordable within the constraint of the overall budget but that also represent good value into the scheme.

- Buildability – Ensuring that the design can be procured and installed easily. This will involve working closely alongside the local authority to ensure that, where possible, benefit is obtained from any procurement models that already exist.

- Maintainability – Finally, the question of maintenance needs to be carefully considered. We are very aware that the success of this scheme, particularly in the eyes of the people of Athens, will be influenced in the long-term by the ease and ability to maintain it to an acceptable standard.

In addition to the practicalities of ongoing maintenance, we would also recommend the current management of the area is reviewed to see whether it remains appropriate. Issues to consider include:

- Identity –The design philosophy of our proposal presents a unique brand, and this could be reinforced by management.
- Additional contributions – Various examples exist of neighborhoods creating special urban groups to promote and support the public realm in their area. As long as benefits are demonstrable, these groups often involve an ongoing contribution towards the area
- Commercial activity – The design presents considerable opportunity for commercial activity in the area. Any revenue needs to be captured so it can be used to maintain the area (the demand of which will increase due to the commercial activities) and to retain a high quality to attract more interest

The above approach supports the ideas promoted in the 'EU Policies for Sustainable Cities'.

7.3 CONSTRUCTION PLANNING

Various measures can be taken to ensure the disruption and inconvenience during construction is mitigated. Together with the local authority and other stakeholders we would promote an 'inclusive' approach to construction phasing that considers the following:

- Involves all stakeholders to ensure that any concerns can be heard and considered and, where appropriate, incorporated.

- Ensure that visibility is shared amongst all major projects and events happening in the area so their impact can be considered.

- Consider, along with relevant stakeholders, the advantages and disadvantages of the two different approaches of (i) working on as many areas as possible to reduce the overall time of the works – a 'short sharp shock' – compared to (ii) phasing the works over various different areas so the impact at any one time is less but the overall duration is much longer.

- The abortive cost of any temporary works required.

The additional element that needs to be considered is the coordination with other projects in the area. In particular, the works will need to be carefully planned to align with the planned changes to the traffic circulation, tram and metro projects. Similarly, benefits may be gained by joining parts of this contract with others so, for example, economies of scale may be obtained through the contracting model.