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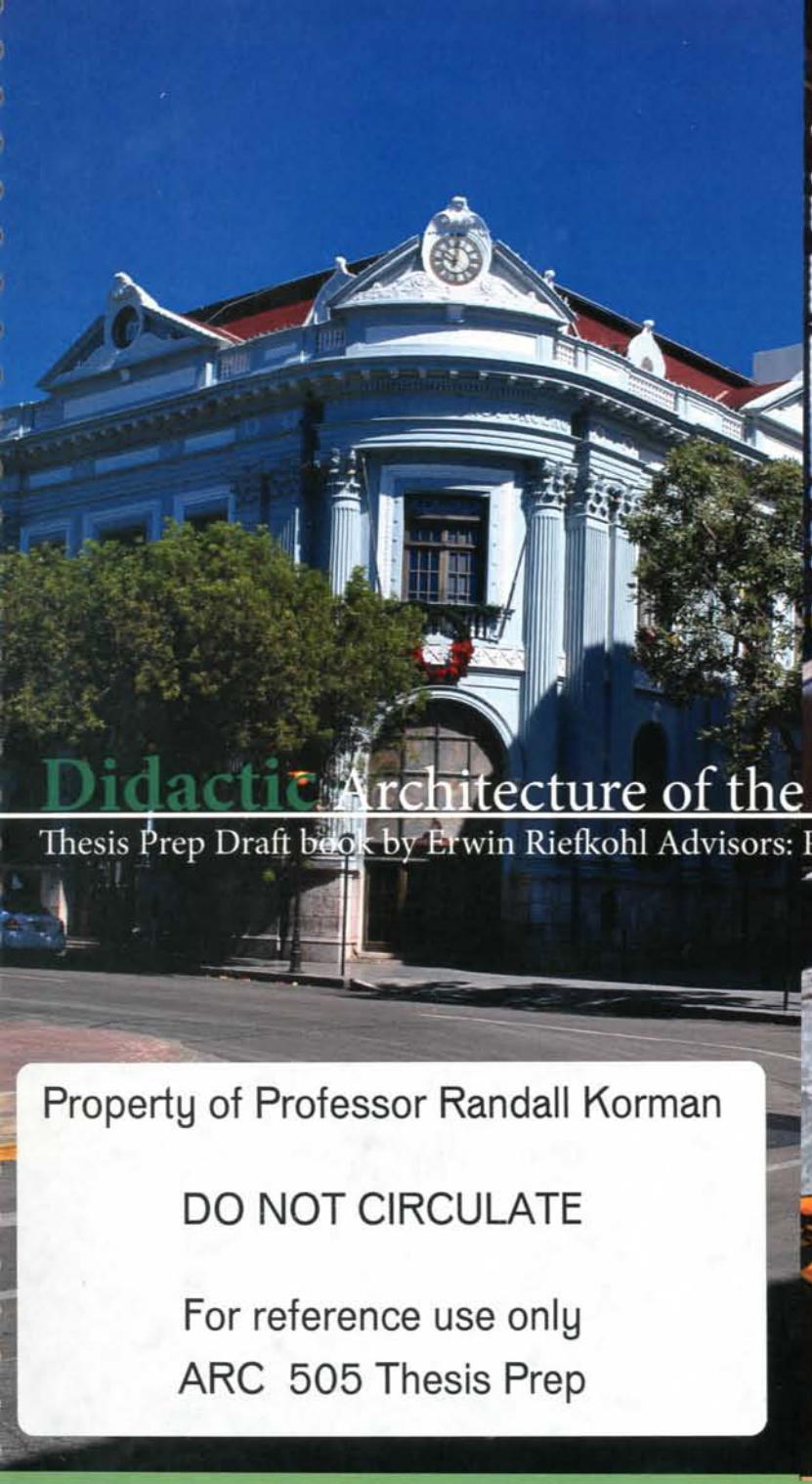
Didactic Architecture of the Caribbean Resort

Erwin Riefkohl
SU School of Architecture



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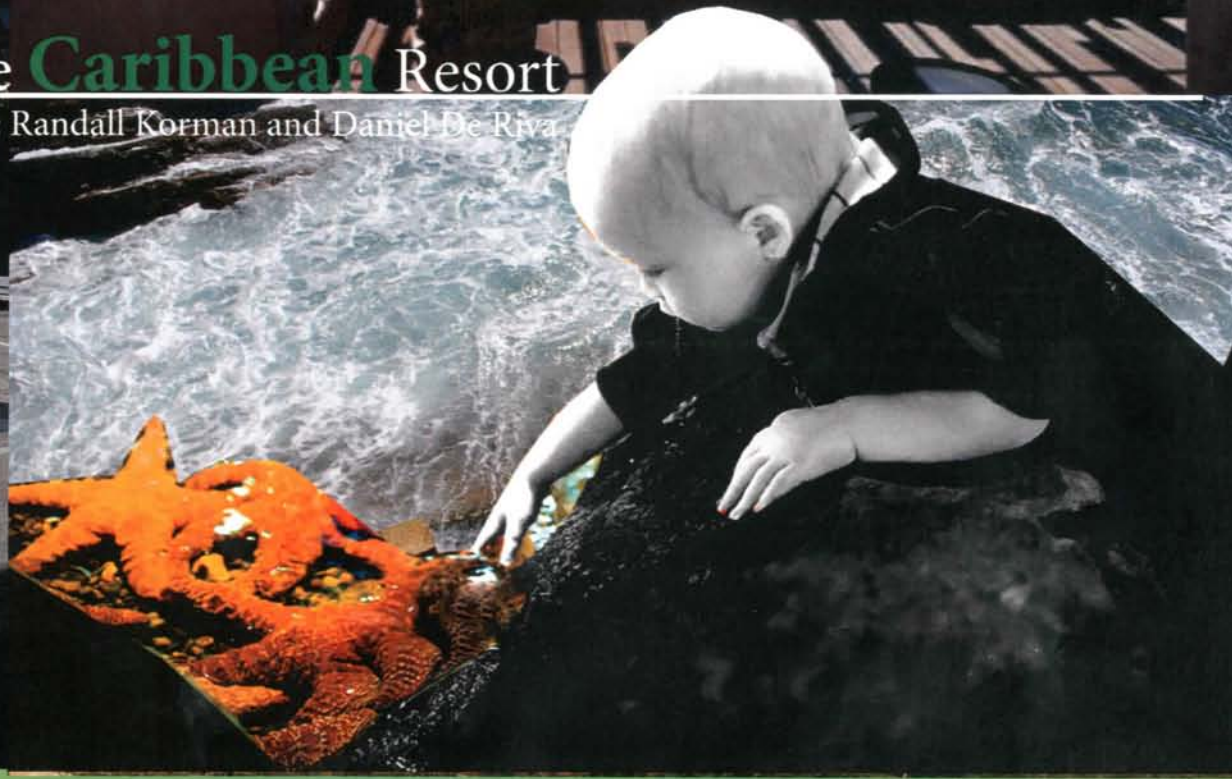
Thesis Prep Draft book by Erwin Riefkohl Advisors: Randall Korman and Daniel De Riva



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Thesis Statement:

I believe that architecture is a communicative artifact that has the capacity to carry meaning. Architecture has the capacity to reconnect us to nature and sympathetic to local Culture. The reconnection is made by the phenomenological experiences that an architectural artifact has the potential to provide. This architecture should be seen as a didactic tool that fosters a hyperawareness of the occurrences in the natural environment. This artifact is also reflects to local culture through the engagement of the theory of critical regionalism. As a sum of these two ideas the artifact will be designed with intent to foster meditation on our relation to the world's phenomena.

Abstract

This thesis will design a Caribbean resort that functions as a didactic tool for responsible tourism in the region.Today we live in a global society that is increasingly aware of its ecological footprint.We also live in a world where nature is more and more threatened by human actions. As a result, there has been a growing need for ecotourism, which is defined as "responsible travel to fragile, pristine, and usually protected areas that strives to be low impact (Iacobucci13). Ecotourism intends to educate the tourist and generate funding for ecological conservation.

For the Caribbean, ecotourism is important because tourism is the primary industry. The resources for tourism are the beaches and tropical ecosystems, which are being threatened by the development of big hotels and mass tourism. If we think of responsible traveling, the first step is creating the setting for human activit in the form of eco resorts and eco lodges. As stated in The Encyclopedia of Ecotourism: "If the built environment fails to meet the high standards of ecotourism the movement is poised for failure"(Blamey 9). Many would agree that architecture has the power to make the armature or structure for an eco resort. I would argue that architecture not only has the ability to make ecotourism sustainable but also to make it didactic or, in other words, designed to teach about the ecosystem and responsible travel.

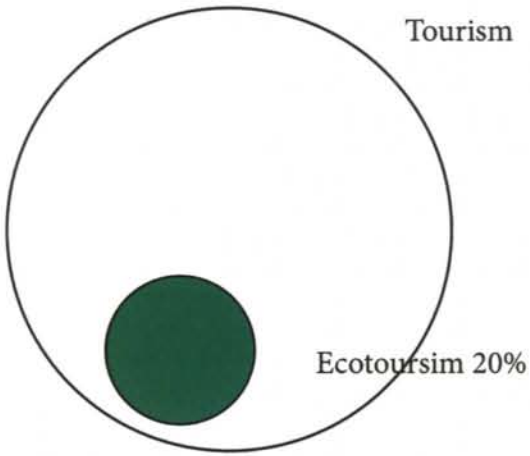
Didactic architecture teaches by sending visual, tactile and even auditory messages to theuser. Visually, an eco resort can act as a window to the natural world or as a vehicle for environmental learning and understanding (Lindberg 217). In tactile terms didactic architecture has the opportunity to embrace building systems as methods of teaching. For example, the eco resort can have louvers or other types of building envelopes that are operable so that guests can interact with the climate in direct ways, therefore learning about cross ventilation and sun angles.
As a result guests can learn about the climate they are visiting and how the architecture of that particular region responds to it.

It may seem that an eco resort is just a place to study and contemplate nature, just an observation tower, because it is limited by the need to have a low impact, but that does not have to be the case. In fact, it could be the other way around; it could be a dynamic place that fills its guests with excitement. A good example of dynamic eco tourism is sailing, where people learn by doing in many dynamic ways, but with little to no impact on the environment.

Although one would think that all eco resorts are low impact and culturally, economically and ecologically responsible, through research I have found that these resorts are few and widely scattered. This should serve as an encouragement for architecture to develop eco resorts into the standards of eco tourism. This thesis will attempt to develop an eco resort in the Caribbean using five strategies: good analysis of case studies in how eco resorts handle the balance between culture, ecology and economy; examination of precedents showing how architecture can be didactic; an understanding of critical regionalism and how it expresses culture in architecture; the selection of a potential site; and the study of the culture, economy and ecology of the potential site.

Introduction to Ecotourism

Introduction



Based on graph in blamey book. Used also in Dominics Icabucci book or

Tourism, for most of us, is the way we take a break from our daily routines, to learn about culture, history, art, different life styles or just to relax. In tourism one thing is for certain: where ever we go, we appreciate what we are visiting or at least we think we will appreciate it." Rarely we ask ourselves if we are contributing to the environment in ways that preserve what we value so much. We usually don't ask ourselves how much cruises, hotels and tours harm the places they visit. We as tourists usually don't ask what is the impact of tourism ?

Sometimes, tourism makes living culture move somewhere else. For example, the space around Il Doumo in Florence is a space that has been converted into a tourist bubble where you hardly see locals in their daily routines. Business is dedicated to tourism and that's ok, because it generates an income for the city that would not exist otherwise. Sometimes the loud big crowds are not pleasant for everyday life. As a result, in Florence, locals were made to move away from what was the center of their culture for more than five hundred years. Florentines cannot enjoy a traditional Sunday where the go to church in the center and stroll around the piazza. Large big crowds could also stress an ecosystem and eventually cause harm.

The Doumo is a tourist attraction. One can go and take a picture and that's it. For 80 % of people this is enough. The other 20 % realizes that they are not getting the full experience. They realize that they cannot get the full Florentine experience in that space. They are not it contact with the culture or with nature. They wanted to have authentic Florentine food and they did not find it. They

ask themselves why are tourists not always appreciated in by locals. They ask themselves why do the beaches in front of the "Caribe Hilton" have no fish and then they realize the impact tourism has on a place, irresponsible tourism harms tourism. That 20% finds out that they need to be responsible tourists so that the can get the full experience. They learn need to be respectful to the culture or nature of a place in order to enjoy it.

If we think of maximizing the experience in the places we value, while minimizing our impact and potentially giving something back, we are thinking in the main pillars of ecotourism. People often have the impression that ecotourism is just about nature, but it also has to do with social factors as well. Although ecotourism can have different meanings for different people, I think most would agree that its about "responsible travel" which should be ecologically, culturally, economically, and socially sustainable.

In thinking of ecotourism I can't help but think how parallel this thinking about tourism is to architecture and sustainable architecture. In part my thinking agrees with Dominic Iacobucci and his gradute thesis on ecotourism and architecture. Sustainable architecture aims to minimize the stress and maximize what you can get for free in the site. Similarly, tourism should do the same, minimize stress on the culture or nature and maximize the experience. A good example of ecotourism is an expedition that is done in the Camuy caves in Costa Rica where the impact to the ecosystem is calculated to the inch. Every footstep is mapped so that there is the minimum impact to the environment, but the environment is harnessed to the extremes. Sip lining from peak to peak one can see the caves by just touching in key points but using the geographical elevation features to push the adrenaline and also jumping in the water downstream to exit the cave, which is an exit sequence that has no impact. Dominic Iacobucci wrote:
"This concept of preservation, known as ecotourism, not only seeks to create a sustainable connection to nature, but it strives to educate tourists on how to preserve the world they wish to experience as well as the world in which they live. The rise of ecotourism in the tourism industry has a parallel movement of sustainability in the building industry. Architects are continually seeking to become more environmentally aware and design their buildings to harness, rather than react to, the natural environment. Planners and architects are working towards green construction, environmental design, and new urbanism. The governments of the world are continually trying to improve the sustainability, effectiveness and universal use of services through creating legislation and guidelines that protects that environment. "

Although Iacobucci talks in reference to the ecosystem, we can image how ecotourism could also preserve culture and social factors as well. There are many cases in which tourism displaces local's community and they never recover. A popular example is the Massai tribe in Africa, that where displaced by a wildlife park. There is such a thing as social sustainability that we address in architecture that also has to do which ecotourism.

Ecotourism as a Movement

Looking at eco tourism more closely one can start to find more things that sustainable architecture has in common. The concept first used by a Mexican architect called Hector Ceballos-Lascurain in 1983. He popularized the term by making sustainable jungle tourism. Cembalos concentrates on the design of what he calls environmental architecture which can be described as a He has naturalistic reinterpretation of jungle huts. Ceballos made designs for many eco resorts lodges and master planning for ecotourism.
Since then ecotourism has become increasingly popular over the years as the movement for sustainable architecture. Costa Rica is one of the most popular and most developed destinations for ecotourism. In Costa Rica, we can see how ecotourism has taken many directions. It first started with just expeditions to the jungle but has developed into eco lodged and eco resorts. One could say ecotourism is not just a movement but also a style of travel.
There are many types of ecotourism, corresponding to the many kinds of tourism.

Adventure tourism-A form of nature-based tourism that incorporates an element of risk,
Higher levels of physical exertion, and the need for specialized skill. (T.I.E.S 3)Examples of this type of tourism are white water rafting, diving, hiking and sip lining but minimizes the impact on the environment and prompts to educate the participant in coservation.

Geotourism-Tourism that sustains or enhances the geographical character of a place-its environment, heritage, aesthetics, culture, and the well being of its residents. (T.I.E.S 3)

Pro-poor tourism-Tourism that results in increased net benefit for the poor people. (T.I.E.S 3)

Responsible tourism-Tourism that maximizes the benefits to local communities, minimizes negative social or environmental impacts, and helps local people conserve
Fragile cultures, habitats, and species. (T.I.E.S 3);

Sustainable Tourism-Tourism that meets the needs of present tourist and host regions while protecting and enhancing opportunities for the future. (T.I.E.S 3)

One could say that although the program changes in ecotourism and in architecture; the values of sustainability are still there, and that is what makes ecotourism to me so interesting because it challenges the creativity of the people who design it.Since the movement has gained popularity, there has be an increasing amount of cases of green washing tourism products to call the ecotourism and sustainable where they are really not. As we have seen in many cases in the building industry where people highlight one supposedly

green aspect and call themselves green without really being sustainable. The sad part is that inexperienced people fall for these types of marketing strategies.
Since 1983, ecotourism has developed levels or sides of where eco-tourism.

Exploitive, Passive, and Active Ecotourism

Eco tourism is categorized by the type of impact it has on the environment. Exploitive results in a damaging impact to the environment. Passive has little to no impacts to the environment. Active has a positive impact on the environment. (Iacobucci Dominic)

Soft and Hard Ecotourism

This division depends on the level of dedication the eco-tourists have. How far they go towards leaving as little of a footprint as possible. (Iacobucci)

Natural and Unnatural Ecotourism

This represent a division of people that believe that ecotourism should be a natural and should not depend on technology to sustain it and the unnatural ecotourism which depends on technology to support it. The natural could be taken into the extreme by saying that humans should interact only in passive ways with nature. (Iacobucci) Passive would mean the observation as a pristine enviroment in ways that one has no direct interventions with nature no mater how minimal they are.

Form these divisions we can see what are the major the debates in the industry. We can also see that is not as easy a being eco-tourism or not but it an issue of how depth and how you achieve that depth. Which is very similar to the debate in architecture about sustainability. There is always the question: will we even achieve total sustainability? One could ask as in the building industry we have Leed the tourism industry there is called Green Globe which rates the performance of tours and hotels alike.

Facts about Tourism:

• As the largest business sector in the world economy, the Travel & Tourism industry is responsible for over 230 million jobs and over 10% of the gross domestic product worldwide. (T.I.E.S)

• In 2006, Travel & Tourism (consumption, investment, government spending and exports) is expected to grow 4.6% and total US $6.5 trillion. (T.I.E.S)

• Tourism is a principle "export" (foreign exchange earner) for 83% of developing countries, and the leading export for 1/3 of poorest countries. (T.I.E.S)

• For the world's 40 poorest countries, tourism is the second most important source of foreign exchange, after oil. (T.I.E.S)

Facts about Ecotourism:

•Beginning in the1990s, ecotourism has been growing 20%-34% per year. (T.I.E.S)

• In 2004, ecotourism/nature tourism was growing globally 3 times faster than the tourism industry as a whole. (T.I.E.S)

• Nature tourism is growing at 10%-12% per annum in the international Market. (T.I.E.S)

• The United Nations Environment Program (UNEP) and Conservation International have indicated that most of tourism's expansion is occurring in and around the world's remaining natural areas. (T.I.E.S)

• Analysts predict a growth in eco-resorts and hotels, and a boom in nature tourism - a sector already growing at 20% a year - and suggest early converts to sustainable tourism will make market gains. (T.I.E.S)

Economics of Ecotourism vs. Mass Tourism:

• In Dominica, in the Caribbean, "stay over " tourists using small, nature-based lodges spent eight times more than cruise passengers spend while visiting the island. (T.I.E.S)

• In Komodo National Park in Indonesia, independent travelers spend nearly Us $100 locally per visit; package holidaymakers spend only half this. In contrast, cruise-ship arrivals spend an average three cents in the local economy. 80% of money for all-inclusive package tours goes to airlines, hotels, and other international companies. Eco-lodges hire and purchase locally, and some times put as much as 95% of money goes into the local economy.(T.I.E.S)

• The daily expenditure of cultural tourists (over €70/US$90) is higher than visitors on a touring holiday (€52/US$67), beach holiday (€48/US$62), city break (€42/$US$54) or rural trip. (T.I.E.S)

(T.I.E.S) Cosumer demand surveys

• In a U.K. survey, 87% of travelers said their holiday should not damage the environment; 39% said they were prepared to pay 5% extra for ethical guarantees. (T.I.E.S)

• 53% of American travelers say their travel experience is enhanced when they learn as much as possible about local customs and culture. (T.I.E.S)

• 95% of Swiss tourists consider respect for local culture to be highly important when choosing a holiday. (T.I.E.S)

Profile of Ecotourists:

An experienced traveler

Has higher education

Higher income bracket

Age: middle-age to elderly

Opinion leader

Ask & tell their friends & colleagues about trip

Are the most important source of trip information

Tiamo Resorts South Andros Island, Bahamas

Typical cottage in the resort we can see is very open to allow light and ventilation. This is empasied in the roof condition and in plan

Landscaping used to minimize the visual impact of the pv panels, also one can see the structure used to hold the panels in made to minimize the impact on the ground

Snorkeling example of active activities done in ecotourism

The Tiamo resort is regarded as one of the best eco resorts in the world. This is a resort that integrates many sustainable strategies to make the guest stay as emissions free as possible. The resort complex has the biggest privately owned array of photovoltaic panels in the Caribbean. As a result they produce 100 % of the electricity they consume in the resort. On interesting feature is that the resort has composting toilets that are operated by the staff. This is a good detail since this kind of waste is the most damaging in the shores. The grey water is reconditioned by filtrating it with plants and rocks. The design of the building is well thought out by using the buildings orientation for cross ventilation. The building also has a balcony with long overhangs that wraps around which also helps minimized solar gain and provide shadow. The building impact on the ground is also minimized, by having simple wood frame construction elevated on Pillars. This is also a good idea in tropical climates to have the foundation cross ventilate humidity and for avoiding floods. This resort in an example that true comfort can be achieved in a eco resort. The problem is that this hotel has no architectural qualities I gives the impression to be the typical tropical cottage not a state of the art resort. Also it is not very culturally suggestive.

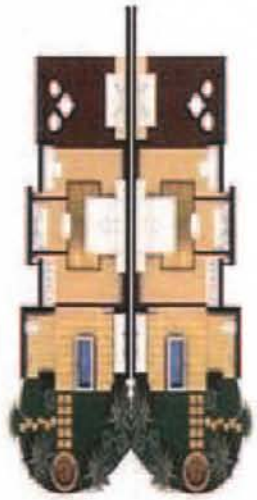
Precedents of Eco Resorts

Kona Village Resort and Eco resort Diva in the Maldives

The Kona Village Resort is a development made in Hawaii. Being on ancient royalty land and an ancient fishing village the resort had to be very culturally responsive. We can see this in the resort with the emulation a polynesian style bungalows. We see how they used tropical materials and local construction techniques. The resort is very culturally sustainable but it has no forms of renewable generators, two diesel generators provide the energy

In these cotteges culture is being represented through diferent types of tectonics. the beams of the floors and roofs, the railing in the balcony. Also they use of regional materials and methods of construction.

In this image of a typical hut a diva resort in the Maldives



typical plan of the hut.

view of a villa conecting to the water. i like the idea of conecting elemets of the building tho the horizon line .

Looking at these precedents one can begin to see design aspects that start to heighten the contact with nature throughout the stay in an eco resort. The first is open plan; one can see that the space is connected by a big roof which allows for light, breeze and views to penetrate the whole space. We also can see the emphasis on the horizon lines; especially with blue colors that make the connection with the sea horizon lines. In this project we see the use of materially. Especially dry to make a connection to the environment. We can also see how it is used in different scales for different for different aspects. One can assume, that there is an interest in privacy and contact with nature in these spaces that is important to maintain in the design of a room.

Precedents of Eco Resorts
Resort in Kangaroo Island

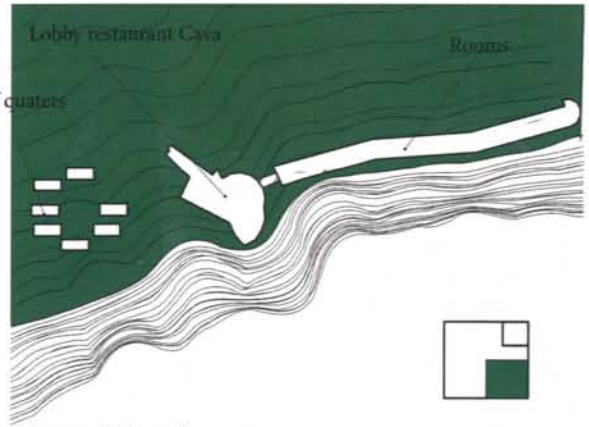


Diagram of site parti
Program and size
Main space including restaurant cava and lobby 23000 sqf
Rooms 1090 sqf

Porch space 278 sqf

Detail of water collection roof Configuration with low piched roofs and aluminum tanks on the end

This an Elevation of a suite in the resort, one can see how by elevating th building above the vegetation one can get unobstructed views while also minimizing the damage guests could have on the landscape by interacting with it. Also buy-having nature flushed with the building there is more of a feeling of closeness

This is not your typical beach bungalow resort. This is a modern facility that tries to address all the areas of sustainable design. The building has an aggressive parti that lines the suites along the edge of the cliff. The sectionality in that parti helps control the impact of the guests have to nature because they can only touch what it is allowed to by the building design. the site has no clearing of land other that what is occupied by the building the vegetation almost touching the building. As a result they get unbelievable closeness to nature with out touching it be because the have been elevated. The closeness to the cliff makes hearing the splashing of the waves and understanding de grandiosity of the sea in front of them.

When we zoom in we notice that the building has many sustainable feature like the rain collection roofs with a very expressive yet perfomative structure that expresses where the water goes in. these roofs resemble the roofs of Australian architect Glen Murket especially in the corrugated aluminum water collection tanks.

The resort also has a natural gray water treatment facility. Another important aspecto of this hotel is that the staff lives on site so that space is also provided for them. Culturally the resort displays in many ways it uses local fabrics for the interior and displays many sculptures and paintings.

The Problem with Eco Resorts

The Problem

Barcelo Resort Mexico

Sandals Resort Jamaica

Looking into ecotourism I asked, what problems do I see? Many of the eco-resorts and lodges portray themselves with signs and symbols in the architecture that are not helpful or in tune with the values of ecotourism. I found that the problem of "green washing" or the use of deceptive use of the terms such as "green" or "eco" is worse than the one in the building industry. Also I found many problems with the symbolisms the architecture portrayed. For example, an eco resort cannot pretend to be a "home away from home" because that's not the reason one goes to one in the first place. In other words, an eco resort cannot look like a Best Western with some Pv panels on the roof. There is a reason why business hotels make an effort to look like a home as much as possible because that what people are looking for. For an eco resort a home away from home is not the appropriate meaning. Yes, it is going to have the ideas of shelter and comfort but the architecture must convey a different meaning. It should convey that it is a means to get closer to nature in a responsible way. On the other side of the spectrum we have the cheesy hotels that portray an exotic meaning to the hotel. We could say they try to convey a sense of uniqueness, but fail to convey the uniqueness of where it's standing. Examples of these types of hotels are many. The Sandals Hotels are a good example of a hotel that conveys a romantic sense of paradise that has no relation to the region. They have the arched bridges across pools and the dolphin mosaics. From this discussion about what is the purpoase of architecture for ecotourism, which is what Icabucci talks in his thesis, we can see that there is no clear language or no clear symbols in regards to the architecture of ecotourism. Sustainability is one of the main pillars that should make up the meaning conveyed by the architecture but should not be the only one.

When thinking of the architecture of a unique place, a reserved space, one would think that the architecture must convey that in it's meaning by displaying or framing the space in ways it conveys the uniqueness of the location. A example of a similar idea are museums which usually try to be as important as the art, it houses; in side but not compete with it. There has to be a balance between the architecture and the displayed. One cannot over power the other. Furthermore; the artifact must also be critical of framing the particular phenomena that characterizes the region. This connection is usually why people go to these places, So that the guest feels or connection to the region they are visiting. Why can't the architecture function as an artifact to that end? Once we feel the connection to nature it is easier to be responsible to it because we have appreciation of nature and an understanding of how dependent we are of it. Also the architecture should also represent the traditions of the region. The eco resort should be critical in the way it represents them so that it does not overpower the actual place that it is trying to display, but it should give a sense on how it feels to live in that region. This is a way in which the hotel does not feel a home away from home but in a new home in that place that is appreciated so much. As Chistian Norgberg Shuz talks about in his book Genus Loci, any place that is meaningful will people will feel at home.

Another way in that the architecture of eco resorts fails to reach the expectations of ecotourism is-by failing to educate its guests about sustainability and conservation. To me this is a lost of opportunity because the guests can learn actively about the climate they are visiting if the are allowed to engage more with the climate and allowed to understand how to harness the in responsible ways. Through education the guest become more aware of their impact and hopefully be less exploitive and "more active eco-tourists". This education could make eco tourists more aware of their responsibilities to nature in general instead of just the region they are visiting. Architecture could have a big role on changing from exploitative ecotourism to active eco tourism.

This could be done by making the visitors hyper aware in their environment. heightening the guest awareness of the natures phenomena eco resorts can make their inhabitants more connected to nature. By being more connected the would be more sensible about the value of nature. Also the architecture eco resort could allow for interaction only in moments or locations where in puts the least amount of stress on the environment. As a result the eco resort makes a clear distinction between where one can iteract with nature an where one should not. The eco resort is a place that should also exemplify what means to be sustainable. Through that it should make its guests aware of what what are the kinds of strategies are employed to make and their desired comfort levels sustainable.

I last year, I studied a semester in London where I lived in a typical Mansion block Flat (apartment) in Notting Hill. From my stay; I learned about the architecture traditions in London and the social traditions behind them. What I did not learn was how could that life style be sustained. It wasn't until I visited the Bedzed, a cero emission community using the same typology of the apartment block that I really understood how the climate in that particular region could be harnessed to reach the desired comfort levels of a London Flat (apartment). I learned how much insulation was needed in that climate, how much less energy was need for an thermally efficient house, I learned that the could have green roofs an water collection. One could see clearly the ability of the houses had to adapt

to deferent seasons and learned about how the summer must be like because the architecture told a story about how the building is configured to harness the summer season. One could see how the house could be opened up for ventilation or for more lighting. Also I leaned about different sustainable materials and building systems in that they have in England. It was not that one experience was better than the other but that the combination of both which gave me a sense of the tradition as well as the future. Moved by both of the mansion blocks I translated the ideas learned into a tropical context and made changes into my house in San Juan. I believe that an eco resort should be a place that shows us new environmental way to live and that hopefully one would adopt on some of the to their lives back in civilization. So is not just that the place in making the guest a pro to that environment but also making it a pro to the environment in general.

As human beings we are deeply connected to nature, yet more and more that connection is being replaced by our connection to machines and we are forgetting our need for nature. Also, we are not aware of how exploitive we are on nature. The purpose of the eco resort and eco tourism in general should be to create a lasting connection between each individual and nature. Instead of making the connection for the stay of the vacation making the connection so that the guests are more conscious of our deep connection to Earth. The eco resort should serve an artifact that magnifies our senses perceptions making a deeper connection to nature. By creating this deep connection we create individuals that will be more conscious of nature and the effect they have on it and that will further look for this type of experience over others. so we are generating a make for this type of experience and performative architecture.

Didactic Methods: Designing to inspire Learning

"Study nature, love nature, stay close to nature. It will never fail you."
- Fronk Lloyd Wright

The act of Learning can be complex and multifaceted, **but there will always be 6 channels through which we can learn. They are visual, auditory, tactile, olfactory, taste and kinesthetic.** Every channel deals with different types of sensory learning. Not all people learn in the same way, this is often referred as multiple intelligences. While some people can be more visually like us architects others can be more kinesthetic.

John Dewey
"People learn by doing" said John Dewey. That is the Pilar of didactic architecture. peole learn through their experiences through their interactions.

Launch, Explore, Summarize

Launch- strating experience or activity that serves as motivation for students to engageand want to learn.

Explore- activity that fosters students ability their own strategies to learn

summarize- action that motives students to share their strategies of exploration with others.

Montessori Method

The Montessori Method is a child-centered, alternative educational method based on the child development theories originated by Italian educator, Maria Montessori, in the late nineteenth and early twentieth centuries. (Rohrs)

Pilars of Montessori Method:
Children are capable of self-directed learning.
Teachers are "observer" of the child -Children are masters of their school room environment
Experience
Explore
Analyse
Conceptualization
Reflection
Children learn through discovery, so didactic materials with a control for error are used.

•The hand is intimately connected to the- developing brain in children. Children must actually touch the shapes, let ters, temperatures, etc. They are learning about-not just watch a teacher or TV screen tell them about these discoveries. (Mon tessori)
Applying these methods to a building which serves to educate its users of the building process suggests that a building should allow for discovery through the placement of stimulating tangible objects. Through the way that space is represented a user can learn by observation and detection instead of straight forward representation.

The artifact

"Coming to grips, over the coming decades, with the significant problems facing our environment will require action on many different fronts. Schools have an important role to play in this effort. As places of learning, our schools not only should be green in their construction and operation but should themselves be teaching tools. Many of the features incorporated into green schools - from renewable energy and day lighting systems to storm water infiltration practices- are ideal hands-on laboratories." (Wilson)

"hands-on laboratory" that exploits the architecture and Reveals the Essence of a Place

"There is a multiplicity of ways in which architecture can aid the learning process." Through design one can express an understanding of ventilation, water collection and re-use of water, regional building construction traditions and values. Also through design one can frame nature in ways that are responsible and inspiring. "Rather than being designed to be totally isolated from the ecosystems, the built environment should be designed to integrate and have compatible symbiotic relationships with ecosystems." (Yeang, 61) "Architecture doesn't need to hinder the natural eco system, it can aid in its sustainability and through that process should teach of the interconnectedness between nature and human influence." (Kankainen)Ultimately Architecture should reconnect that circle that has been broken by machines the artifact should be the catalyst between body, mind and nature.

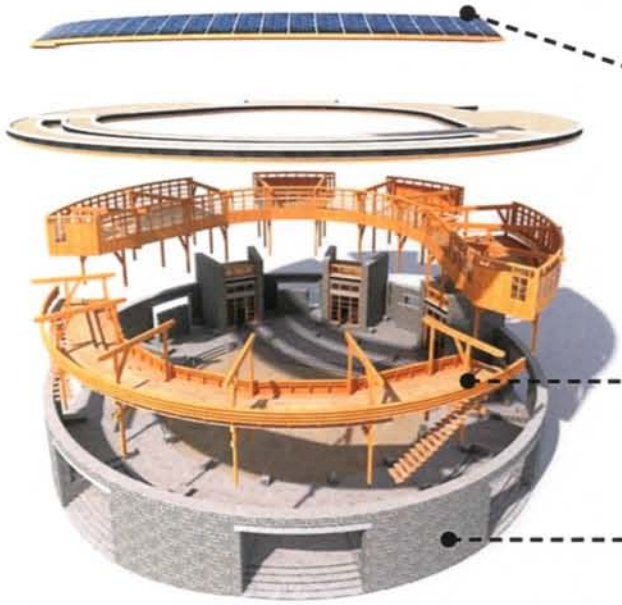
"Sustainable design endeavors to create the healthiest, most nourishing places possible for people without diminishing the ability of nature to provide nourishing places for the rest of creation and for our own species in the future" (Mclennon, 46)

"Nevertheless, the built environment has effects over a specific segment of space and time. By its physical presence, the built environ-

ment, no mater how well designed, will intrude upon, displace spatially, and alter the ecology of the ecosystem on which it is located." (Yeang, 20)

"Sustainability implies long-term viability. As the term sustainable is used today, sustain able developments, culture, lifestylesor whatever, are those that do not overtax the resources and regenerative capacities of the earth, thus leaving for future generations as much of nature's bounty and beauty as we enjoy now." (Buchanan, 11)

Druk white lotus school in Ladakh, India.



On the top: we can see how far they take the idea of the balance between tradition and technology. We can see how the details that hold the photovoltaic panels are local and very expressive
In the bottom: we can see as well the use of local materials and construction methods in a modern language.

In this image comparison we can see the symbolism behind the assembly center by comparing it back to the Buddhist wheel of principles.

In this image comparison we can se the similarities in the tectonics between the Buddhist temple in Ladark.

Druk white lotus school in Ladakh, India.

The Druk white lotus school was designed to teach children to have a balance with modernity. The balance was achieved by using Local construction methods and local materials in a modern architectural language. This school is an example of didactic architecture. Students Druk white lotus school in the can learn about the local culture with the expressive tectonics. The learn about the different materials in their surroundings and how they are put together.

Many parts of the school are designed so that students can learn about sustainability in their desert climate. For example the class rooms have a solar wall that is operable so that student can learn to temper with the environment day or night and winter or summer.
Water is very scarce in this region so the school have a latrine system which is designed to ventilate gases and is compartmentalized so that when one fills with waste there is another one. With this system students learn about decoposition of waste.

One can see an expressed symbolism in the circular assembly center having pavilions symbolizing the don wheel of buda's teaching. This helps young students remember the pillars of their religion.

The special qualities of the class rooms are designed to resmble the spatial qualities of the budist monasteries. One can see the is a cleat intent to in the natural lighting in theboobobbobo windows. The plan configuration is also very similar.

On the top we can see the diagram used to teach the children how to use the solar wall

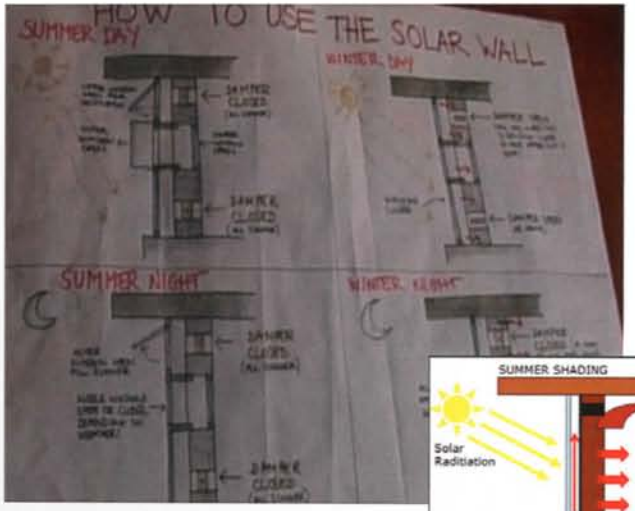
On the bottom: Actual diagram of the solar wall

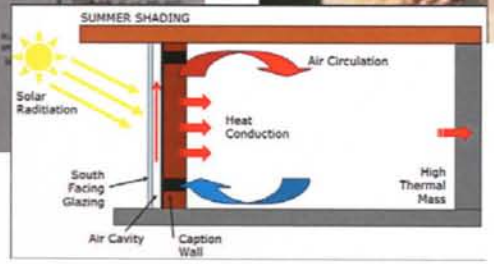
On the top: we see a student using a low flow faucet

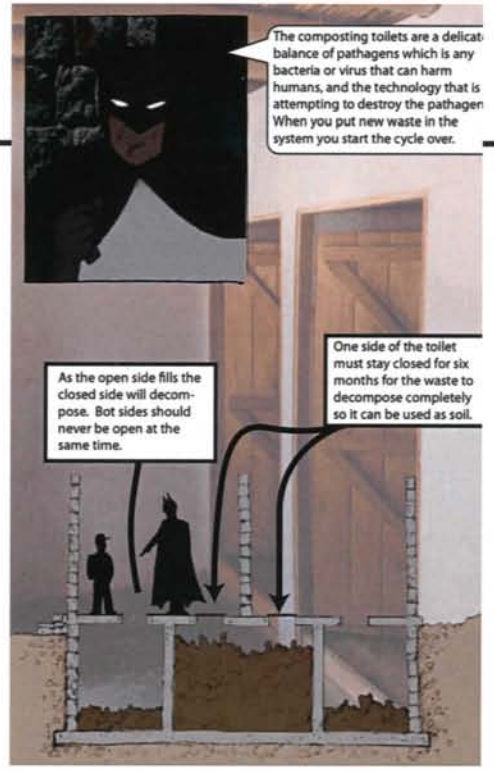
On the RIGHT: we can see an sectional diagram of the latrine design. The latrine has a holding tank that holds the waste while it decomposes, the fumes are taken away by the increasing temperature of the thermal wall.

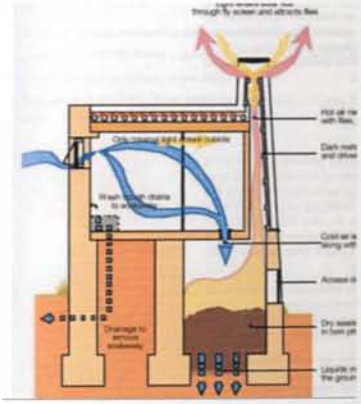
In left : we can see how the school has made ilustrations to atract children to learning about the letrine

All the images used in this section where taken fron a doumentary on CBS and the schools website.

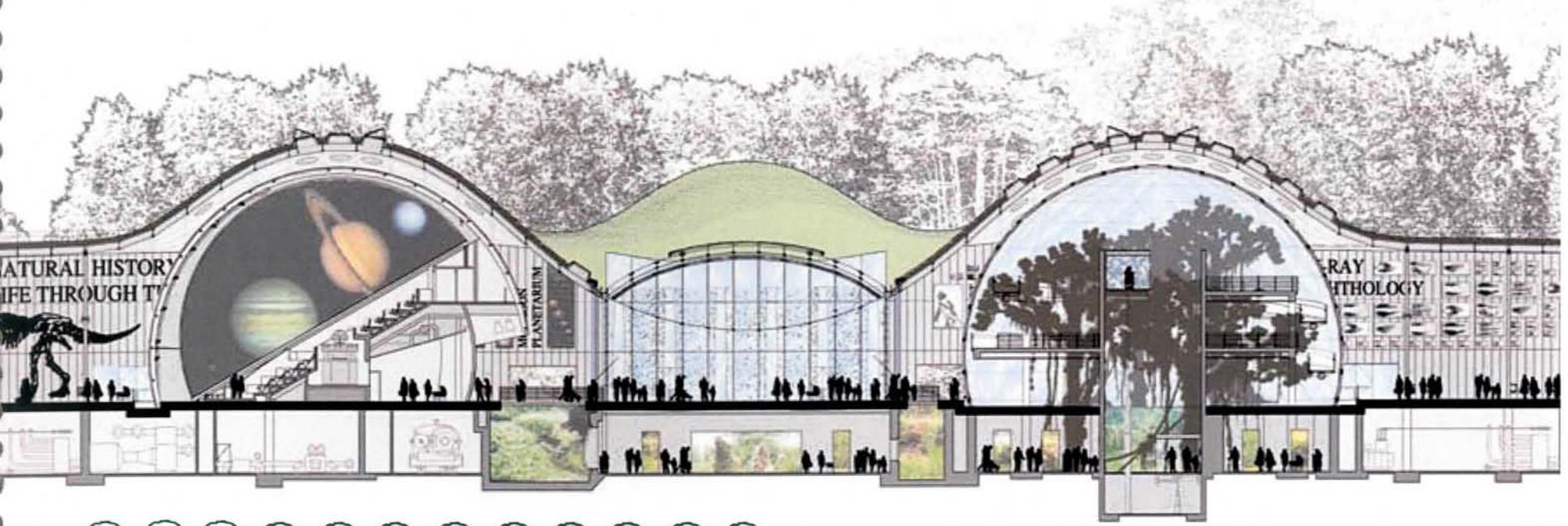


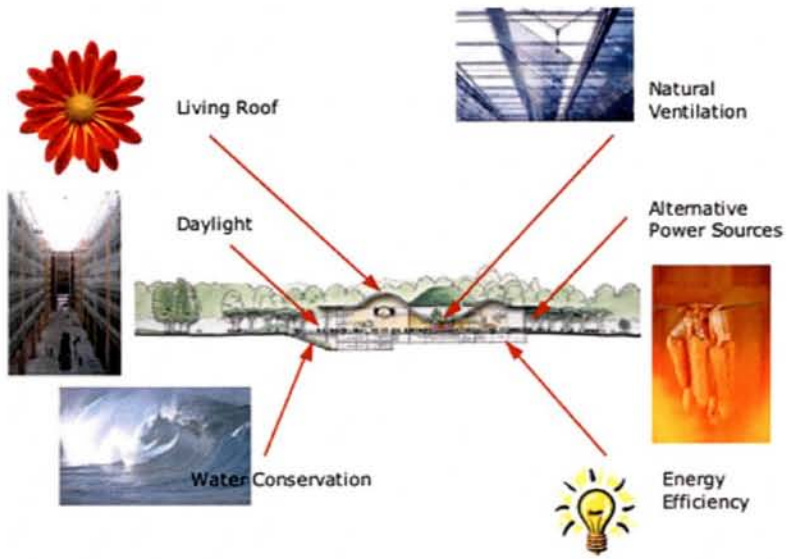


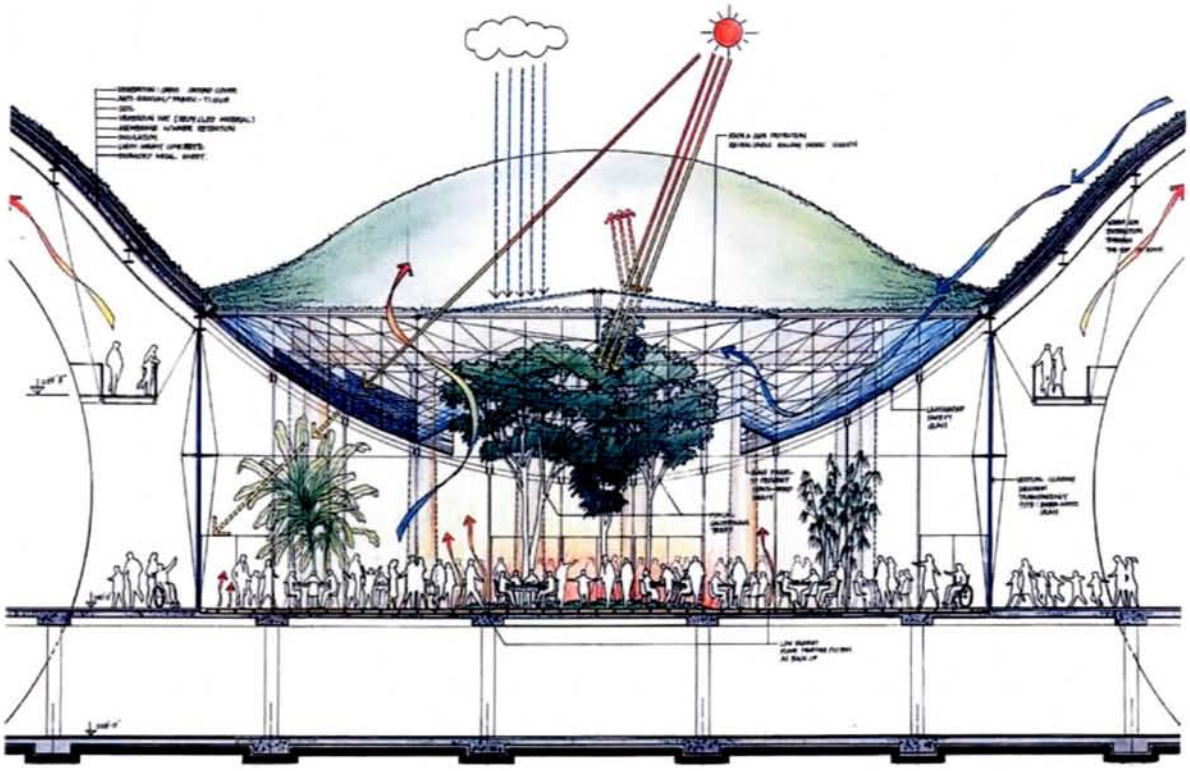




California Academy of Sciences, San francisco, California by Renzo Piano

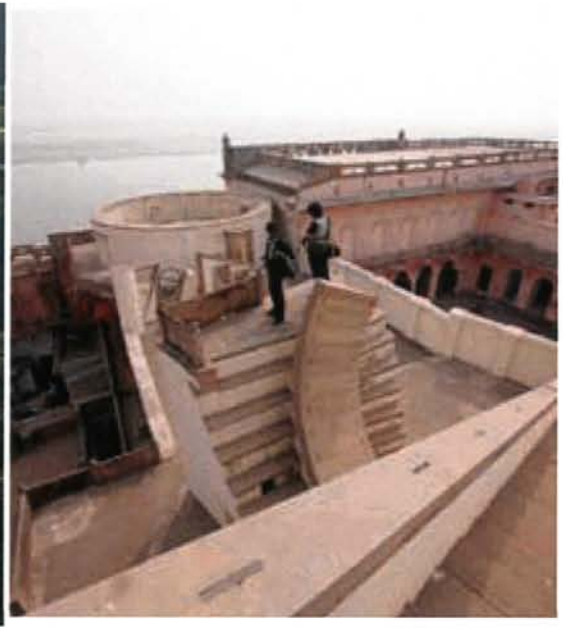


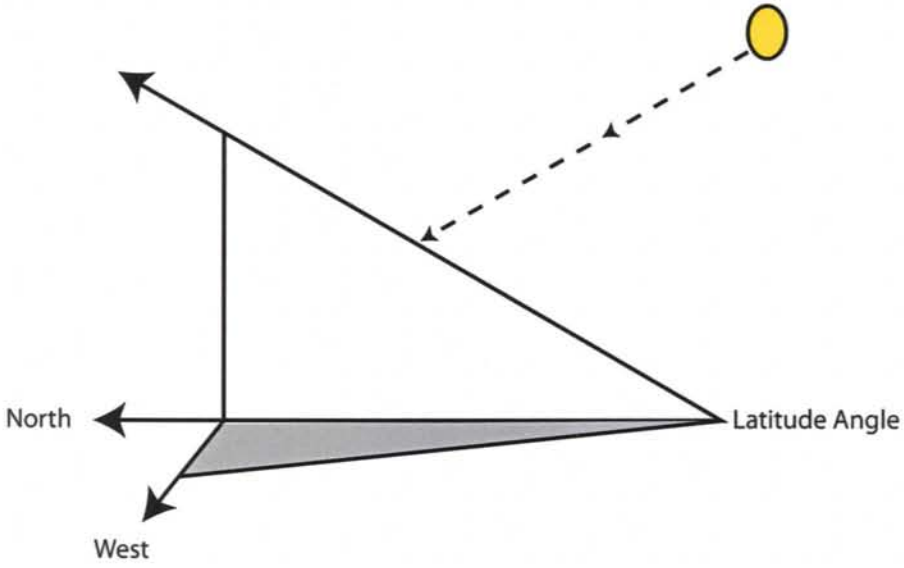




As Piano says: **"The building had to be green and sustainable to go with its purpose—study of the earth and science. It is also in a very unusual place,** the middle of one of the most beautiful parks in the world. You almost never get a chance to build something in the middle of a great park, so it needed to be transparent. You needed to see where you are. Normally, a museum of natural science is created like a theater, so that you can have the exhibits inside. All museums normally are opaque; they are closed, like a kingdom of darkness, and you are trapped inside. **But here you need to know about the connection with nature, so almost anywhere you are in this building you can see through to the outside."**

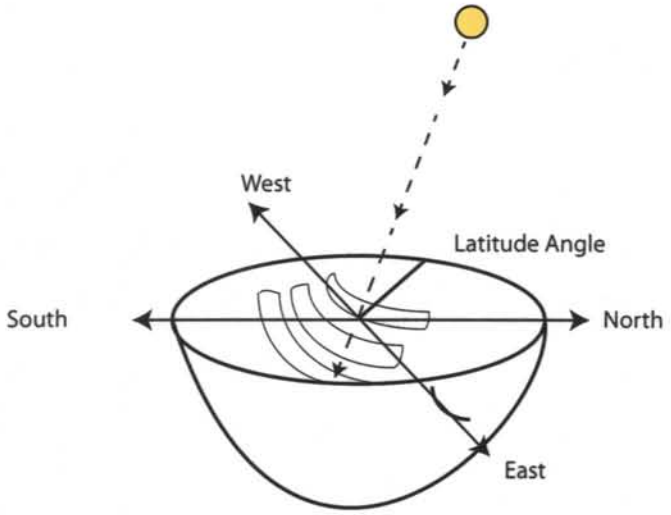
Astrological observatories of Jai Singh II New Delhi, India





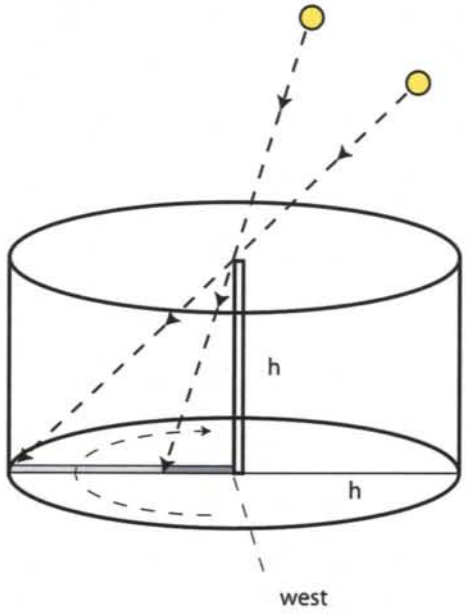
"Architecture in the Service of Science"

World's largest sundial



Hemispherical sundial

Instrument for mesuring time of year aswell as time of day



Insturment to mesure the altitude and azimuth of the celestial objects including the sun.

These places fill our minds with imagination even when we donot fully understand the whole purpose.

Conecting to nature through our Senses

"...Building... gathers the properties of the place and bring them close to man. The basic act of architecture is therefore to understand the vocation of the place. In this way we protect the earth and become ourselves part of a comprehensive totality..." (Holl)

Phenomenology

Phenomenology is a philosophical movement that studies how we perceive phenomena. Phenomena are any observable occurrences; we perceive phenomena through our senses. Architecture theoreticians such aslike Steven Holl and Juhani Pallasmaa and Christian Norgber-Shurz use phenomenology as basis for many theories in architecture. In architecture phenomenology is used to connect our minds with occurrences like light, materials and spatial proportions, so that we are aware of the spaces that surround us.

The senses: our perception of the world

One of the most important philosophers with regards to the perception of phenomenology is Maurice Merleau Ponty. Much of his ideas are the philosophical framework for books such as "Questions of Perception: Architecture of Phenomena" by Steven Holl, and "Eyes of the skin" by Juhani Pallasmaa. This Philosopher believes that " We Only know what we can perceive" (Ponty)and that the"perceived is always the presupposed foundation for all rationality, all value and all existence."(Ponty). For this philosopher "perception is the way we an inhabit space and time". (Ponty).Appearences are the only way we can really get to know things. In conclusion the world becomes what we percive.

Ponty states in his book "Primacy of Perception"theidea of the "body in the center of the experiential world". This idea makes sense since our body is the receptor of all phenomena around it, through the senses, hearing, seeing, touching smelling and tasting. As a result, "Our body is to the world as our heart is to our organism, it keeps the spectacle constantly alive." Without our bodies our brains would be in complete darkness no experiences no perceptions. Logically, if we wish to reach the mind and make it aware of nature the best way would be to target the body. Making the body center should be the goal for the didactic eco Resort. The body's senses should be challenged buy new lessons in the environment making the experience an active one.

Another of Ponty's influential books is the "World of Perception" translated by Oliver Davis. The "world of perception" is composed of a series of lectures by Merlau Ponty himself talking about science, art, space and man. The importance of this book is that it is made in simple prose rather than the writing in "Perception of Phenomenology" and "Primacy of Perception". These lecture where made for a popular crowd for people who had not studied philosophy. Although is very simple in its languages the people say that it has the same depth as merleau other texts.

In this book, there is a very relevant lecture for thesis called "Science in the world of Perception". As we already know, for Merlau Ponty "perception is the base of all rationality" (Ponty). He describes how perceptions shape our relation with world of science.

Ponty describes that when seeing wax we are subconsciously we are thinking of its Properties color, shape, texture, smell, which appeal to our senses in appear. As a result of how we perceive wax, we would not think of the composition of wax in a subconscious manner as we think of its properties, because our senses do not allow us to perceive that.
Another example of phenomena the Merleau emphasizes on is light. He suggests that if we If we want to know light, we should ask a physicist, which would say it is radiation, yet a few hundred years before people would have said it was a stream of burning projectileson the other hand none of these definitions imform us on what it really means for us, for this we need to "consult our senses". When we use or vision we observe how light allows us to distinguish all the differences in color, shapes, movements, and textures of occurrences in the world.

People can say we don't learn through our senses any more, we learn through machines and the scientific method this is why Merleau asks us a rhetorical question: "Why should we look outside of a wall of perception?" and he responds by stating that "As Descartes said 'My senses deceive me' I can 'trust only my intellect'. Merleau points out that many of the mayor advancements in science have been achieved in this way of thinking, because sense can be illusional."

The reality is that we cannot use our senses to quantify data in a precise way or in a uniform way, what science does for us is to provide tools that help our senses to understand or to perceive better what ever is we are trying to study. The basic example of this is the scientific method, which helps us, study the phenomena of the world in measurable terms. Another example where science develops an instrument that helped us to understand better phenomena is the invention of the telescope. The telescope helped us discover that our perception based theory that the sun orbits us and that we are the center of the universe was false and that we orbit the sun. Both theories are base on our ability to perceive but a tool that allows our vision to be clearer aided the second one.

The down side of the development of technologies is that we begin to think through them instead of our senses. As a result our sensibilities for our senses begin to fafed. Juhani Pallasma talks about this idea in his essay of architecture of The seven senses in the holl's book a Phenomenology of Architecture. He tells us how architecture has lost its appeal to the senses. He also tells us that even though or optical nerve is most dominant sense is not necessarily the strongest link or mind. Pallassmaa tells us how acoustic properties can have a deep impact in our connection to a place. Sounds can be perceived not only by our ears but also by our entire nervous system. Pallasmaa also tells us how odor is the most powerful sent in carrying memories from our past. He also talks about how we can get through touch, temperature, texture humidity, and wind much information we can get about what we are feeling. This is why a deep understanding of phenomena and how it relates to us has to be perceived directly through our senses.

Connecting Through Touch

Castel Vecchio in Verona Italy. Carlo Scarpa playing our ability to perceive architecture through touch in the use of materials in the railing.

Some times our perception of phenomena trigger ideas of passive tempering wit the environment as we can see here in this picture with a woman making shade.

we can get so much through touch, temperature, texture humidity, and wind much information

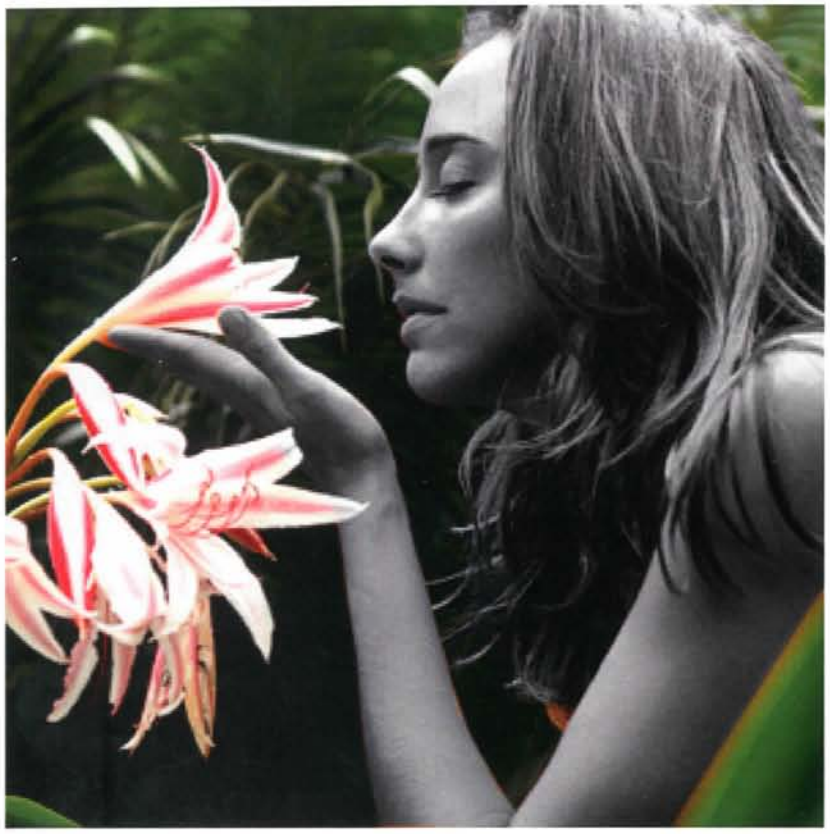
Connecting Through Sound

Collage of our ability to perceive space through sound

Image from Alhambra,Granada Spain our ability to percive the sound of water has the potential to trigger many sensations. for exmple feeling refreshed.

"Pallassmaa tells us how acoustic properties can have a deep impact in our connection to a place. Sounds can be perceived not only by our ears but also by our entire nervous system."

Connecting Through Smell



Foot of wax walls in saint Ignatius chapel connection to the distintive smell of candles in churches

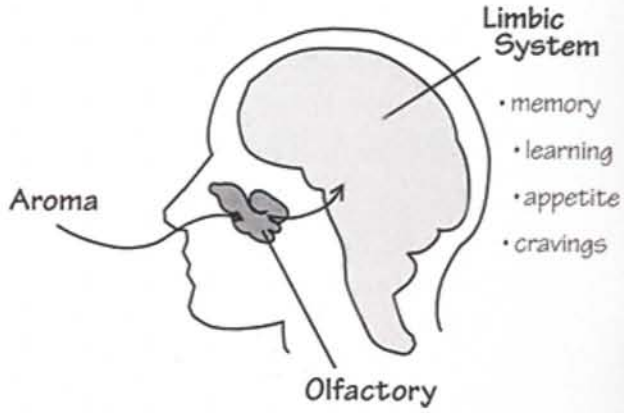


Diagram of the route sense of smell to the brain

Fastest way to connect to the brain

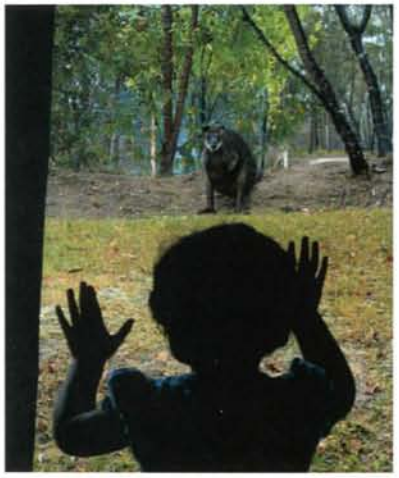
"Pallasmaa also tells us how odor is the most powerful sent in carrying memories from our past."

One of the least developed senses

Connecting Through Taste

Naranjos in Seville, Spain example of a multisensorial connection to nature in side city walls.

Connecting Through Sight



Source of images: getty images.com

Phenomenology in Nature

Architect historian and theoretician Christian Nordberg-Schulz tells us in his book on phenomenology that "our understanding of the natural environment grows from our primeval experience with nature". (Nordberg) He states that "the meaning nature is going to have is directly related to the relationship we have to nature." (Nordberg). "Through his understanding the only way we make friendship with nature is to understand our relationships with nature phenomena." This means that we understand the fact that we are surrounded by: seas, mountains, trees, weather and that we have no direct control over nature. Our awareness of nature's phenomena is very important because If we live in a city and we do not learn about our relationship with natures phenomena we would continue to see nature as a resource that can be exploited rather than a resource that should be respected.

For Nordberg - Shurz all occurrences of nature combine into the spirit of the place or as he calls the "Genius Loci". As every place on earth has it own unique combination of phenomena every place has its own spirit. For example the genius loci of a rain forest in Brazil would never be the same than a desert in Arizona. The ways vegetation combine with landscape, the type of landscape, the humidity and the light all give us a sense of presence and a sense of connection with nature. When we travel we want to be able to be exposed as much as possible to the spirit of the place so that we learn to value and appreciate that genius loci.

"...Building... gathers the properties of the place and bring them close to man. The basic act of architecture is therefore to understand the vocation of the place. In this way we protect the earth and become ourselves part of a comprehensive totality..." (Holl)

Phenomenology in Architecture

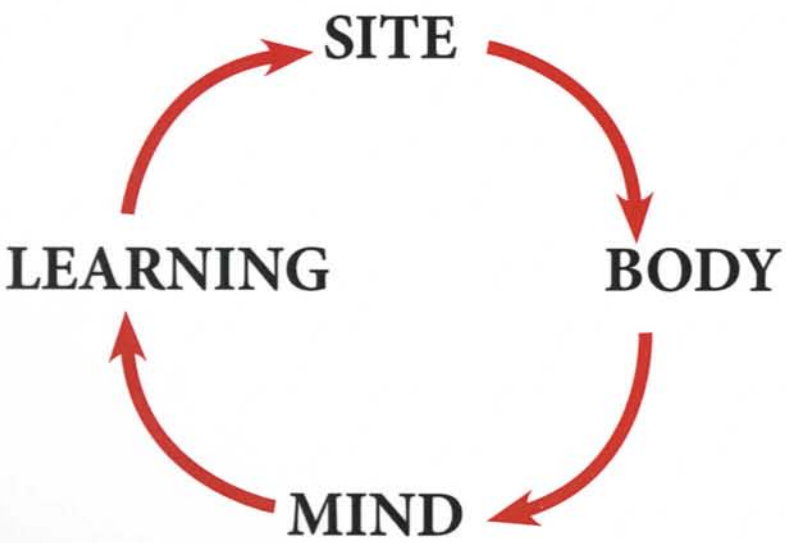
In a thesis on phenomenology in architecture, Yorganciolgu talks about what phenomenology means for architecture: "For the architect, a phenomenal field is presented through the physicality of the built form. In this phenomenal field there exist visual, tactile, aural qualities, even sense of odor. The use of material, the design of details, color, light and shadow effects establish a phenomenal realm, which is distinctive to architecture." (Yorganciolgu p 48)

A recent example of the use of phenomenology is the Lousium hotel in Austria. This hotel is made to convey the phenomena behind the process of making wine. The hotel has a sequence that takes us through the process of making wine emphasizing on the occurrences of light, water, earth and the growth of vegetation.

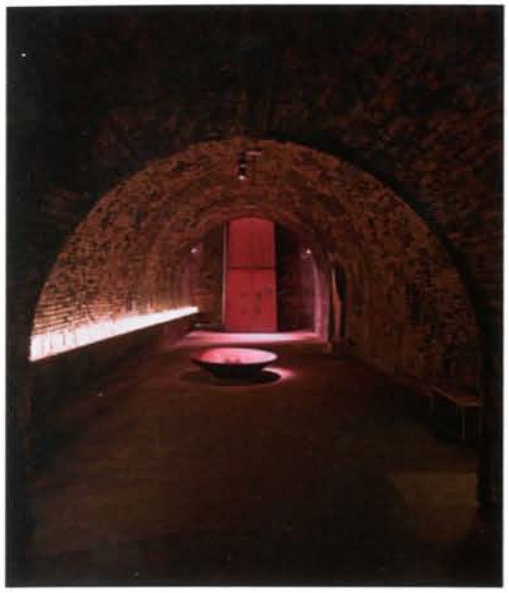
A compelling use of the phenomena of light is the work of artist James Turrel. He concentrates on how light and the sky can give us a connection to the cosmos, though the use of sculptural skylight that heighten our reading of the sky. People are so mesmerized to when the start to feel this awareness of the cosmos it makes them forget everything else.
Relating more to this thesis is the Alila Villas project in Bali. It is very impressive how the architects make this connection to nature and the absolute of the horizon very apparent the tectonics and materiality of the terraces.

Steven Holl provides in his book a good description of the use of phenomena "At Louis Kahn's Salk Institute, there is a time day when the sun, reflecting on the ocean, merges with light reflecting on the rivulet of water in the trough bisecting the central court. Ocean and courtyard are fused by the phenomenon of sunlight reflecting on water. Architecture and nature are joined in a metaphysics of place."Through this description Holl shows us how building, site, and nature can be unified as one. Yet orientation is not the only ways as to achieve this link. Materials, and the relationship between the use of light are what call the attention to the inhabitant. In this case the water is used as the linking agent between the site an building.

"At Louis Kahn's Salk Institute, there is a time day when the sun, reflecting on the ocean, merges with light reflecting on the rivulet of water in the trough bisecting the central court. Ocean and courtyard are fused by the phenomenon of sunlight reflecting on water. Architecture and nature are joined in a metaphysics of place."

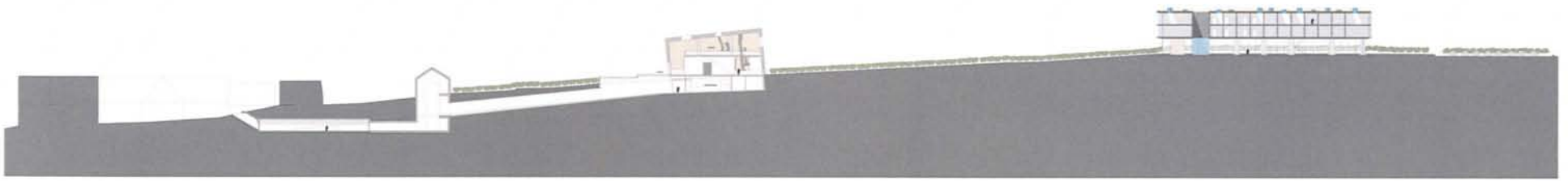


Loisium Resort Austria Steven Holl



" light is one of the most important elements in the sustainability movent because so much can be aributed to it light...energy... plant... growth I t should have ceter stage in the experience. Also light as seen though these proyects is a temporal, this can also have an effect on the perception of the guest. At different times ather are different lessons." Steven holl

Earthlike materials and palette combined with the views of the surrounding landscape create a strong connection and relationship of the hotel to its context.

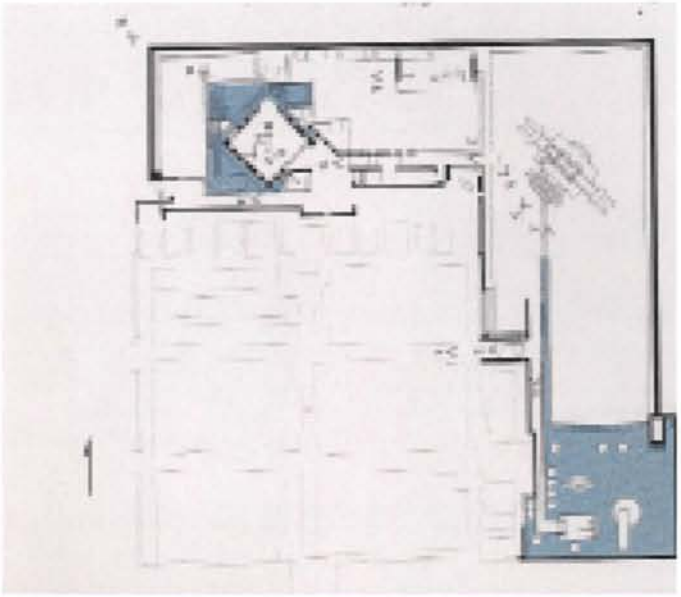


Roden Crater, James Turrel

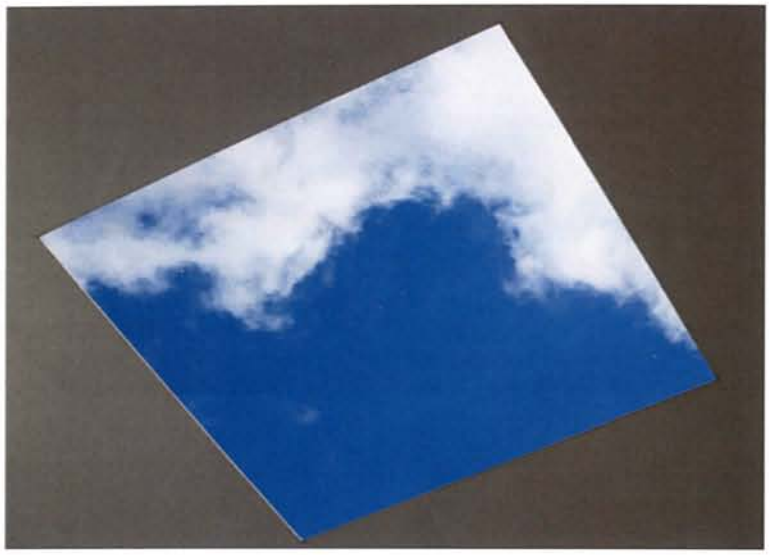
Section of Roden Crater

A compelling use of the phenomena of light is the work of artist James Turrel. He concentrates on how light and the sky can give us a connection to the cosmos, though the use of sculptural skylight that heighten our reading of the sky. People are so mesmerized to when the start to feel this awareness of the cosmos it makes them forget everything else.

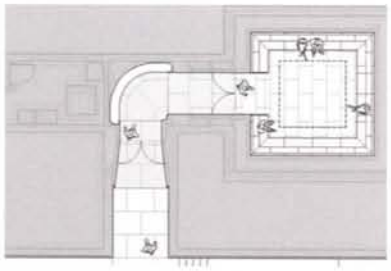
Cementery, Carlo Sarpa San Vito d'Altivole



Nasher Sculpture Center, Dallas, TX James Turrel



Vestibule
"In these, the light takes on a physical presence, seeming to define a solid form (here, the curved wall of the vestibule) where there is only empty space."



Skyspace
"The skyspace provides a quiet, meditative setting in which one concentrates on the view of the sky through a 9 ½ x 9 ½ ft. opening in the ceiling. The rim of the aperture is knife-edge thin, which helps heighten the perception of the sky's proximity. It often appears that the sky has been drawn like a sheet tightly across the opening."

http://www.nashersculpturecenter.org/James/Turrell/Skyspace

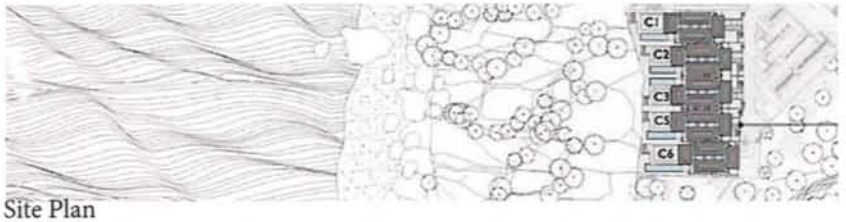
Alila Villas, Bali Indonesia, Architects WOHA

Interior Veiw of SkyLight

deatail of skin and structure

veiw of exterior

view of roofs



Site Plan

Plan of Villa

Sources: http://www.alilavillasuluwatu.com/cliff-side-villa, archdaily.com

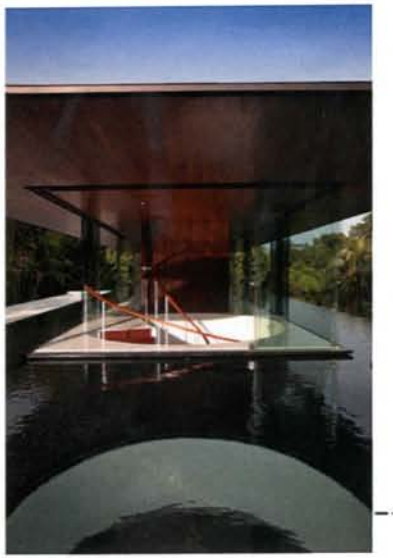
These terraces give the perception that one is inside the vegetation and that light is passing through the branches. Making this feeling even more clear is the wood texture that relates back to the vegetation round it. Also one can see how the lattice configuration is arranged in a way that highlights the horizon light so that one can ge this feeling of the "absolute" that the water gives in the horizon.

"The design investigates the potential of the fusion of vernacular architecture with modernist design. The design combines the delights of traditional Balinese pavilion architecture and rural landscapes with modern dynamic treatment of space and form. The design is based from first principles around the pleasures inhabiting the particular site, rather than assembling stereotypical images of Bali or generic resorts."

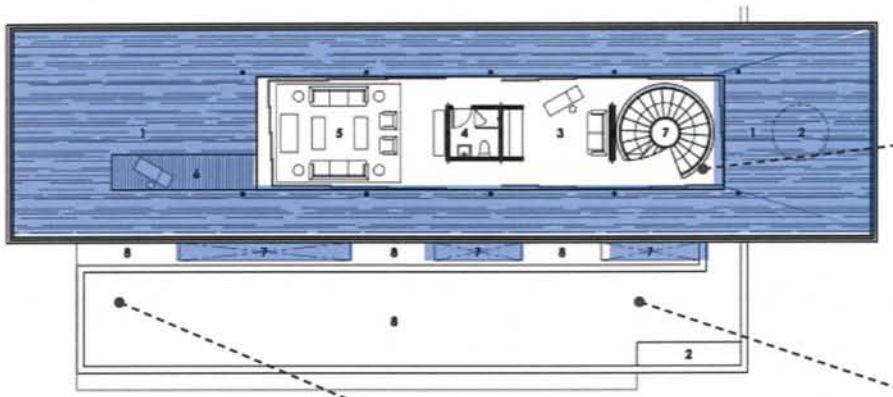
"The development has been designed from the start to exceed Green Globe 21 requirements."

"The development is gentle, embracing the landscape. It is located in an impoverished, dry, rural area, so replacing marginal agriculture with tourism that generates substantial employment and income for local people. It maintains local flora and fauna. Through showcasing local skills, materials and vernacular elements, it confirms the local people's opinion that they live in a marvelous place that should be cherished and maintained."

Water-Cooled House, Wallflower Architecture



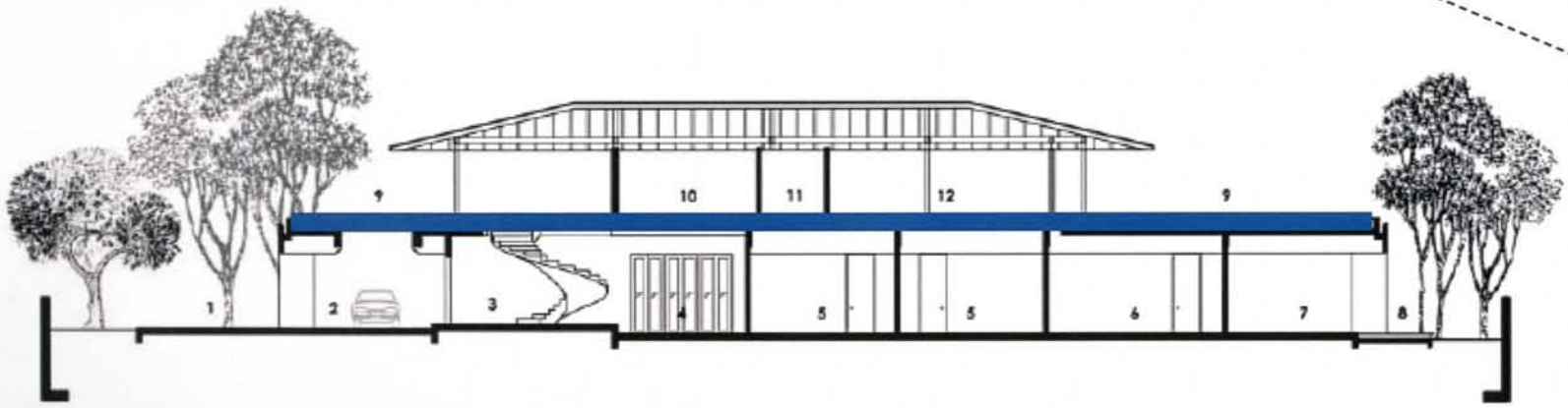
water level veiw of skylight



veiw of skylight fom above water level

Sky lights in the hall way Relating to Interior Pools

Skylights have a dialogue with water features. The relation between phenomena is one the things that really defines and sets apart the spirit of a Place.



Sky lights Relatingto bathrooms

Cranbrook Institute of Science (story of water) Steven holl

On the top images fom the light laboratory in the entrence
On the bottom images, form the house of vapor house of ice and Pools.

diagram in blue of pavilions of the story of water. and how the make a squence from the entry.

Steven Holl, constructed meaning of water in the Canbrook Institute of science through the use of 3 pavilions and the use of a threshold. "The new Institute is centered around an inner garden where scientific phenomena are exhibited in the open air. Within this "Science Garden" is the Story of Water; water in liquid, solid and vapor is featured in flow pools, a "House of Ice," and a "House of Vapor." A "light laboratory" forms an entrance hall which functions as a changing exhibit. The "Story of Water" garden is divided into pavilions of liquid, solid and vapor. Space "can become profound when experienced through synthesized consciousness" (Steven Holl) "One should not seek behind the phenomena, they are the lessons themselves." (Goethe)

Architecture of an Eco-resort

When people go on vacation they want connect to that place they appreciate so much, that they are willing to leave their homes for. The eco resort should be an artifact that fosters the connection of tourists to the Genius loci of that enviorement. This artifact should develop the connection to all the phenomena in the surroundings in as much of a multisensory experience as possible.

As we can learn from Merleau, The problem with people today is that we have forgotten to use our senses. We have forgotten that our senses are the channels through which we connect to the world and not the tools science has provided us. The eco resort should be an artifact that develops of our ability to connect to nature without the use of technology. In other words a tool which teaches us that we need no tools to connect to nature.

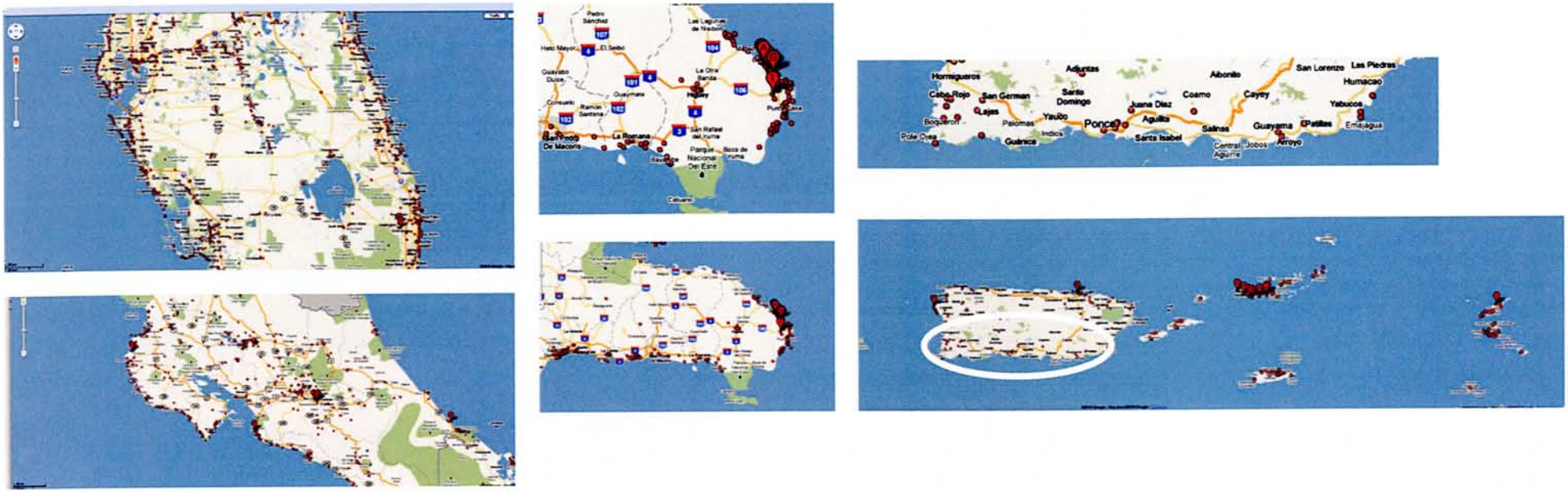
This artifact should be seen as a didactic artifact that makes us hyperaware of the occurrences in the environment through our sense. They're for making us very aware of our relation to nature. In the perspective of the guests, this is what they are looking for. Guests go to these retreats to reconnect with nature. Guests don't go on vacations to nature reserves to learn thought-quantified data the go to breath, touch, and smell and taste nature. In this sense making the approaches to the senses and relating them to nature's phenomena is very important. One could even say that the learning would be done almost automatically.

People could say that learning form our senses about phenomena could be misinterpreted. Yet as Goethe said, "One should not seek behind the phenomena, they are the lessons themselves. That these lessons are not complicated, they are as a basic and elemental as possible yet the have a very profound meaning. They are the basic question Christian Nordberg-Shurz talks about. How one sees himself in relation to nature. And as I have learned form Merleau this comes through our senses. As I have mentioned in before in previous chapters, this is the way that before we all knew how to read and write, we learned about the world we live in. Teachers in preschool and elementary school use perceptions to teach their students.

As a result from the artifact making us internalize nature's phenomena as if it was poetry. This artifact should make us take a second look at the things that we take so much for granted. The eco resorts invites us to meditate on: what is our relation to the world's phenomena and how are part of a comprehensive totality.

Thesis Laboratory: Island of Caja de Muertos (box of the dead)

Analysis of Tropical Climate Hotel Densities in the Americas



Mapping execise using google maps seaching hotel in the them most popular tropical destinations. In the top left we can se florida where we can see a higher density of hotels per area. In the left down is the map of costa rica famous destination of ecotouristic hotels. in the right we have the dominican republic Ruerto Rico and Saint Thomas. we can see that siant thomas is filled with hotels. we can also see ther are not os many hotels in the south of PuertoRico.

To get an idea of where the majority of hotels are located I used the google map search to pin point all the hotels in famous hotel destinations. Maps that I used for this exercise where the same scale and where part of the same search. It was not a surprise to se that Florida, the Dominican republic, bahamas, PuertoRico and especially where covered with dots of hotel locations. And if one looks at the names of these hotels most of them are represented by big chain hotel labels like Hitlon, Marriot and Gran Melia.
Its interesting to see also where are the pockets where the are no hotels. Looking closer I realized that the pockets are either nature reserve or no very accessible to tourism. Differing from that paterns of pockets,one of the significant pockets in the south of Puerto Rico where the are few nature reserves and it is very accessible to tourism.

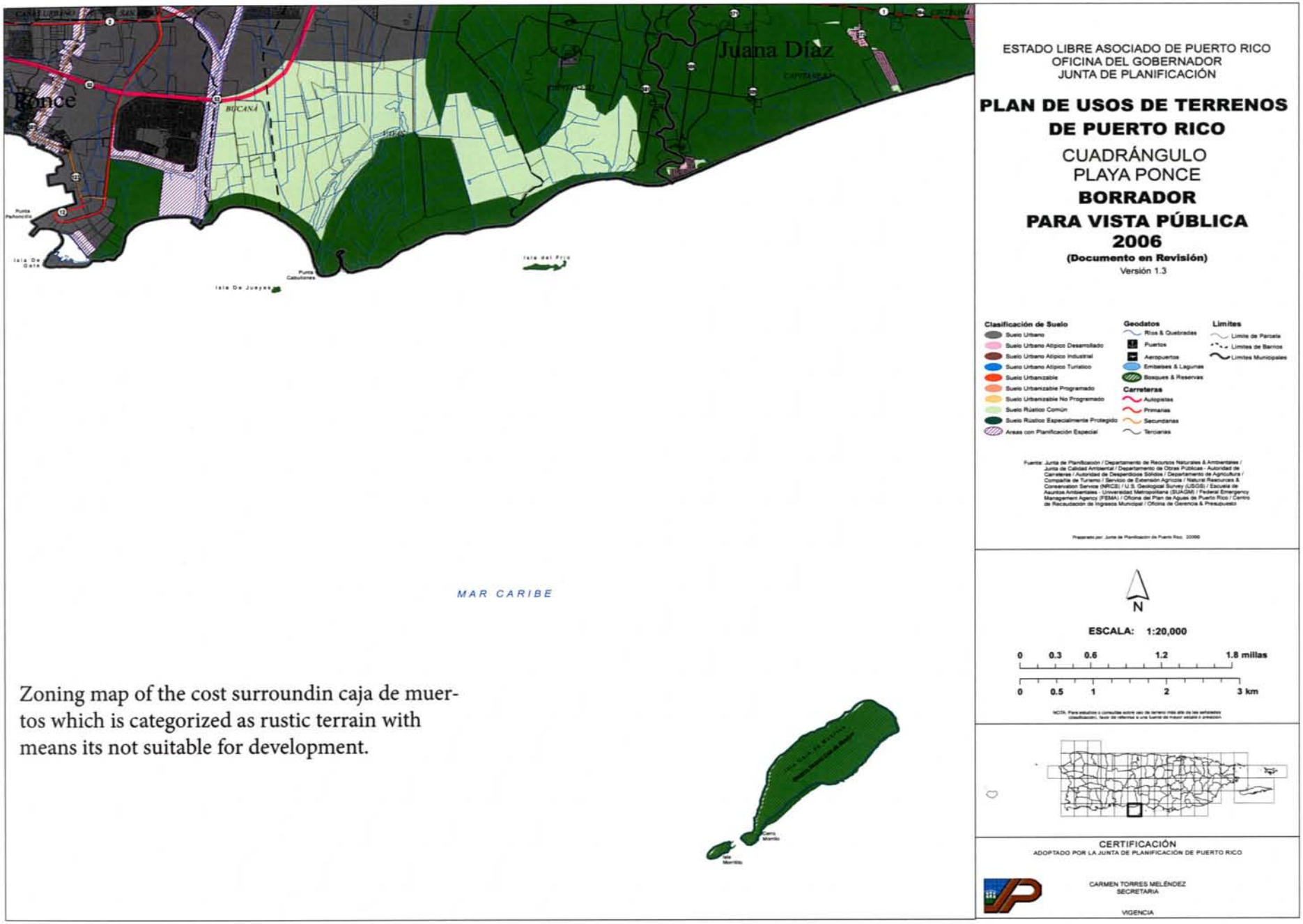
Analysis of Costal Lines

This diagram illustrates the contrast in predominant geological conditions in the north where the beaches are predominantly light almost crystal waters white sand beaches and in the south where the water is dark and the sand is brown. thes images where taken from goolge earth.

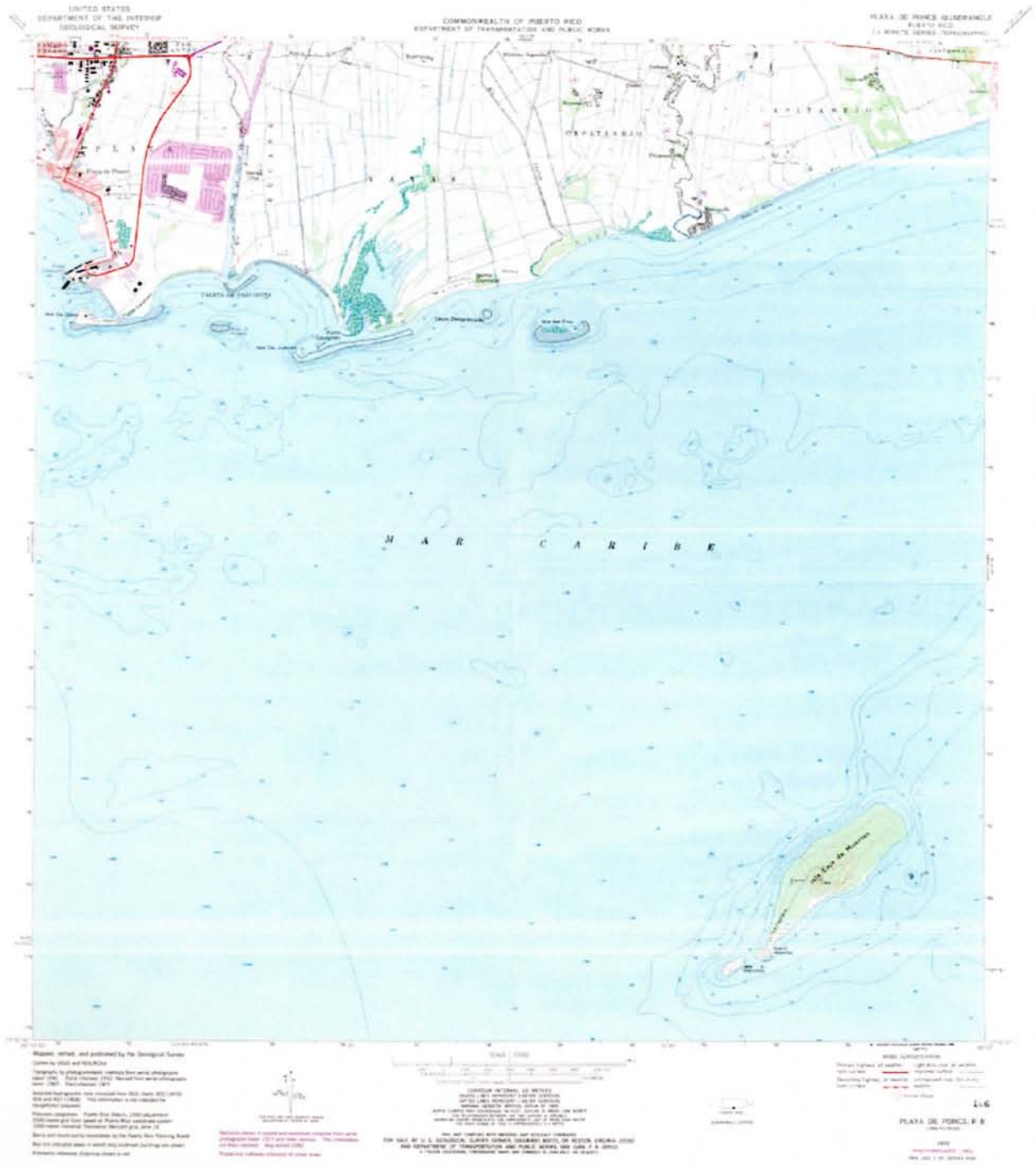
The answer to way the south is not so developed in terms of tourism is that the beaches in the south are not so appealing for tourists. These beaches do not have the white sand and crystalline waters tourists look for. The sand is dark, the water is not clear, and mangrove swamps cover most of them. Simply by comparing Google images of the north and south beaches one can see the difference in the beaches in the north and the south.

Throught this analysis I also saw why the famous island of Caja de Muertos is so popular to locals in the south of Puerto Rico. This is land is a precious resource for the south region.

We can also see this idea in the Zoning map of the cost surrounding Caja de Muertos which is categorized as rustic terrain with means its not suitable for development.



Zoning map of the cost surroundin caja de muertos which is categorized as rustic terrain with means its not suitable for development.



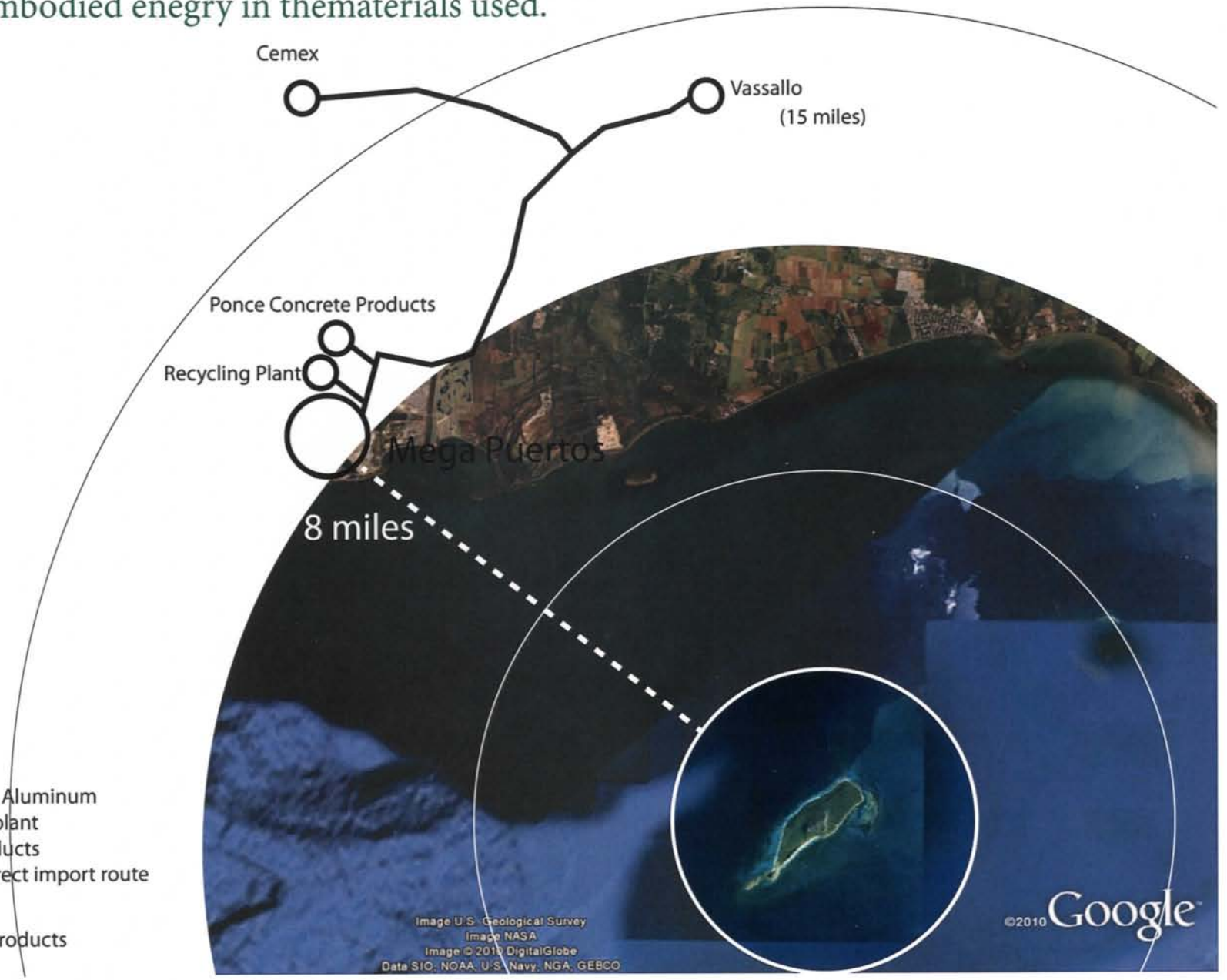
US geological survey Map

Geographic Location

Potential Attractive Locations for in the Region

Basic Material Production Location

Minimizing the embodied enegry in thematerials used.



Recycling Plant - Aluminum
Cemex - cement plant
Vasallo - Pvc Products
Mega Puertos- direct import route from Panama.

Ponce Concrete Products

Island of Caja de Muertos (box of the dead)

google earth image of the Island

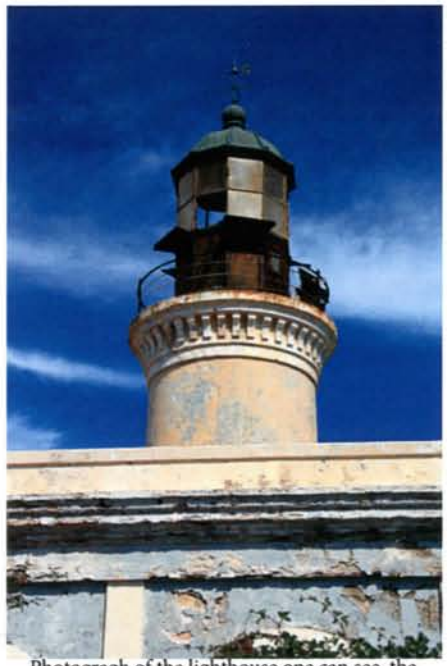
Thesis Laboratory Caja de Muertos

Through the analysis in the previous chapter I was intrigued by the condition of an island in a region in the Caribbean that has not been affected by mass tourism. The absence on mass tourism and the unique geographical properties makes the island a good laboratory for this thesis. "Caja de Muertos" or Coffin Island, with its unique crystalline waters and white sand beaches this island shines it in the south region of Puerto Rico. Caja de Muertos has the potential for many types of tourism. For those interested in history; by hiking to the highest point they can find the lighthouse 1 of 5 commissioned by the queen of Spain in the 19th century. Also by hiking one can also find a complex of cave, which is good for some types of adventure ecotourism like sip lining of rappelling. On the south part of the island one can find a nature reserve for sea turtles to come and nest their eggs in this beach. On the southeast side of the island lays a large very important coral reef which is famous to local divers and Snorkelers. The north side is famous for its calms waters perfect for beachgoers.

The island earns the name "Coffin Island because of its distinctive topography in shape of a casket driven into the ground. The shape of the island is very dramatic because from the main land of Puerto Rico the only thing can see is how the topography brakes the horizon line made by the Caribbean sea. The island has many tales of being the hideout of pirates and their treasures. One legend suggests that

View from the island to the noth. One can typically see boats visiting the isalnd on the week-ends.

veiw from shore towards Ruerto Rico.



Photogragh of the lighthouse one can see the poor conditions this monument to the south of region of Puerto Rico be couse of the poor interest in the island.

it was the burial site of the wife of a famous pirate. Out of this idea for a eco resort in this location one could say that the seed for a new type of ecotourism lays in coffin island.

In 1992 the island was developed as a site for ecotourism by making trails throught which tourists can access the island features but it never gained popularity because of its lack of amenities for tourists. The problem of attendance was so bad to the island the in 1994 the ferry was de stopped because it was not viable any more. Although the public ferry lacked attendance, the beaches have always been a weekend favorite for the bourgeoisie of the south region in the main island. It's not unusual to see the north side of the island filled with boats and people. These people have a passive to exploitative tourism approach to the island they do not contribute to the maintenance or the effort to conserve the island. Recently the local newspapers have written about the poor maintenance of the facilities and need for waste management.

An eco-resort in this island would help create an economy that balances the stress put on the environment. This economy would take

"Deserted does not mean empty"

Turtle Nesting Site

Most Popular beaches

Light house

Caves

Reef

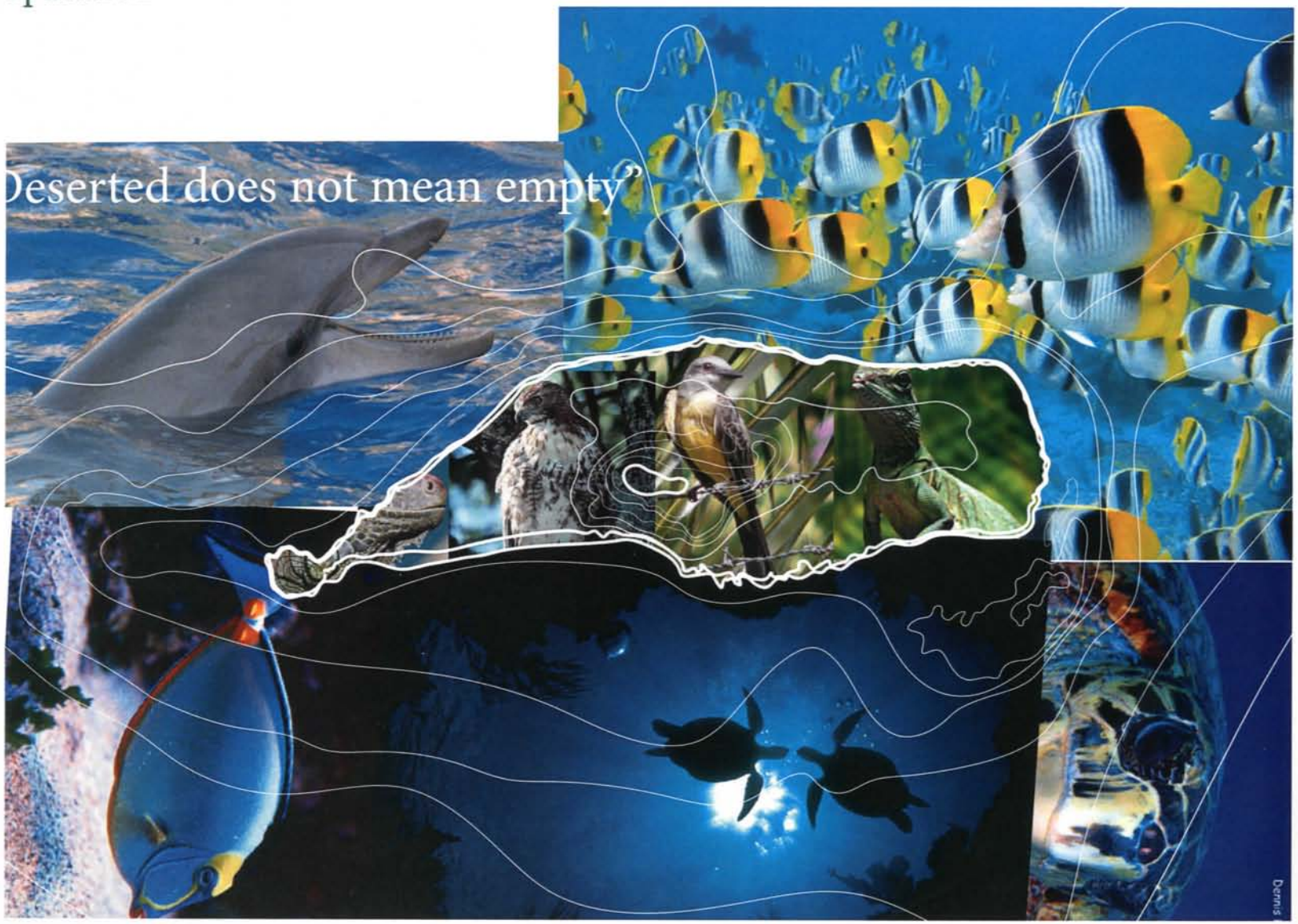
Catus trees tower the landscape in caja de muertos reaching hights of 15 to 20 feet.

Ilustration of how people enjoy thes island.

one of the many variety of flowers in the island

care of the waste management problems in two ways creating a more frequent route of transit between the main land and the island and creating gray water treatment facility. Also the island only has one person in charge of the island conservation and preservation by placing an eco resort in the island the island would have some extra pair of eyes with the commitment to protect the island.
The island being a nature reserve has many special features the need to be protected. Especially in the flora and fauna. Because of the hot and dry climatic region, The Island has vegetation of a tropical dry forest. Although the soil composition in the island is volcanic, sedimentary and non-consolidated sand with gravel components with temperatures from 23 Celsius to 27 C which is not the best for plant life. Surprisingly, The Island has 172 species of flowers. On the south side of the island one can some mangroves. The island is filled with small trees and shrubs. The most impressive in terms of vegetation are the large cactus trees can be found in the Island across the island. One can also find a place where there is a small swamp because the ground is barely below sea level, and when it rains it fills up or when the water level raises it connects to the sea.

Island Population



In this picture a freindly face that comes to greet visitors when they aproach the island by boat.

In this picture we can see the Carey turtle ins an endangered species that comes to to the island to hatch its eggs. To protect this species habited the island is constantly surveyed to ensure that their habitat is not being affected in any way and to make sure that the population is growing.

Sea rays are always visible in the bottom of the crystalline waters

The island wildlife is very diverse. The island has 9 species of echinoderms with include varieties of starfish; 210 arthopods; 76 species mollusks; 73 species fishes; there are 14 species of reptiles and 6 species of mammals in the island. The island is home two 2 endangered species. These species are very close to the hearts of the Puerto Ricans. One is the manatee, which can be, fund munching thought the mangroves. The second is the Carey sea turtle, which comes and nests its eggs in the south side of the island. This is particularly special because there are not a lot of places in the island where this happens and particularly where this can be seen without really disturbing the environment. Its not rare to find dolphins jumping in the never by waters.

Adding validity to this place as laboratory is the fact that just this past week the senate of Puerto Rico issued a project to amend the law of tourism in Porto Rico, with the intent to make a new committee to work in stimulating and overseeing the ecotourism development of the south of PR. Due to the economic crisis the senate is looking for ways to improve the local economy in the short and long run. Ecotourism as an investment is a good idea because as we all ready know ecotourism is a viable way in which one can harness nature For the senate of Puerto Rico amendment and for this thesis; this is a strategic moment for the south of Puerto Rico. A mega port is about to open in the most important city , Ponce. Logically, for an island, even Puerto Rico; ports are the only way the vast majority of food consumer products are shipped. This new port makes the first direct connection from island to Panama. Making Ponce and the south region of the main land a place of strong economic in interest. Where there is economic interest one can assume leisure will shortly fallow.
It may seem that I have a strong conviction with this site, but have looked for other places but have not found another location with as many attractive programs to guests and as much validity in current events as this one. By using Caja de Muertos as a laboratory I not only have a unique place to work, a place that enjoys more geographical resources, but provide answers to architectural questions that will be asked in the near future of Puerto Rico.


Ponce, Puerto Rico
Int Airport
Mega Port
Caja de Muertos
Google
©2010 Google
Geological Survey
NASA
DigitalGlobe
U.S. Navy, NGA, GEBCO


10
50
10
Image U.S. Geological Survey
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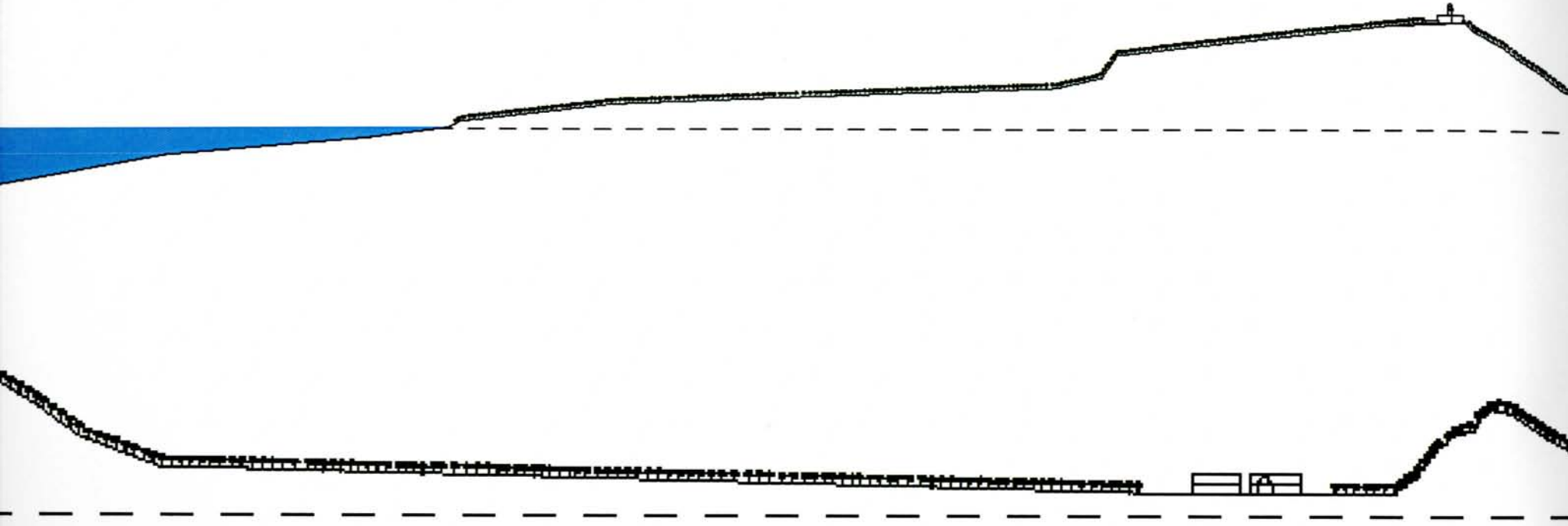

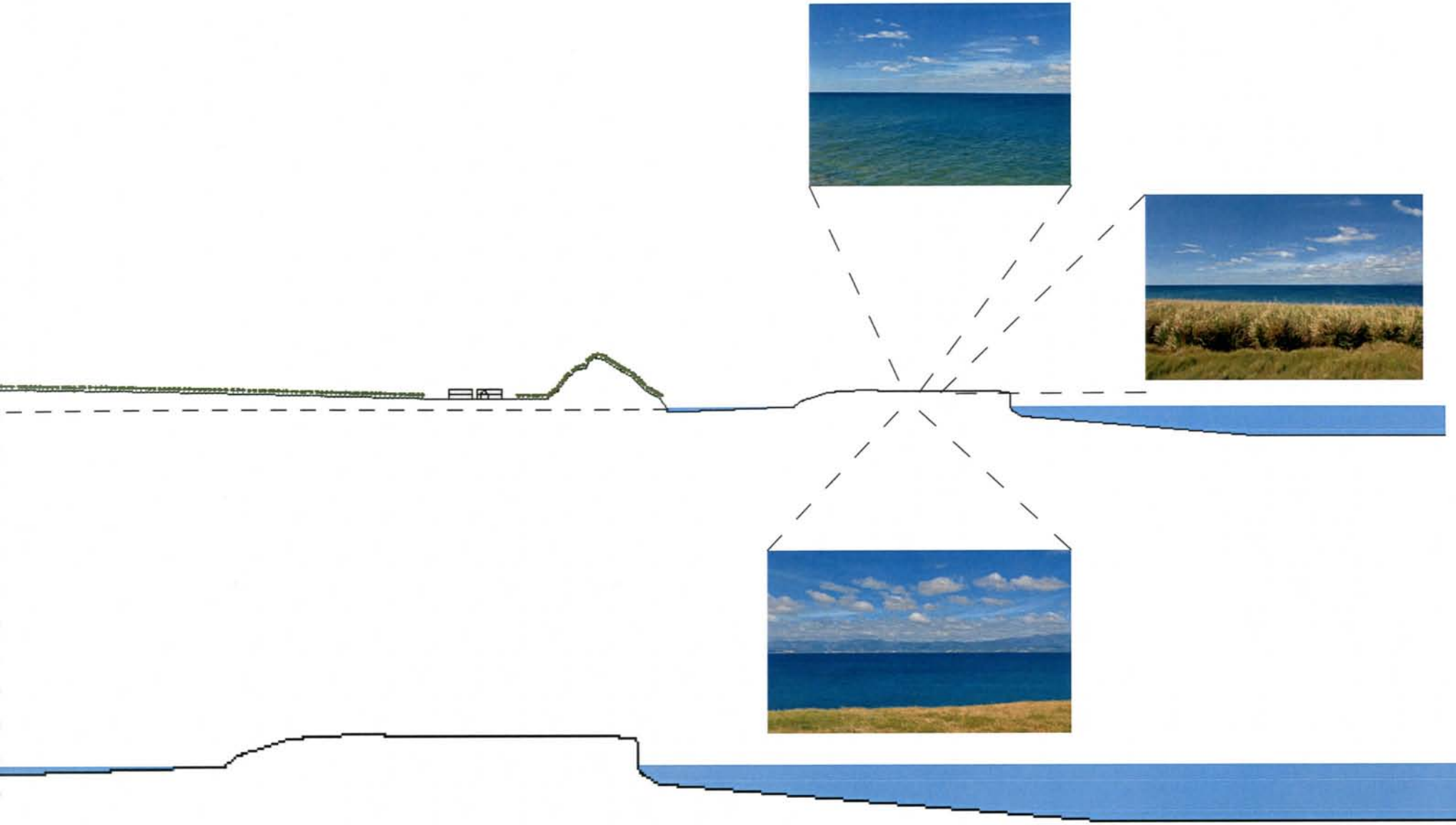

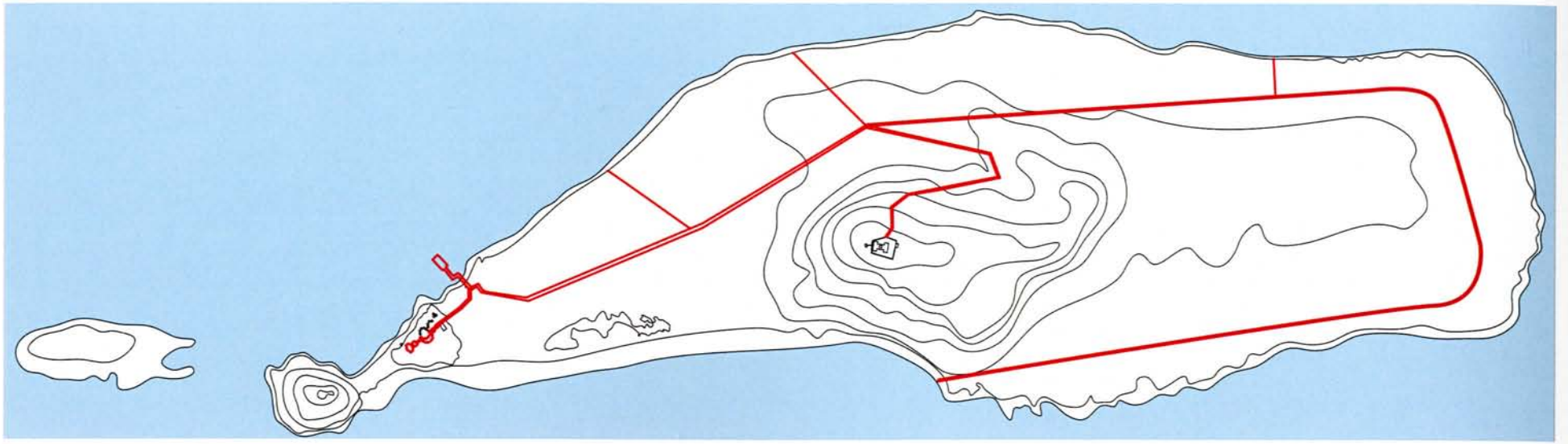

Trails in the island

Location deparment of natural resources camp and lighthouse


Stereographic Diagram
Location: 17.5°, 116.0°
Sun Position: -67.2°, 3.2°
HSA: -67.2°
VSA: 8.1°
N
15°
30°
45°
60°
75°
90°
105°
120°
135°
150°
165°
180°
195°
210°
225°
240°
255°
270°
285°
300°
315°
330°
345°
10°
20°
30°
40°
50°
60°
70°
80°
1st Jun
1st May
1st Apr
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1st Nov
1st Oct
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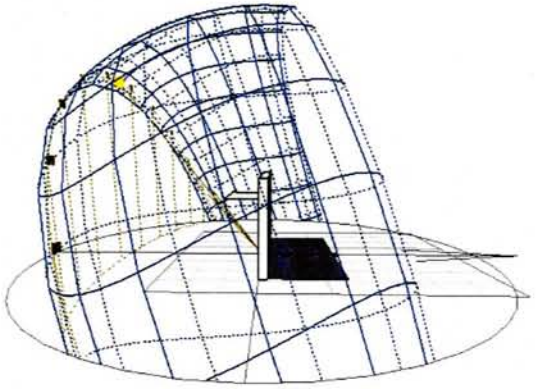
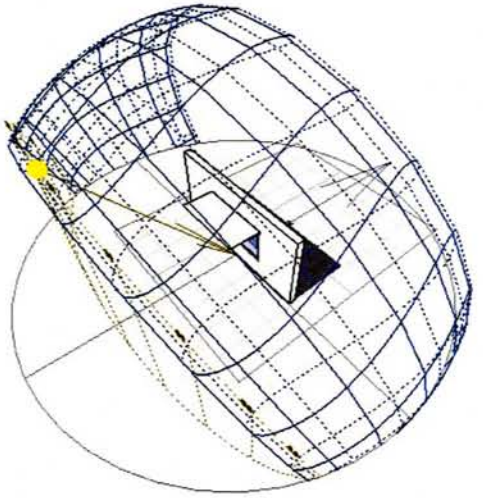
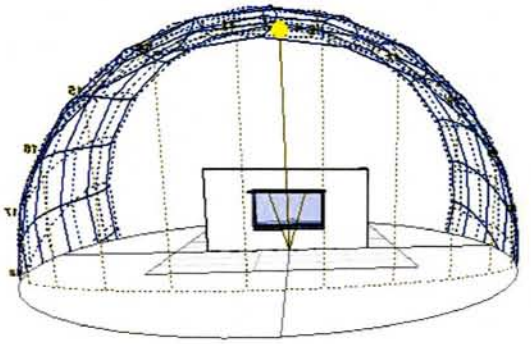
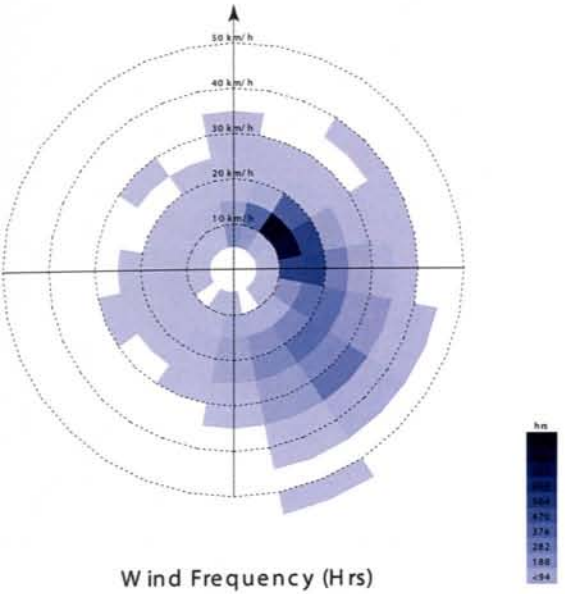
Image U.S. Geological Survey
©2010



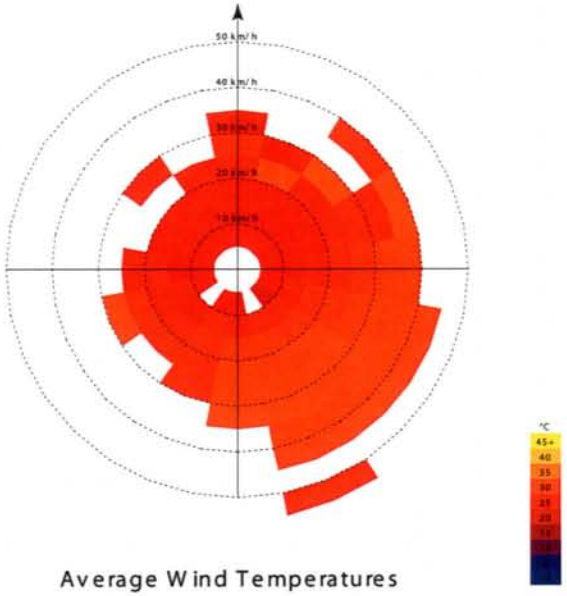




Weather Conditions



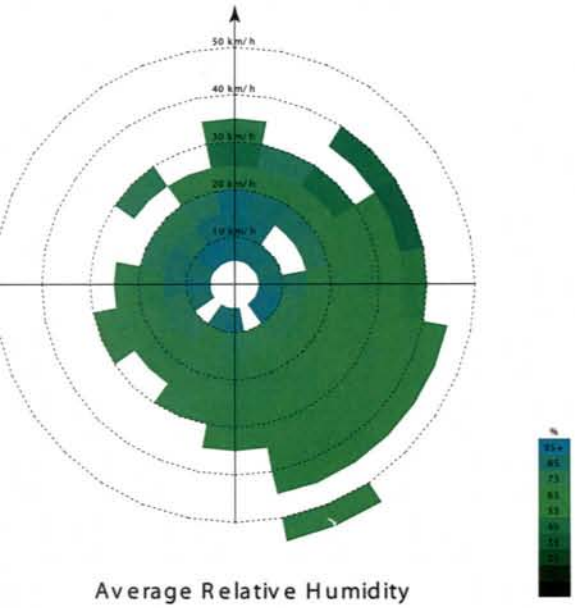
Wind Frequency (Hrs)



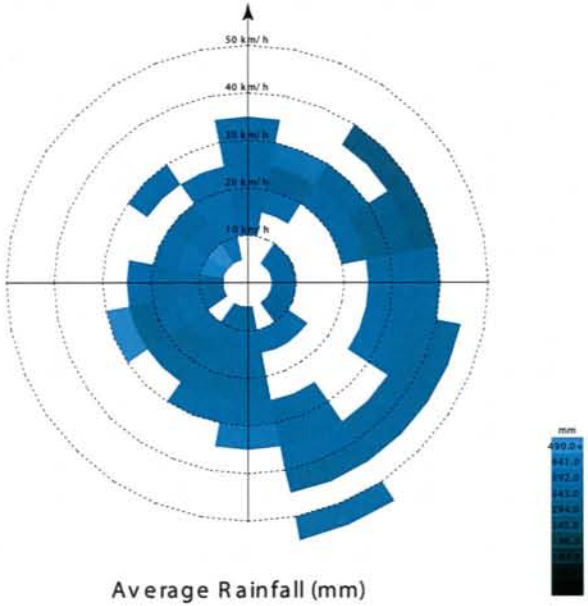
Average Wind Temperatures

	High:	Low:	Average:
Temperature:	94.1 °F	65.4 °F	81.0 °F
Dew Point:	79.8 °F	57.2 °F	72.9 °F
Humidity:	98.0%	42.0%	77.2%
Wind Speed:	17.0mph from ESE		-
			3.3mph
Wind Gust:	42.0mph from ESE		-
			-
Wind: -	-		ENE
Pressure:	30.09in	29.58in	-
Precipitation:			34.15in

Source: Emergency Center Mercedita airport
Ponce Puerto Rico



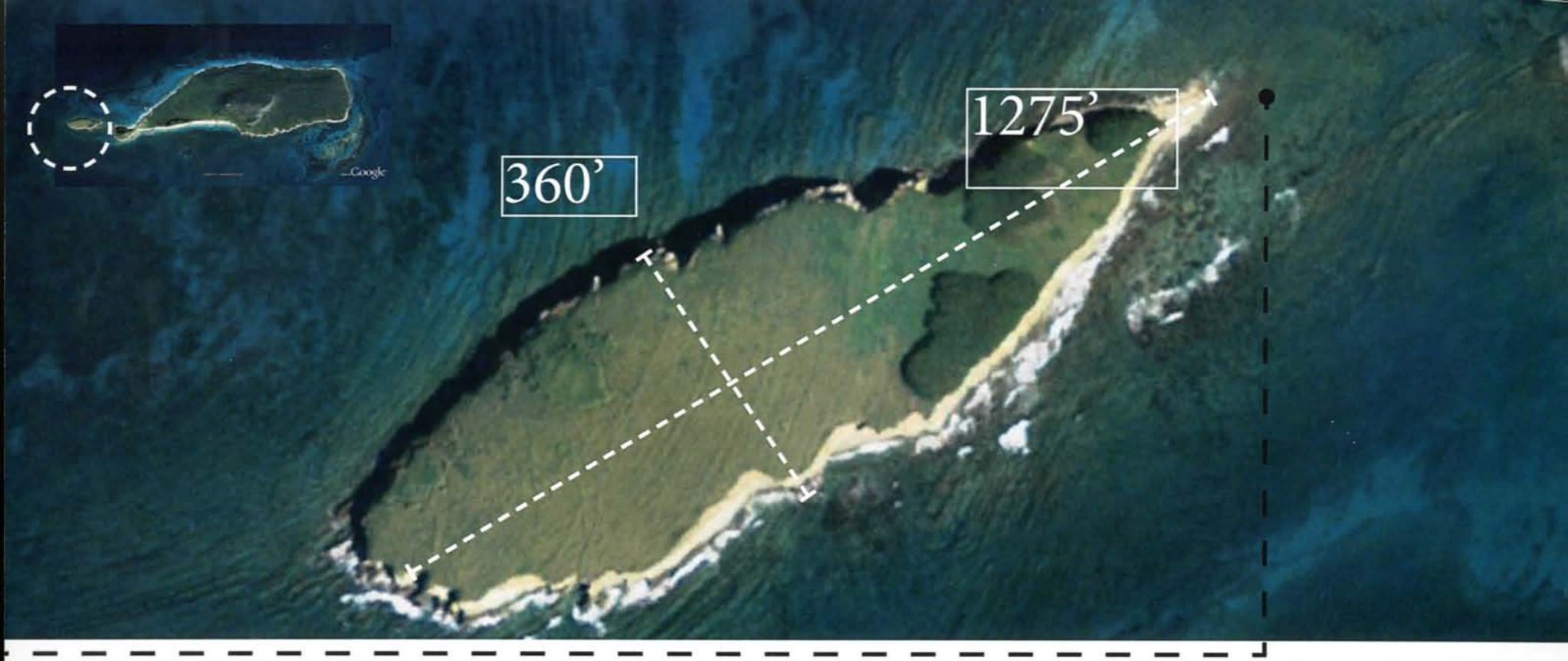
Average Relative Humidity



Average Rainfall (mm)

The Site

" People do not pay attention to this site it is like it is not even there." (statement od a local visitor)

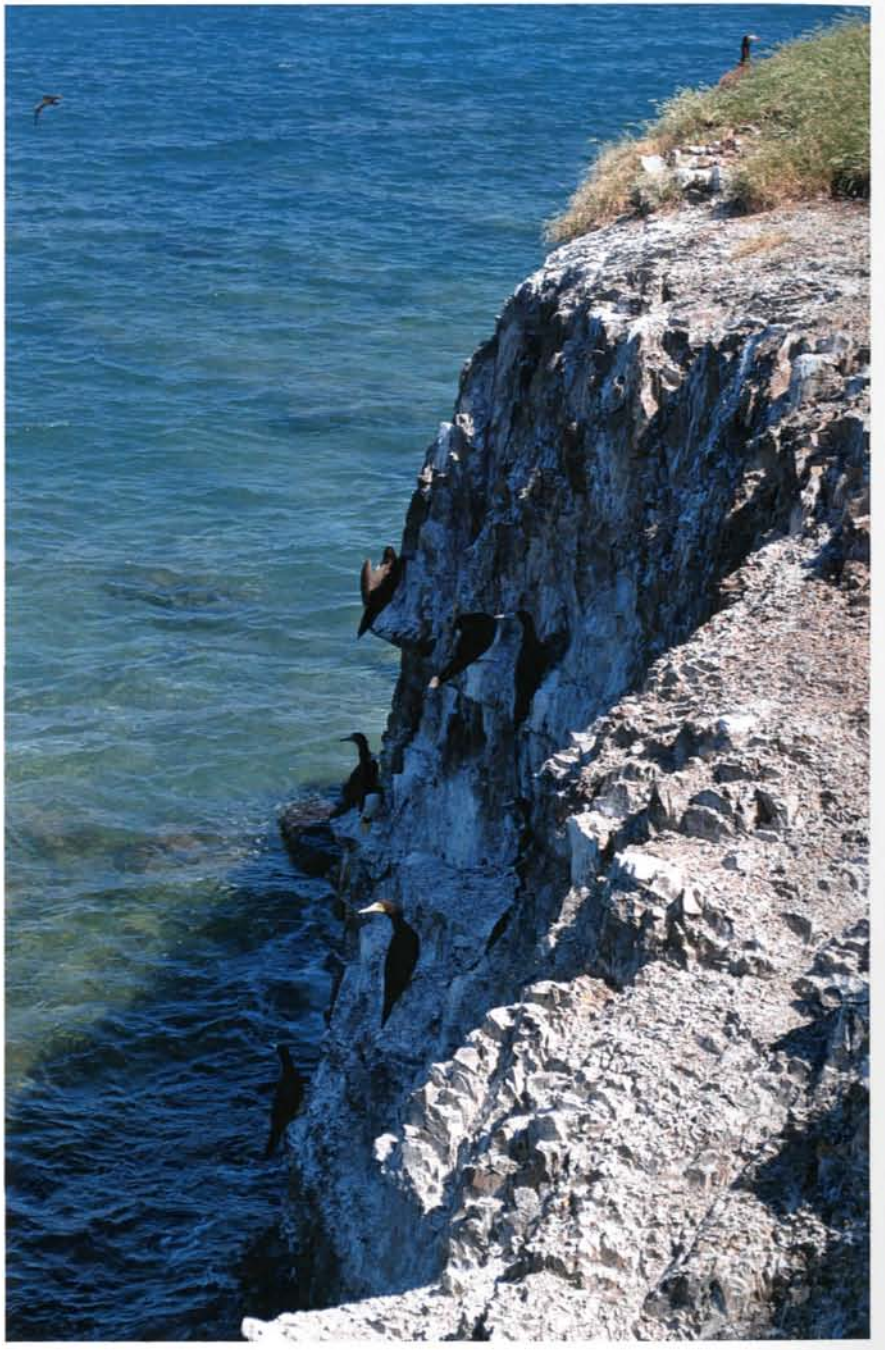


Area: 367,256 sqr f, Current altiude: 10ft above sea level

Size of the island in comparison to an aircraft carrier

Size fit experiment Salk Institude by Louis Kahn.

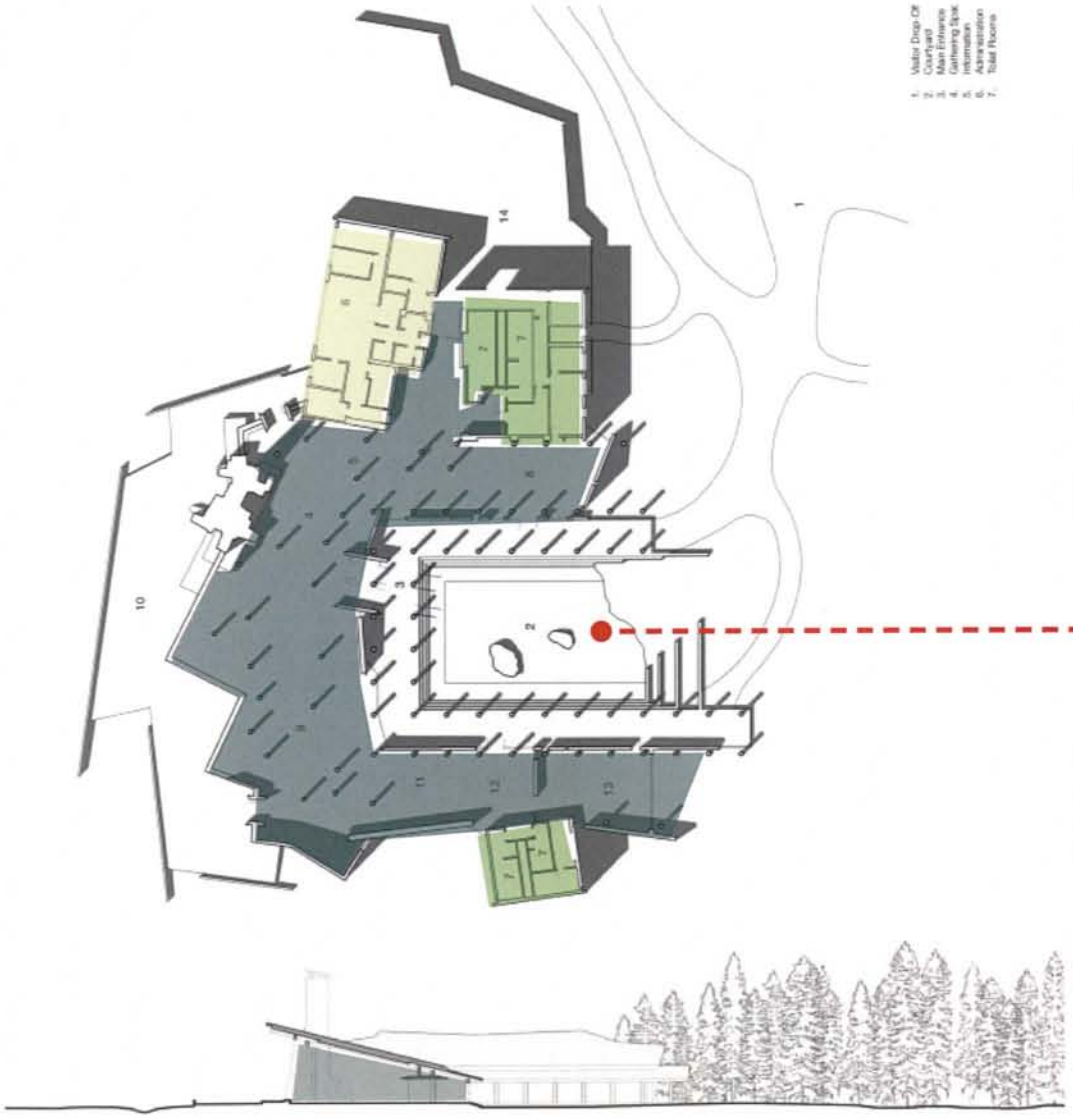
Size fit experiment collage marina in Casa de campo the dominacan republic and the gardens at the of versalles, France.



Precedents Visitor Centers

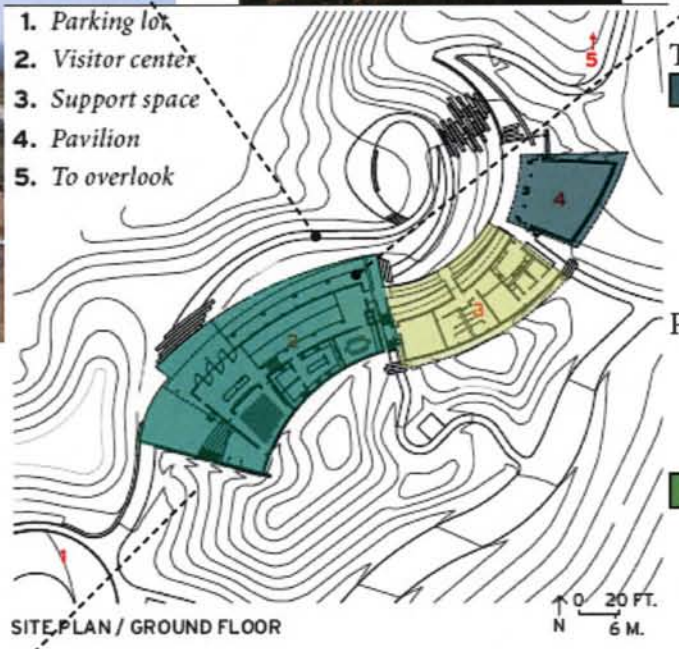
Craig Thomas Discovery and Visitor Center / Bohlin Cywinski Jackson
Grand Teton National Park, Wyoming, USA

size: 2,044 sqm



Baldwin Hills Scenic Overlook Culver City, California by Safdie Rabines

1. *Parking lot*
2. *Visitor center*
3. *Support space*
4. *Pavilion*
5. *To overlook*

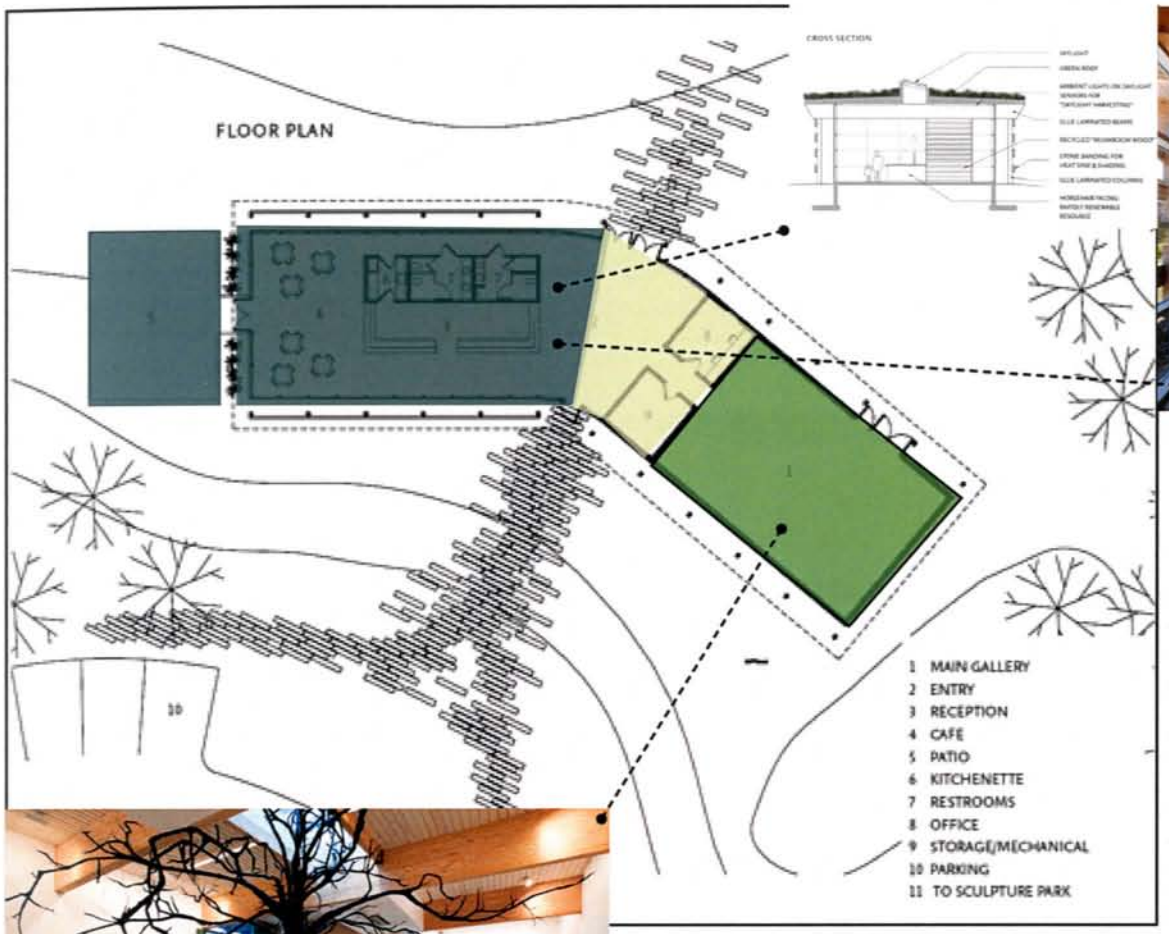


Tourist center 3400 sqr ft

Pavilion 1150 sqr ft

Support space 1790 sqr ft

Charles Benenson Visitor Center and Gallery at the Art Omi International Art Center



Program: A 4,200-square-foot gallery and visitor's center set on 120 acres.

Design concept and solution: This contemporary sculpture park, located in the hills of Columbia County, New York, serves as a gateway and resting place for a 150-acre visitor center that houses over 80 outdoor installations. An indoor gallery houses interior exhibitions and serves as a venue for lectures, concerts, and public programming in the arts. Large expanses of curtainwall glazing set against stonewalls contribute to effective daylighting. The project was awarded LEED Silver certification in part because of its green roof, use of solar power, and recycled materials.

Gross square footage:
4200 sq. ft.

Site size:
120 acres

Program Site Fit

Island Information Space

This is the first place people encounter when they arrive at the eco resort. This place should be the first connection to nature and to the hotel. In should be a space of information where one gets a feeling of time, place, location and orientation of the island. This place should provide visitors with a cosmic experience that connects them to the island and invites them to explore further.

Cultural

This is al place where the ritual of eating and tasting celebrated and where there is a connection to nature's phenomena. Displays-local food. Roasting pig, Fituras, fresh foods, chefs cooking in front of the guests. The space when it is not being used for Dancing area- allowing for clases of salsa, bomba and other regional dances.

Rooms

Rooms, the place for private meditation where one can get a more intimate and personal connection with the cosmos and the phenomena of nature. This is a place of silence where the only thing that can be heard is the nature. The room is small but emphasizes on the "absolute" and vastness of the sea in the horizon. They are a crucial program in the building because in this place that most people can make the most connections back toward the guests normal lives. So the rooms should also be didactic in the rooms ability for having guests Interaction with building systems that allow them to modify the room to their particular needs. Making the hotel rooms attractive and comfortable are strategies used in dry .

Garden

Place to connect to the phenomena of vegetation. Place of multi sensorial learning where one can connect to vegetation through smell, taste, a touch. This is a place also the one can see way we are dependent of nature to decompose our waste and produce food.

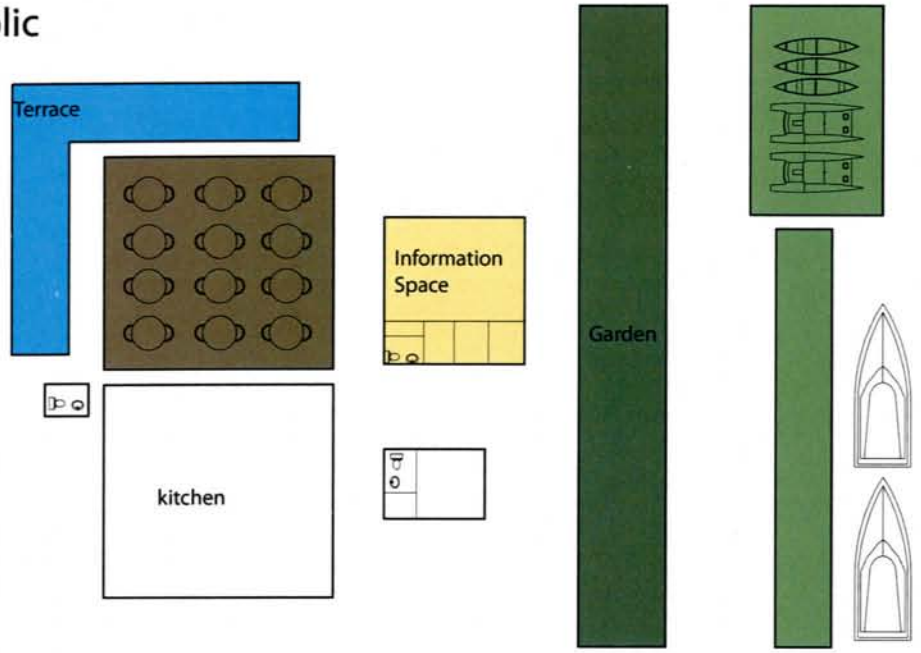
Terrace

Usually terraces are the places on goes to catch the breeze and socialize. This hotel will keep that tradition but engaging the phenomenon of wind by the use of silent wind turbines.

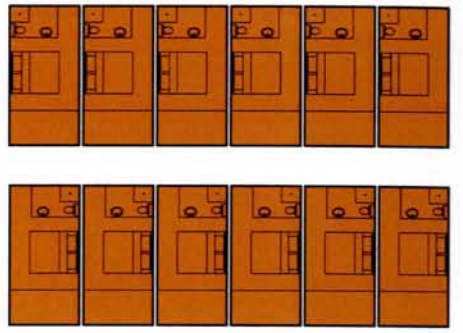
Program Size

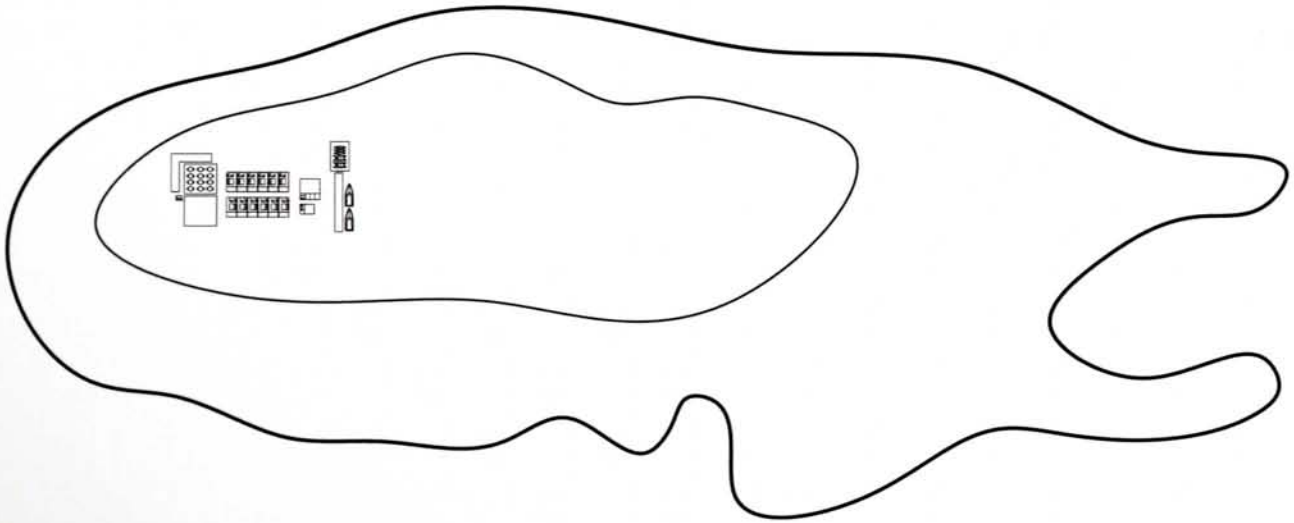
information space	500 sq ft
front desk	100 sq ft
offices	50 sq ft
Toilet	25 sq ft
Cultural restaurant	
Dining	1,000 sq ft
12 Tables for 2	
Kitchen	
5sft per person times 24	360 sq ft
Outdoor terrace	1000 sq ft
Toilets	25 sq ft
Deck	480 sq ft
Boat House/matenece storege	560 sq ft
Private	
12 **Rooms**	250 sq ft
Garden	50 sq ft
Bathrooms	30 sq ft

Public



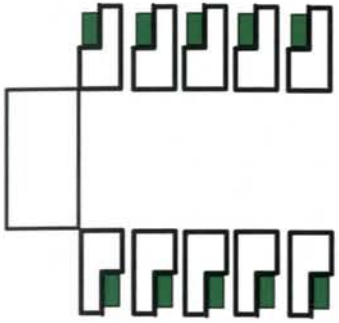
Private

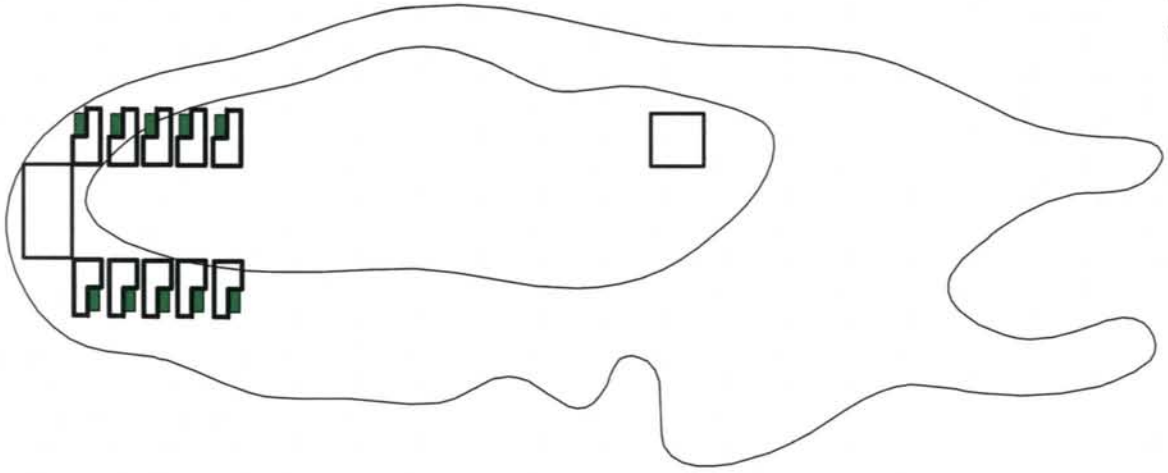




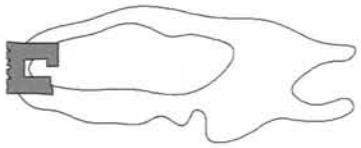
Monastery Galluzzo

units 30 x 60 = 1800 sqf area
grean space 15 x 30 = 450 sqf area
bathrooms = 150 sqf area





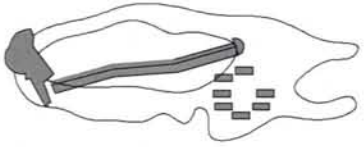
Comparison of scle making the rooms in eco resort the same size as the ones in the monastery galluzzo.



Louisium Hotel , Austria

Main space (28514.4055 square ft.)

Room space (28514.4055 square ft.)



Hotel at kangaroo island

Main space

restaurant, cava, lobby, front desk

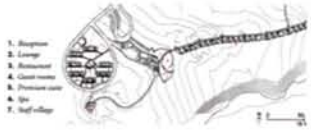
(23926.4126 square ft.)

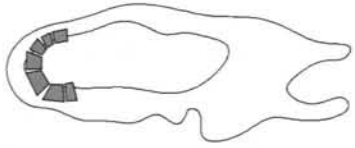
Rooms (1090.8954 square ft.)

Baths rooms (106.8474 square ft.)

Porch space (278.7265 square ft.)

Staff quarters (1781.8049 square ft.)

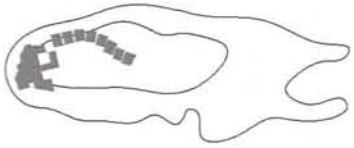




Marina at Casa de Campo la Romana,

Dominican Republic

(23426.5148 square ft.)



Peter Island Resort

Villas (1563.0218 square ft.)

front desk, Lobby Gift Shop and Rest

(22954.5914 square ft.)

Conecting to the Region

"Architecture possesses a marked capacity to be expirienced by the entire sensorium... senses other than the optic nerve are involed in experiencing a architeture" (Kenneth Framptom)

Architecture in Ponce

Top: typical house in ponce raised 4 to 5 feet with a balcony on the front

Down: precedents of architecute in Ponce

top: Typical two story inner court yard hall way. One can see the louvers i the windows filtering the sun light while providing for ventilation the se louvers are operable so that the mount of light going in can be controlled more alos these halls serve as buffer zones for heat gain during the day.

Top:recent renovation of the inner courtyard of a house in ponce.

Down:Serralles Castel in a spanish revial sytle

In terms of tradition in architecture, the nearby town of Ponce the south region of Puerto Rico is very rich in architectural history in. Being the location for the production of sugar and rum, the region has been able to commission and attract good architects from the school of Beaux-Arts in Paris, Barcelona and even form Syracuse School of Architecture. Ponce was a center of the sugar trade in Puerto Rico in the 18 and 19 century. As a result, Ponce enjoyed a flourishing economy, which made it a very rich city. And the pride of the pride of the city was and still is the architecture. The city is very particular in that it has chamfered corners like the Cerda plan in Barcelona something that it was not done in any of the other of the town in Puerto Rico. As a result the corner conditions are particularly celebrated in Ponce. Also particularly celebrated is how the buildings are ventilated by the use of elaborate lattice and louvered windows. One could argue that the best portfolio of architecture in the island lies here, with styles going form the neoclassic, Spanish Revival and Art Deco. One could even say the city has its own vernacular architecture. It's interesting that one of Ponce's most distinguished architects was trained in the Beaux-Arts movement. Ponce has so much pride for their city that they have a saying that "Ponce is Ponce and the rest is parking"

"Prospects for Critical Regonalism"

"Architecture possesses a marked capacity to be expirienced by the entire sensorium... senses other than the optic nerve are involed in experiencing a architeture" (Kenneth Framptom)

Critical Regionalism

·This is a Reaction to the sense of placeless ness of the modern movement by being simpathetic to the local region.

Architecture that is critical and values the buildings context but is not a romantic representaton of vernacular architecture.

Critical in Aspects

Myth of the region

"Schools as ways to create self-conscious culture, evoked sub cultures wrights Prairie houses or Alvaro Siza minimalist constuctivist."

Information and experience

We are Losing of our capacity to experience space

Typology / Topography

Architectonic/ Scenographic

Visual/ Tactile

"Materials and surfaces can be as much part of the over all perception of the architecture, as the presence of visual form. Air movement and acoustics ambient temperature and smell all these factors affect our experience of space."

Post-Modernism and regionalism: A summation

"The first who seem to be the more prominent in the eyes of popular press, are those who feel that the entire apparatus of the avant-gar<;le has been-discredited and that no choice remains but to abandon this osteibily radical discosrse and return to tradition."

"Above all, it is a concept of the enviroment where the body as a whole is seen being essential to the maner which is experience."

It interesting to see how the ideas of phenomenology and the ideas of critical regionalism are not so different from one another. They both look to target our perceptions to give a certain connection.

Middleton Inn Charleston, S.C. Clarke + Menefee

Fotograph of a Traditional Charleston House

In both of the images we can see how concrete is used to reinterprete the typical charleston house in a rural setting.

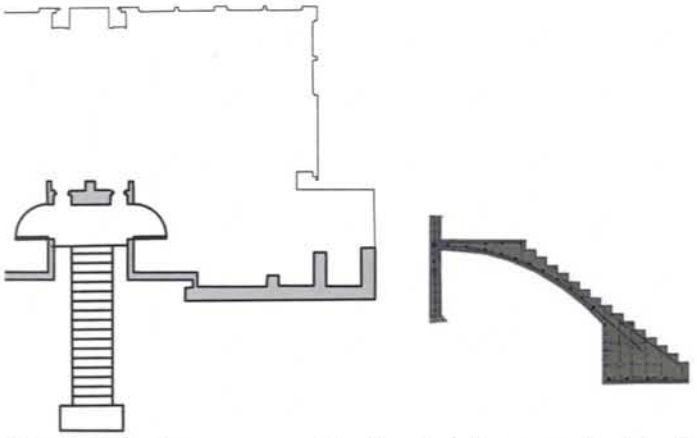


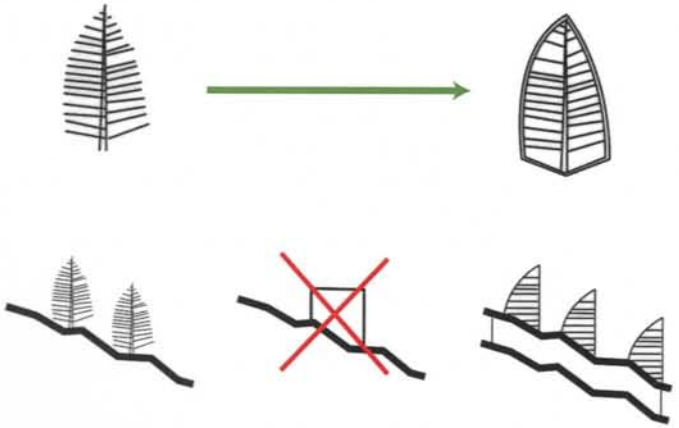
Diagram of entry sequece and Section Detail of concrete stair. One can see that the en entry sequence is made to resemble the Charleston house but using a concrete instead of wood.

"The Inn was remote from city tourist attractions, and Clark "capitalized on this and made it a rural retreat in the woods." The Inn was filled with Charleston details, which helped to bridge the gap between the city and the rural hideaway in the woods. These details included terra-cotta chimney pots, wooden shutters, stick-style furniture, special stucco called "slave coat," and Charleston Green paint, which accentuated the building in the midst of the trees and growth in the surrounding woods."

"distil a didactic language through which both formal meaning and construction can be revealed and understood." It was also said that their houses were "idealized pavilions sitting solidly on the site in the classical manner."

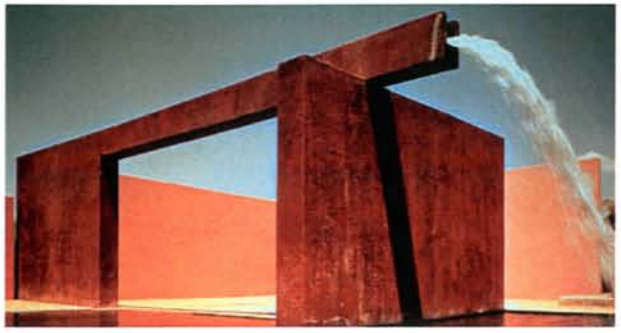
Their structures had a simple and clear formal order, and were compact in plan. Their belief was that generosity was achieved in section.

Wellness Center Mario Botta, Switzerland



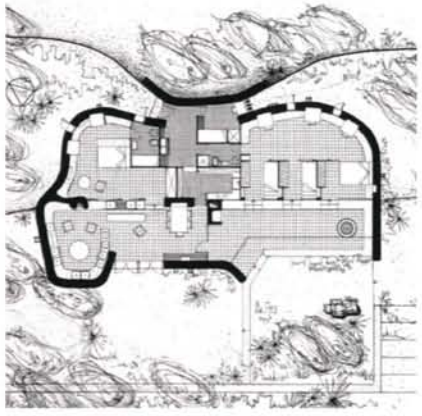
His designs tend to include a strong sense of geometry, often being based on very simple shapes, yet creating unique volumes of space. His buildings are often made of brick, yet his use of material is wide, varied, and often unique. "build an site" as pimary forms agi-nats the topography and the sky. Traditional agricultural structures which the form de-rives.

Houses of Luis barragan



We can clearly see how Barragan takes the modernist international style and gives it phenomenal qualities with the use of vibrant colors typical of the Mexican culture. Also he uses water as another way to counteract the feeling of placelessness in modernism and be sympathetic to the traditions of the Mexican estancia. The fountains are a very important part of his work and how they are a celebration of water which is scarce in that area.

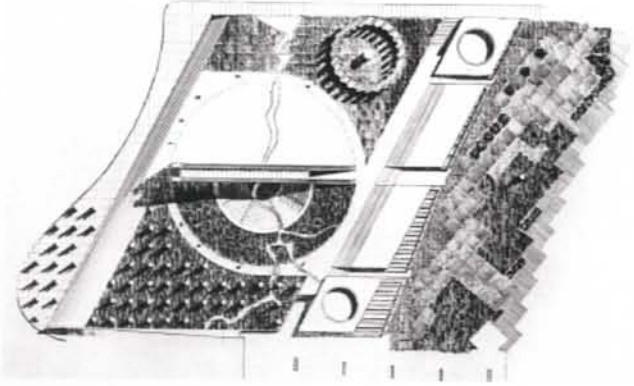
Walden 7. Summer house in ibiza Ricadro Bofill



Tadao Ando Modern Art Museum of Fort Worth

I use these two image to show how one can be very critical about reginalism while still leaving strong reagional sense of meaning in the architecture.

River front Plaza Wolf associates

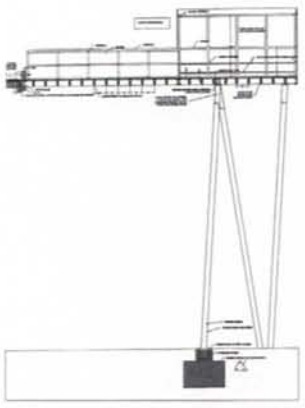


I like this project Frampton presents us because it functions as a historical didactic tool, which is regionalism specific. This project for a giant sundial in Fort Lather dale marks specific date on the regions history. This is an example of regionally didactic architecture. This strategy is used in many schools to mark important dates so that their students remember them.

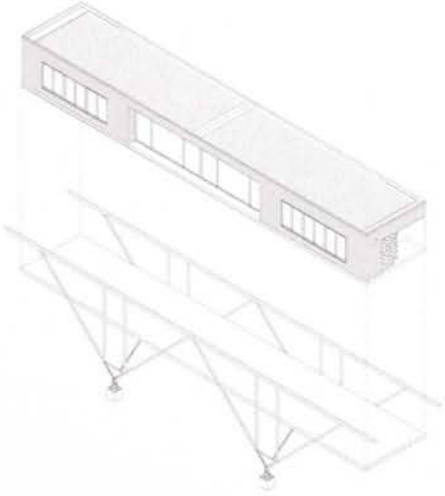
Strategies to Dealing With Unique Sites

Touching as little as possible

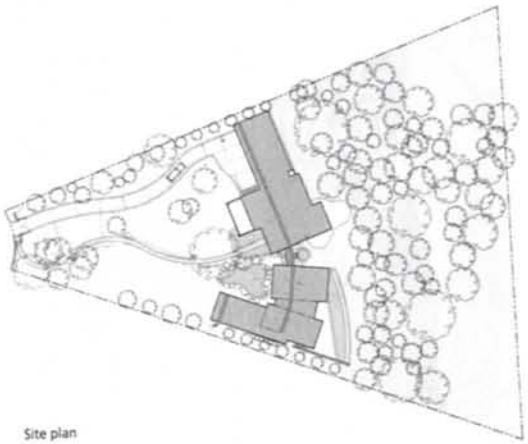
Chateau-le-Lez, Motpellier France
Eduard Francios

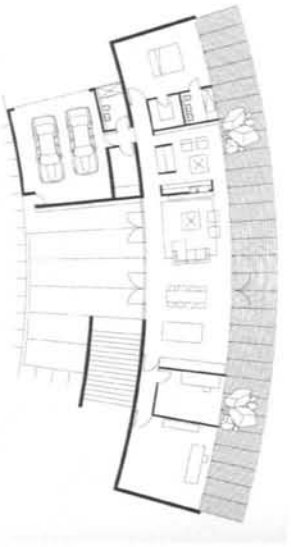


Bridge house Max Pritchard, Australia



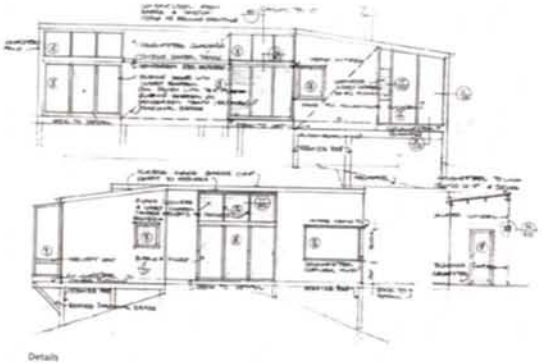
Projecting Views

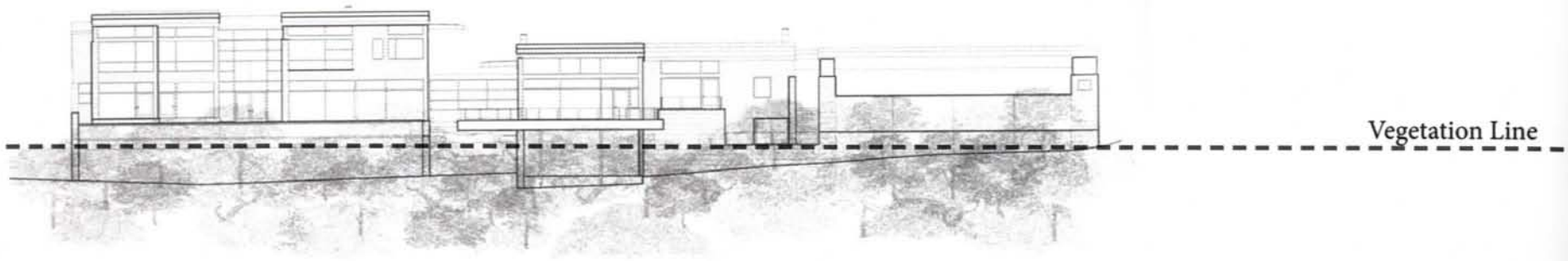




House in Tuson Arizona, Ibarra Rosano Architects

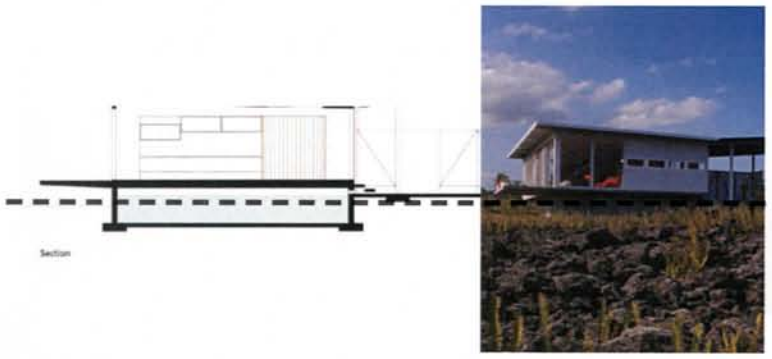
Closeness to Nature



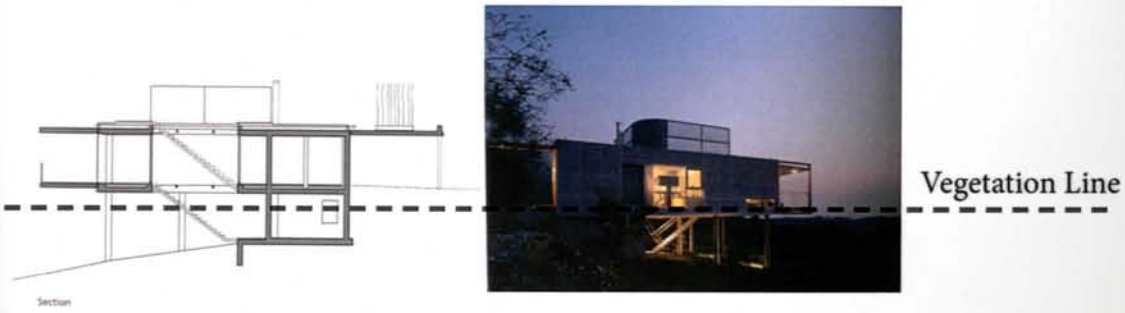


North elevation

House in Tuson Arizona, Ibarra Rosano Architects

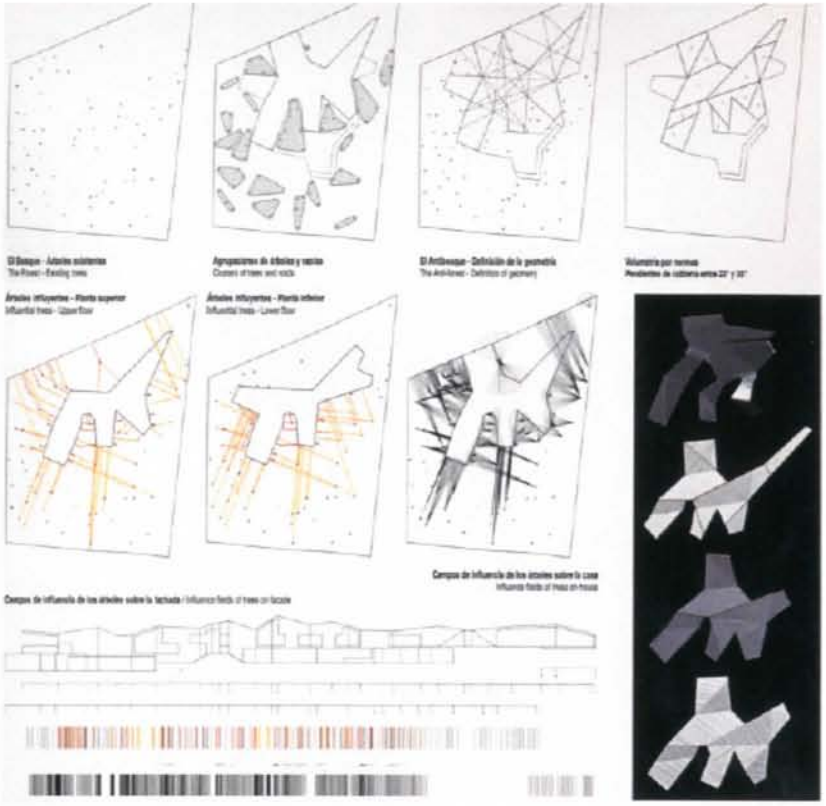


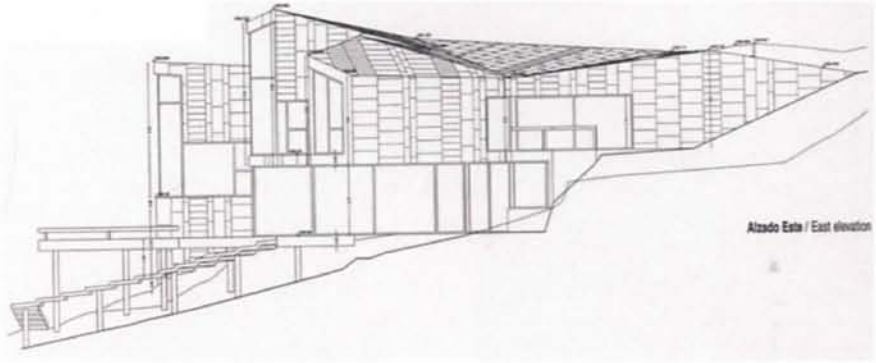
Jennings Residence , work room design
Australia



Smuck house, Austria, Hans Gangoli

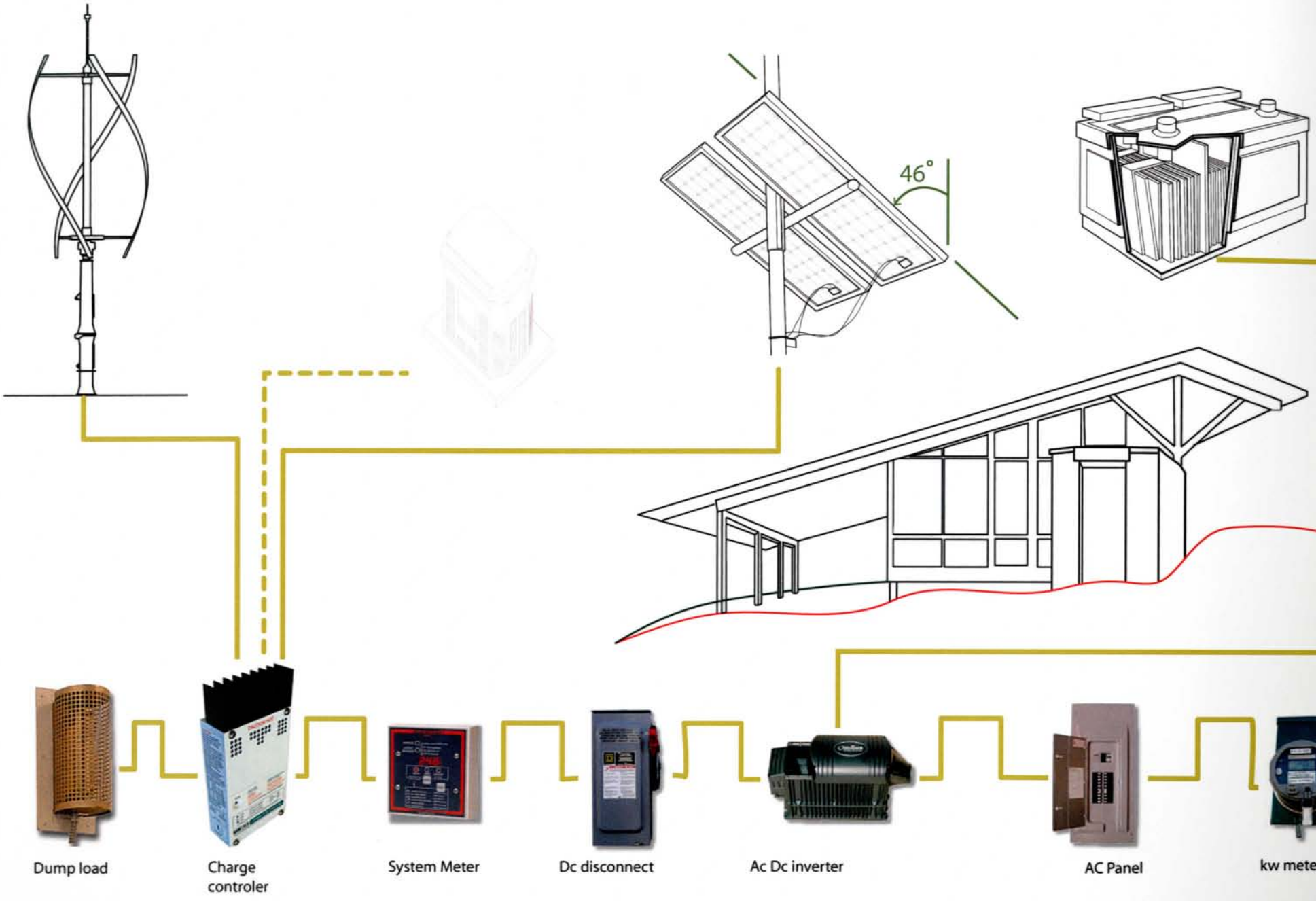
Levene house Eduardo Arroyo Madrid, Spain



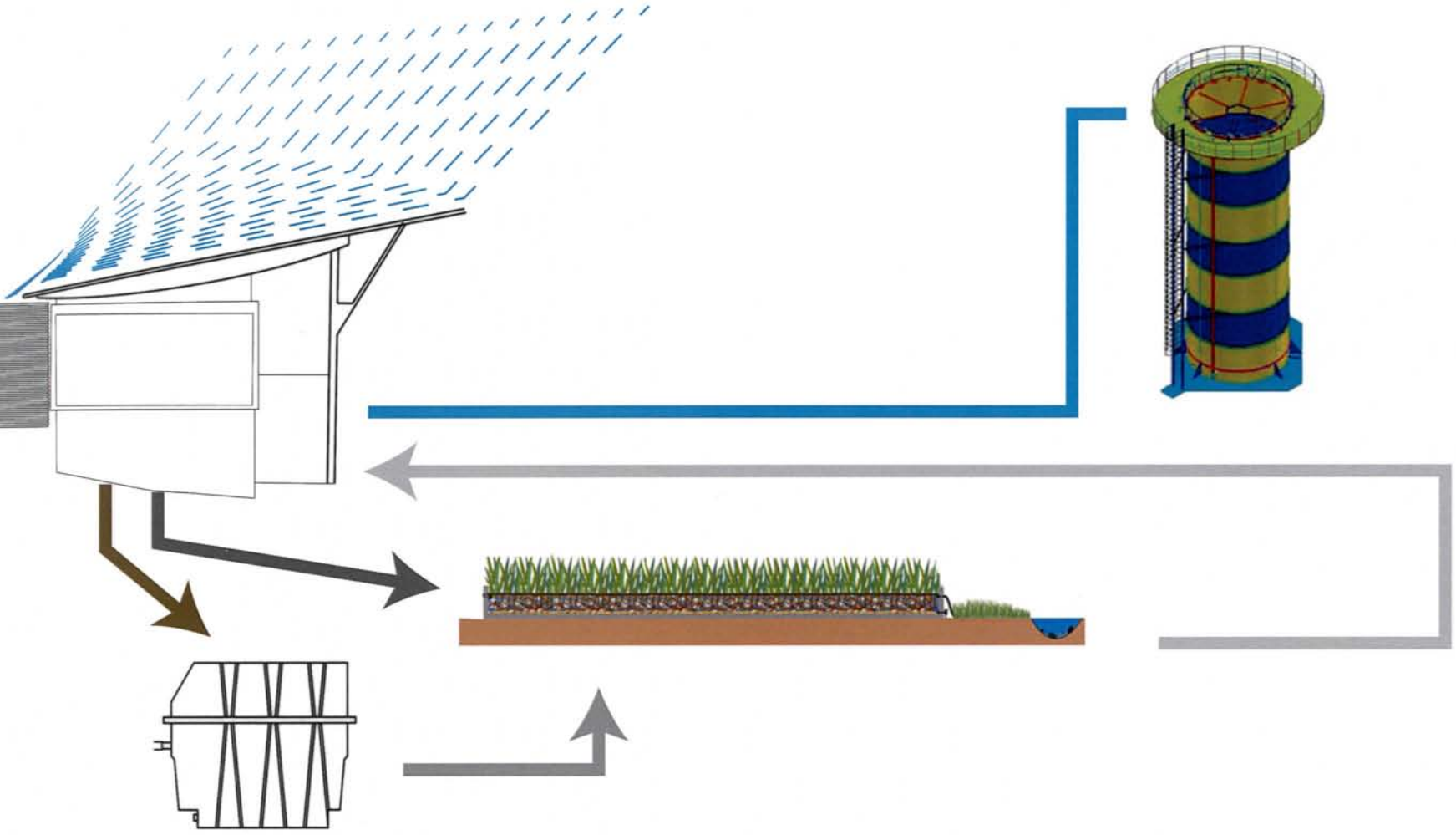


In this project one can see how the idea of touching as little as possible can provide the design with the opportunity for integration of vegetation with nature. Also the use of projected views help to bring the occurrences of the forest back into the space.

Catalog sustainable technologies

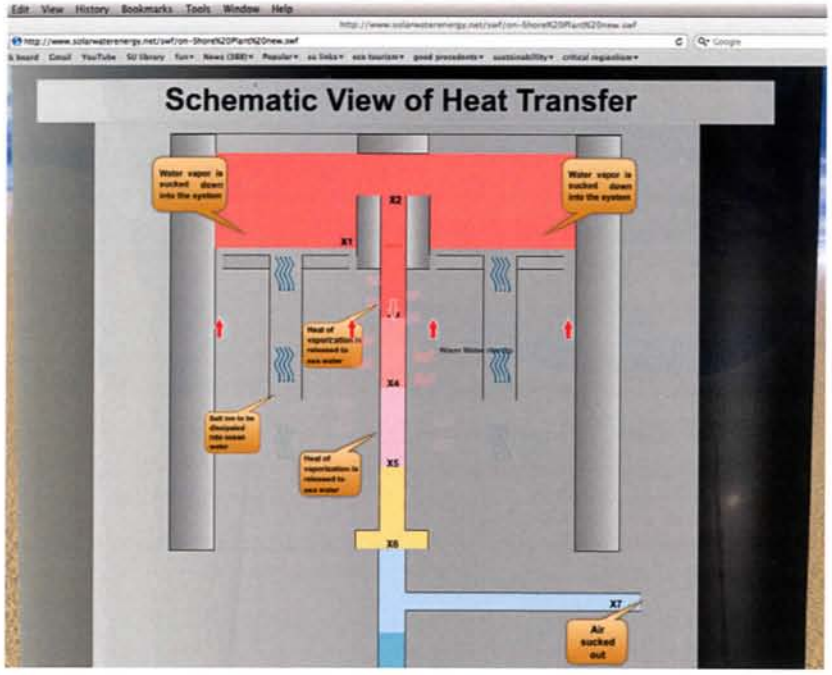


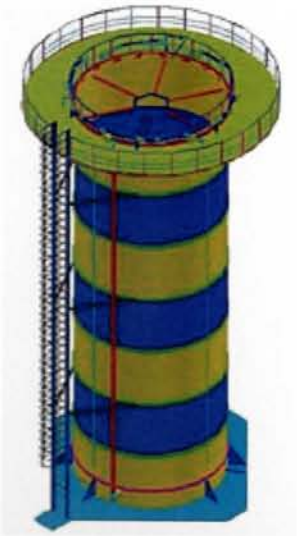
Energy Sustainability Systems



Water Sustainability Systems

Solar Destilation of Water

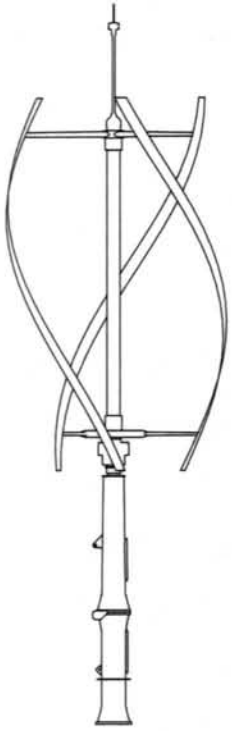




Solar cells overlay a confined body of water in an evaporating tank
Water vapor is condensed in copper pipes under the cells
Heat consumed to evaporate the water is released back to the body of water when condensation occurs in the copper pipes, where it warms up the raw water
Warmed water will rise up towards the solar cells on top of the tank where it is heated through solar rays, and the resulting vapor is guided back to condensing pipes
The outcome is distilled water and some reject water.
Conventional desalination systems are expensive to build and consume a great deal of energy, which makes them expensive to run. Capturing, storing and efficiently harnessing solar energy has been the dream of generations of researchers. At SWE, we have developed the technology to optimize the natural resources of solar energy, ocean water and brackish water to produce life sustaining potable water and electricity at nominal cost, making researchers' dreams a reality.

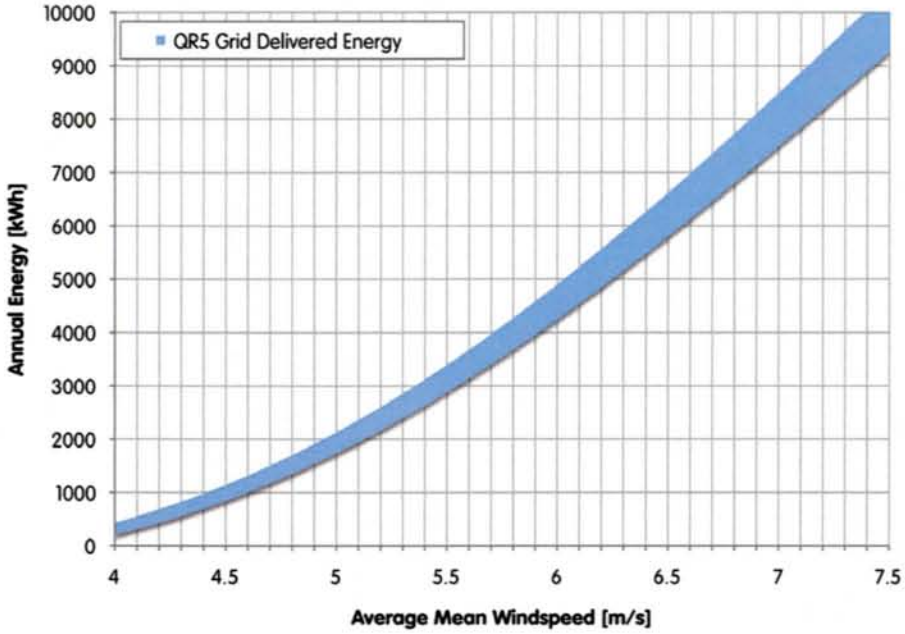
On-shore solar distillation systems are contained in steel or concrete tanks over the ground and process ground or brine water. Solar energy increases the temperature within the water production structure, with minimum use of fossil fuels. The desalination process continues 24/7. The smallest plant will produce 230 m3/day. The average return on investment is 35% PA.

source: http://www.solarwaterenergy.net/technology.html#



QuietRevolution Windmill:

Wind turbines are considered the most effective way to make power in comparison to other alternative fuel sources. It is so effective that it can match the rate of production of fuel energy production. The wind resources in Syracuse are exceptionally favorable for a wind turbine.



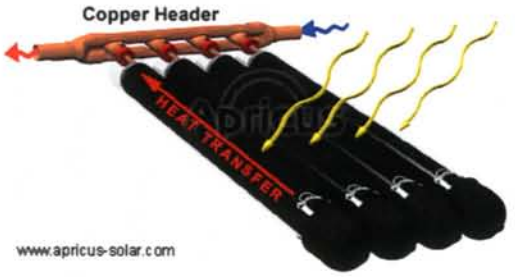
There are many advantages of vertical axis wind turbines (VAWTs):
VAWTs are not affected by the direction of the wind which is useful in areas where the wind changes direction frequently or quickly. Unlike traditional horizontal axis wind turbines no mechanism is needed to turn the wind turbine towards the wind meaning better performance in areas where a tall tower isn't feasible, obstacles are nearby, or the wind is more turbulent.
VAWTs are better able to harvest turbulent air flow found around buildings and other obstacles; situations more common in areas where people live.
VAWTs are ideal for both rural and urban applications including roof top installations. Depending on the roof's shape, wind flow over the roof may even be concentrated leading to an increased energy output.
Simple to install and maintain

Quiet operation

Pleasant appearance

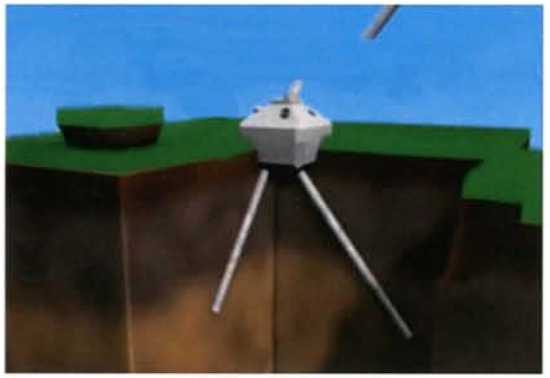
less harmfull to birds

Evacuated tube solar collectors



Evacuated tubes are the absorber of the solar water heater. They absorb solar energy converting it into heat for use in water heating. Evacuated tubes have already been used for years in Germany, Canada, China and the UK. There are several types of evacuated tubes in use in the solar industry. Apricus collectors use the most common "twin-glass tube". This type of tube is chosen for its reliability, performance and low manufacturing cost.
In order to maintain the vacuum between the two glass layers, a barium getter is used (the same as in television tubes). During manufacture of the evacuated tube this getter is exposed to high temperatures which causes the bottom of the evacuated tube to be coated with a pure layer of barium. This barium layer actively absorbs any CO, CO2, N2, O2, H2O and H2 out-gassed from the evacuated tube during storage and operation, thus helping to maintaining the vacuum. The barium layer also provides a clear visual indicator of the vacuum status. The silver coloured barium layer will turn white if the vacuum is ever lost. This makes it easy to determine whether or not a tube is in good condition. See picture below.

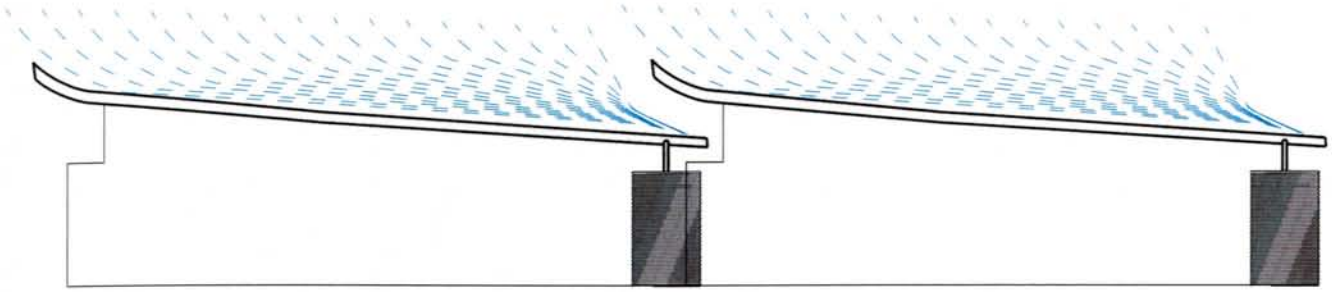
http://www.apricus.com/html/evacuated_tubes.htm



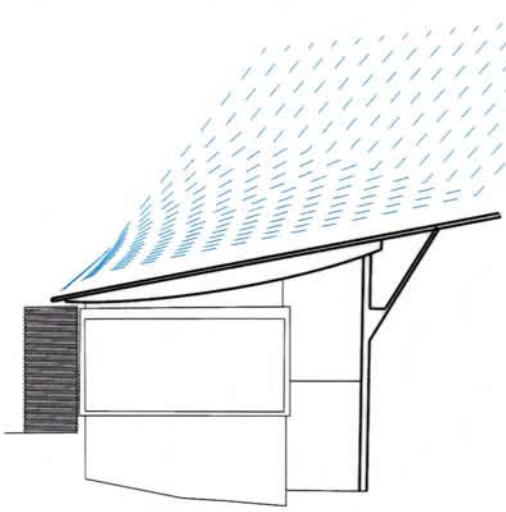
"L.I.F.T. requires little or no excavation. Sections of foundation wall are poured at grade and "pinned" into the ground using heavy-duty steel pins that extend deep enough to support the structure and prevent uplift. Grading is left to smaller equipment that simply "feathers" the existing surface soils without having to strip them all away. Lot-by-lot com- paction is all but eliminated. The advantage of the L.I.F.T. system for stormwater management is that the native soil structure continues to absorb and process rainwater. Runoff from roofs can be directed back into perimeter soils. Depending on the characteristics of the site, detention ponds, drywells and piping can be reduced in size. Less digging also reduces the size and impact of spoils piles and their contributions to erosion. Leaving healthy upper soil layers allows for better plant or sod growth that can also reduce the erosion potential of developed soils. Pin Foundations has created a mathematical model for civil engineers to use in calculating the volume of flows restrained in surface soils that are not compacted, and has

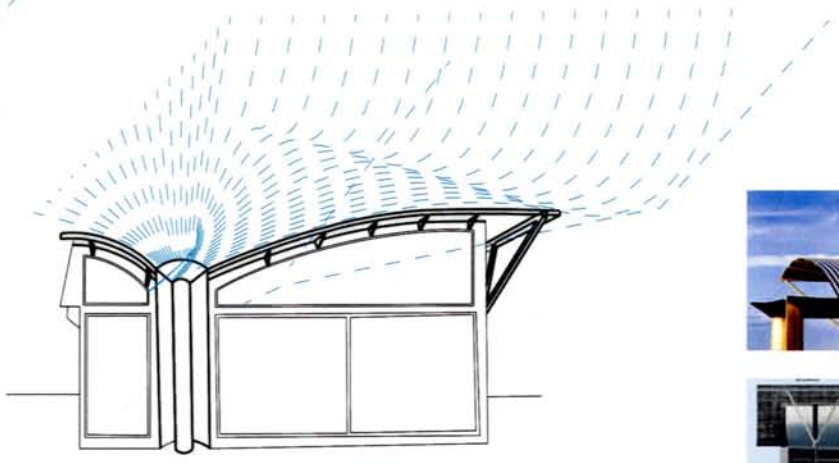
Source: (Innovative Foundations, Low Impact Foundation Technology. http://www.psparchives.com/publications/our_work/stormwater/lid/LID_studies/innovative_foundations.htm. nov 9 2010)

Water collection Roof Diagrams



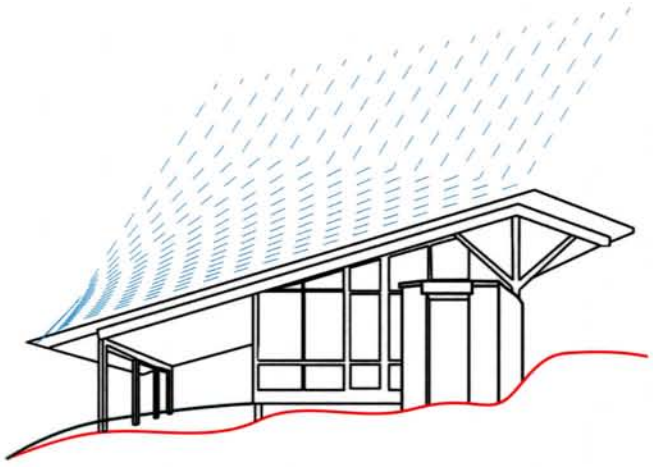
Kangaroo Eco Resort
Australia



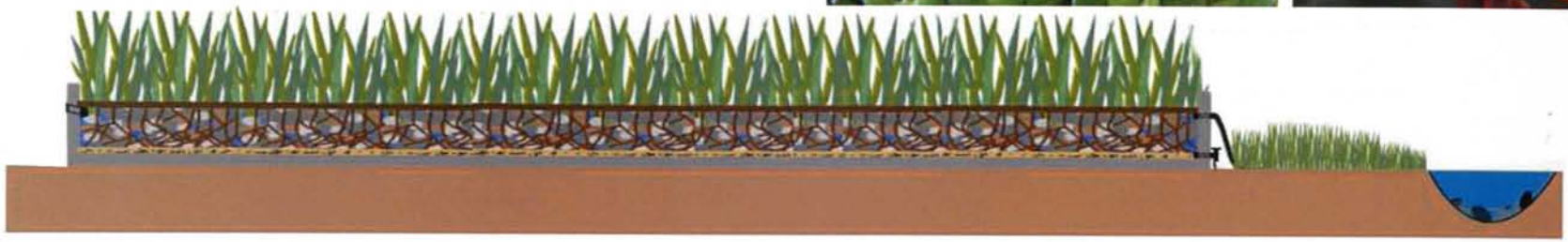


Magney house
Glenn murket

Simpson House
Glenn murket



Grey water treatment Wet Lands

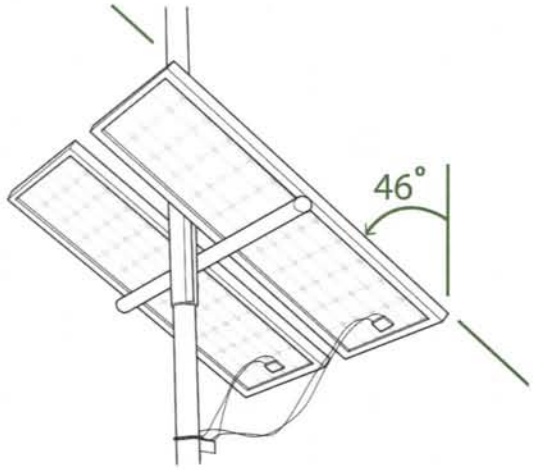


Cattail, bulrush, reed and sedge species are all common in constructed wetland ecosystems. They play various roles in a constructed wetland. Some remove heavy metals, while others are more skilled at removing organic matter.

Phragmites australis, the common reed, is often used in water treatment in Europe to remove nitrogen. However, it can be invasive in North America and Australia. Duckweed (Lemnoideae family) also removes nitrogen and phosphorus. Typha has shown promise for removing heavy metals, and for those who weave, its vegetation can be used for mats and baskets. Iris and water hyacinth can also remove heavy metals such as lead, copper, zinc, nickel and cadmium, but take care, as water hyacinth can also be invasive in many locales.
As with all choices of wetland plants for the garden, plant species should be chosen with local ecology in mind. Always check with local wetland plant experts to ensure that a species is not invasive in local wetlands. Many wetland species breed and spread easily!
A wetland garden can be full of life. It can also add to the sustainability of a home by allowing a gardener to conserve and reuse gray water. Turn a pond or a wet garden into a place that works for the planet by reframing it as a water treatment system.

Examples of floating plants are duckweeds and water hyacinths. Duckweeds can absorb large quantities of nutrients. Small ponds that are overloaded with nutrients such as farm fertilizer run-off can often be seen choked with duckweed, appearing as a green carpet on the pond's surface. In a two and a half acre pond, duckweed can absorb the nitrogen, phosphorous, and potassium from the excretions of 207 dairy cows. The duckweed can eventually be harvested, dried, and fed back to the livestock as a protein-rich feed. Livestock can even eat the plants directly from a water trough.22
Algae work in partnership with bacteria in aquatic systems. Bacteria break down complex nitrogen compounds and thereby make the nitrogen available to algae. Bacteria also produce carbon dioxide which is utilized by the algae.23
According to the US Environmental Protection Agency, "Constructed wetlands treatment systems can be established almost anywhere, including on lands with limited alternative uses. This can be done relatively simply where wastewater treatment is the only function sought. They can be built in natural settings, or they may entail extensive earthmoving, construction of impermeable barriers, or building of containment such as tanks or trenches. Wetland vegetation has been established and maintained on substrates ranging from gravel or mine spoils to clay or peat . . . Some systems are set up to recharge at least a portion of the treated wastewater to underlying ground water. Others act as flow-through systems, discharging the final effluent to surface waters. Constructed wetlands have diverse applications and are found across the country and around the world. They can often be an environmentally acceptable, cost-effective treatment option, particularly for small communities." 16
Source: Constructed wetlands

Lindstrom, Carl Source: The Humanure Handbook. Jenkins Publishing, PO Box 607, Grove City, PA 16127.



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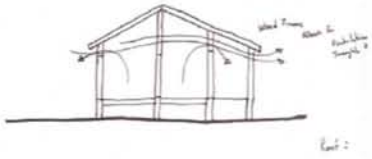
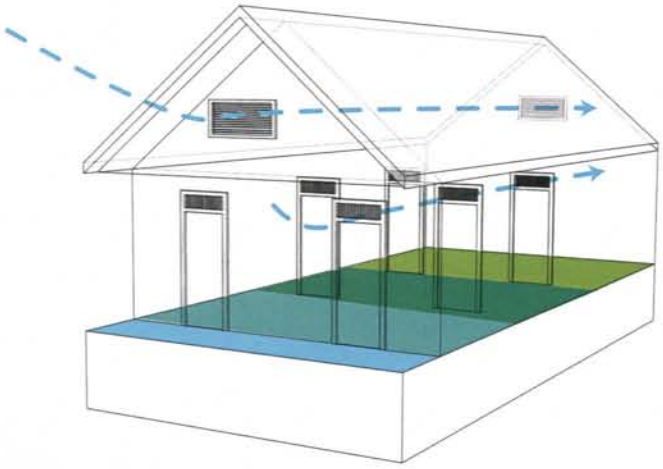
"State:","Puerto_Rico"
"Lat (deg N):", 18.43
"Long (deg W):", 66.00
"Elev (m): ", 19
"PV System Specifications"
"DC Rating:"," 4.0 kW"
"DC to AC Derate Factor:"," 0.770"
"AC Rating:"," 3.1 kW"
"Array Type: Fixed Tilt"
"Array Tilt:"," 18.4"
"Array Azimuth:","180.0"

"Month", "Solar Radiation (kWh/m^2/day)", "AC Energy (kWh)", "Energy Value ($)"

Jan	5.16,	448,	53.31
Feb	5.58,	438,	52.12
Mar	6.08,	527,	62.71
Apr	5.97,	502,	59.74
May	5.50,	471,	56.05
June	5.62,	471,	56.05
Jul	5.75,	494,	58.79
Agst	5.78,	494,	58.79
Sept	5.85,	482,	57.36
Oct	5.40,	463,	55.10
Nov	4.85,	403,	47.96
Dic	4.77,	409,	48.67

The Bronx zoo has recently added a eco restroom to their campus. What is unique about this rest room is that all the waste it produces it converted in to stable fertilizer by these machines. They also store the fertilized until the are ready to be used. Because of This technology they did not had to do a sewer system. In Caja de Muertos a sewer discharge would hard the coasts. This system presents a viable option for the eco resort. The other alternative is to have compositing toilets in each of the rooms but that would be more invasive and unpleasant for the guests.





Ventilation is very important in tropical houses, it takes the humidity and the hot air out and cool air in. This is why it's easy to see a very clear ventilation strategy in a great number of the houses in the region. In these images form Ponce one can the different types of ventilation devices used. Even the poorest houses have the means of ventilation. Its very common for the houses to allow for cross ventilation from room to room across the whole the house so that the breeze is not taped inside the house.

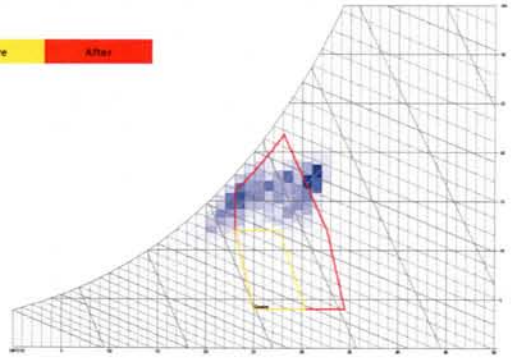
Lattice work in it many different forms is a good way to shade and bring indirect while bringing lighting into spaces of light. Another advantage is that it allows for free ventilation so the spaces stay cool. On the top we ha the use of "celosias" which are small wooden louvers the function as lattice work but also be adjusted for light and ventilation.

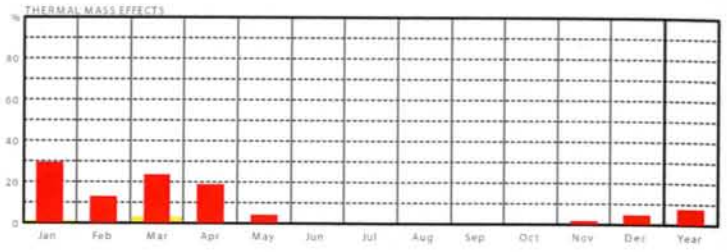
Wind towers are used in dry hot climates to bring cold air into the building or to pull the hot and dry air out. These towers are also used to bring moisture as well. many boats in the Caribbean use similar devices called win scoops to bring the breeze into the bed rooms. This would be a good system to ventilate different part ot the eco resort. Also this is a system could be used by the guest which would lead the to learn new ways to temper with the environments. A similar system is also used in bedzed in to bring air into parts of the houses that have no access to windows. In Caja de Muertos this strategy would be easy to implement because the is a steady stream of wind from the east.

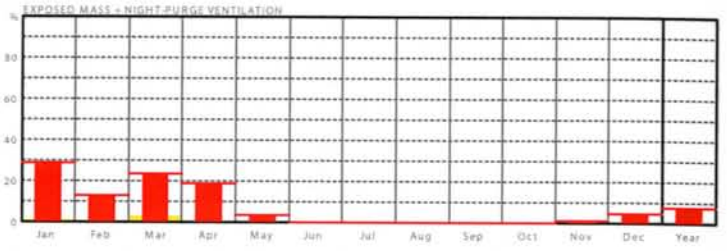
Comfort Percentages

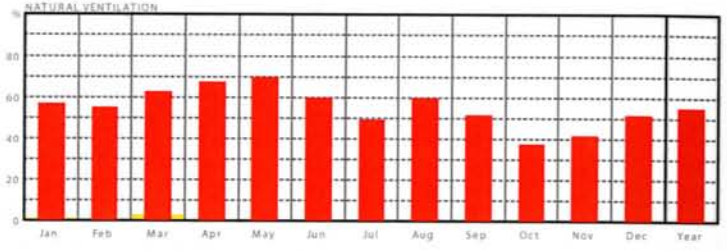
NAME: Mercedita
LOCATION: PRI
WEEKDAYS: 00:00 - 24:00 Hrs
WEEKENDS: 00:00 - 24:00 Hrs
POSITION: 18.0°, -66.6°
© Weather Tool

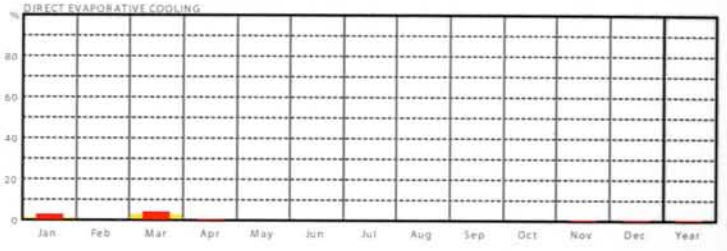
CLIMATE: Af

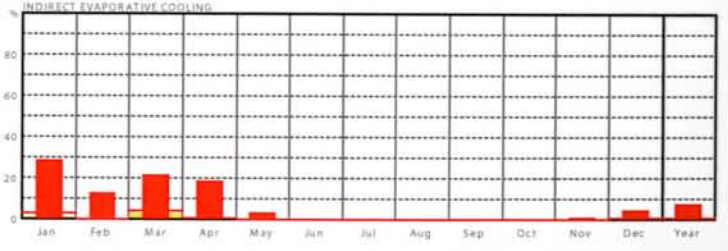












Analisis by Ecotect based on values in Psychrometric chart and the potential impact of pasive design strategies. in the chart above one can see the potential imporvement in comfort levels.

Tropical moist climate where precipitation occurs all year long.
Monthly temperature variation is less than 3 degrees Celsius.
Intense heating and humidity cause afternoon clouds almost every day.
Daily highs about 32°C while night time temperatures average 22°C

Lots of Thermal Mass

"This technique involves the use of high thermal mass materials within the building fabric, both in the external envelope and internally. This has a capacitative effect which tends to even out internal both diurnal and seasonal internal temperature fluctuations."

Natural Ventilation

"This technique involves opening up the building whenever overheating occurs to take advantage of cooling breezes, even if the ambient dry-bulb temperature is quite high. This utilises the evaporation of sweat to provide localised body cooling. The effectiveness of natural ventilation also depends significantly on the relative humidity levels."

Direct Evaporative Cooling

"Basically, air is drawn through a fabric or gauze that is saturated with moisture. As the hot air evaporates some of the moisture, energy is lost in the form of latent heat of vaporisation. A direct evaporative system ducts this cooled air directly into the space. In most instances this is fine, however in areas sensitive to high humidities it can be a problem."

"This technique is not purely passive as it usually requires fan-assisted air movement. However the energy required is relatively low compared to the potential cooling effect, so it is considered here."

Indirect Evaporative Cooling

"In this system evaporative cooling occurs external to the space. The cooled air then interacts with the supply air via a heat exchanger. This way there is no addition of moisture vapour to the air entering the space even if the cooled air approaches saturation. This means increased efficiency even if there are losses in the heat exchange as more vapourisation can be allowed."

Conclusion

Acoording to this analisis the only strategy that has a significan impact on the comfort levels in this region is natural ventilation. Although the indirect evaporative cooling could also have an efect as well as using thermal mass which was the strategy employed by the spanish when they started to build in the island.

Ecotourism Case Study		3 Rivers Eco Lodge	Amsterdam Manor Beach Resort	Barcelo Ixtapa Hotel	Beaches Negril Resort	Beaches Sandy Bay	Binna Burra Mountain Lodge	Bucuti Beach Resort	Casuarina Beach Resort	Coco Palm Resort Spa	Hale Ohia Coltages	Kandalama Hotel	Kona Village Resort	Melia Bali Villas Spa Resort	Royal Plantation Spa Golf Resort	Sandals Antigua Resort and Spa	Sandals Grande St. Lucian Spa and Beach Resor	Sandals Montego Bay	Sandals Ocho Rios Resort Golf Club	Sandals Royal Caribbean	Sheraton Auchland Hotel & Towers	Sundancer Spa & Beach Resort	The Boat Landing Guesthouse	The Summer House	Tiamo Resorts	Venta Club Gran Dominicus	Volcano Rainforest Retreat
Environmental and Social Policy	Appropriate Size, Location, Nature and Scale	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Relevant Enironment Legislation and Regulations Followed	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Staff Training	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Goal Setting and Progress Monitoring		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•	•	•
	Health and Safety, Including Contingency Planning and Risk Management	•		•		•			•	•		•	•	•		•	•	•	•	•			•	•	•	•	•
	Conservation of Natural Areas, Culture, and Heritage Sites						•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Regional and Global Conservation		•	•			•		•			•			•										•	•	•
	Buys Everything Local Before Purchasing Abroad			•							•		•												•	•	•
Energy	Uses Renewable Energy	•	•					•	•			•				•		•	•				•	•	•		
	Produced Renewable Energy on Site	•	•					•	•			•				•		•	•				•	•			
	Uses Passive Heating or Cooling							•	•	•			•					•			•	•	•	•	•		
	Energy Conservation is Practiced	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Energy Consience/Efficient Design	•							•	•															•		
Water	Collects Rainwater on Site								•	•	•	•												•	•	•	•
	Sustainable Natural Sources (If Applicable)						•		•						•				•								
	Uses Water Conservation	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Uses Low Flow Facets and/or Showers	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Practices Desalination			•						•					•												
	Has on Site Water Cistern								•	•	•				•									•	•	•	•
Solid and Liquid Waste	Recycles where Possible		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Reuses where Possible	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Reduces Trash	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Recycles Grey Water	•	•					•	•	•			•	•	•		•		•				•			•	
	Treats Black Water on Site	•						•					•	•	•		•		•							•	
	Composting of Organic Waste	•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Air Quality, Light, and Noise Control	Minimization of Pollutant Emissions	•		•	•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•	•	•
	Minimize/Eliminate Building and Transportation Pollution				•		•			•		•					•	•			•	•		•			
	Dark Sky Policy																										•
	Natural Quiet Policy	•			•	•	•	•	•	•	•	•	•	•	•	•	•				•				•	•	•
Resource Conservation	Use Recycled Products	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Use 100% Biodegradable Cleaning Products	•	•			•		•	•	•					•	•	•	•			•	•		•	•	•	
	100% Organic Farming Methods	•							•				•	•	•									•			
	Reuse Building Materials											•	•														
	Protection/Education of Flora and Fuana	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Contribution to the Natural Environment	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Social Commitment	Contribute to Local Community	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•
	Hire Locals	•	•	•	•				•		•	•	•	•	•			•					•	•		•	•
	Works with Local Community	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•
	Culture Conservation	•	•		•		•	•	•	•	•	•	•	•	•	•		•						•	•	•	•
Ecosystem and Conservation Management	Education of Guests and Staff	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Materials and Design	Sources from Sustainably Managed Renewable Resources	•			•																	•			•		
	Sustainable Materials Resourced Locally Wherever Possible																					•			•		
	Recycled Materials Have Been Used	•			•		•						•									•			•		
	No Treated Materials Have Been Used																								•		
	Design based on Cultural Architecture				•								•														

Table 4.1 Overall Case Study Report Card of Ecotourism Criteria

This table shows the systems and environmental strategies employed by 25 eco resorts. We can see that most eco resorts don't use the sustainable building strategies. They employ other types of sustainable strategies. This table was made done by Dominic Iacobucci in his research of eco resorts.

Glossary of Key Terms

Glossary of Key Terms

Artifact- something created by humans usually for a practical purpose (merriam-webster.com)

Caribbean- Tropical islands in the Caribbean sea

Crtical regionalism Movement in reaction to modernisms feeling of placelessnes, looking to provide regional characteristics in architecture in a critical way.

Adventure tourism A form of nature-based tourism that incorporates an element of higher levels of physical exertion, and the need for specialized skill. (ties 3)

Didactic designed or intended to teach (merriam-webster.com)

Eco tourism Can be define as: responsible travel to fragile, pristine, and usually protected areas that strives to be low impact (Iacobucci13). Ecotourism intends to educate the tourist and generate funding for ecological conservation. (merriam-webster.com)

Eco Resort a place composed of small dwellings for relaxation and recreation

Eco lodge low impact sustainable small dwelling for shot stays.

Ecotourist center Place to get information and motivation for ecotourism

Ecological foot Print impact of humans on ecosystems created by their overuse of land, water, and other natural resources

Genius Loci Spirit of the a place, made up of the Phenomena in that location

Geotourism Tourism that sustains or enhances the geographical character of a place-it environment, heritage, aesthetics, culture, and the well-being of its residents. (ties 3)

Green washing deceptive use of the term green or eco, (merriam-webster.com)

Mass tourism- Large scale tourism, typically associated with 'sea, sand, sun' resorts and characteristics such as transnational ownership, minimal direct economic benefit to destination communities, seasonality, and package tours. (ties 3)

Meaning- what is intended to be, or actually is, expressed or indicated; signification; import: the three meanings of a word; the end, purpose, or significance of something. (merriam-webster.com)

Nature-based tourism Any form of tourism that relies primarily on the natural environment for its attractions or settings. (ties 3)

Perceive to recognize, discern, envision, or understand

Perception the act of Perceiving, the act or faculty of apprehending by means of the senses

Phenomena a fact, occurrence, or circumstance observed or observable, (merriam-webster.com)

Phenomenology is a philosophical movement that studies how we perceive phenomena. (merriam-webster.com)

Pro-poor tourism Tourism that results in increased net benefit for the poor people. (ties 3)

Responsible tourism Tourism that maximizes the benefits to local communities, minimizes negative social or environmental impacts, and helps local people conserve fragile cultures, habitats, and species. (ties 3)

Sustainable Tourism Tourism that meets the needs of present tourist and host regions while protecting and enhancing opportunities for the future. (ties 3)

Senses input capacity organisms have for acquiring perceptions. These can be hearing, tasting, seeing, touching and smelling.

Teach to cause to know something, a : to cause to know something <taught them a trade>
to cause to know how <is teaching me to drive>
to accustom to some action or attitude <teach students to think for themselves>
to cause to know the disagreeable consequences of some action <I'll teach you to come home late>
to guide the studies of
to impart the knowledge of

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