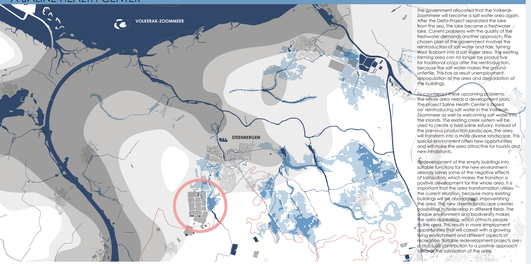
# Saline Experience

## A SALINE HEALTH CENTER




The government allocated that the Volkerak-Zoommeer will become a salt water area again. After the Delta-Project separated the lake from the sea, the lake became a freshwater lake. Current problems with the quality of the water and the surrounding environment made the chosen part of the government involved the reintroduction of salt water and tide, farming and nature. Since the 1990's the Dutch salt farming area can no longer be productive for traditional crops after the reintroduction, because the salt water makes the grafond unfertile. This has as result unemployment, depopulation of the area and the degradation of the buildings.

As a consequence of upcoming problems, the whole area needs a development plan. The project Saline Health Center is based on reintroducing salt water in the Volkerak-Zoommeer as well as welcoming salt water into the Dutch salt farming area, which was used to create a Tidal saline estuary. Instead of the previous production landscape, the area will become a place for tourism and leisure. The special environment offers new opportunities and will make the area attractive for tourists and new inhabitants.

Redevelopment of the empty buildings into suitable functions for the new environment already solves some of the negative effects of depopulation. Because of the positive development for the whole area, it is important that the area transformation utilises the current situation, because many existing buildings will be abandoned, impoverishing the area. The Saline Health Center contributes to revitalising Zuidwestelijk in different fields. The unique environment and biodiversity makes the area attractive for tourists and inhabitants of the region. This results in more employment opportunities that will coexist with a growing living environment and different aspects of recreation. Suitable redevelopment projects are: Sluiskil, Terneuzen, Hoek van Holland, approach channel in Lobstadam of the ports.

## SALT AS MEDICAL STRENGTH

Salt is often viewed as something negative or harmful, mainly because of the negative effects it is associated with high blood pressure and other negative effects on human health, but salt itself is not the cause of these negative effects. Salt has the negative effects on human health, one commonly speaks of industrial salt. Natural salt, such as sea salt, is in fact very beneficial to the human health. Instead of the chemical additives found in industrial salt, it contains trace minerals as phosphorus, magnesium, iron, zinc, copper, selenium, potassium and iodine. The importance of sea salt was discovered by the French scientist Rene Quinton (1866-1925). He discovered that the mineral composition of the sea corresponds to that of the human blood. Quinton's treatments with sea salt led often to a cure of the patient. Sea salt has also the effects of sea salt on the human body. One of the conclusions is that sea salt can relieve inflammations and pain and that it can result in a reduction of medical complaints in multiple areas. In time, the medical world increases its use of synthetic drugs and the use of natural treatments diminished.

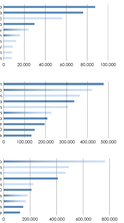
Salt can be used to reduce effect of several diseases. For sea salt to have its effect on the human body, it must be absorbed by the skin into the human body. Oral consumption is the most common way to absorb medicine, but is not the most effective way. Studies show that factors like other types of food, medicines and certain diseases can interfere with absorption of salt through the digestive system. Absorption of salt is through the skin, which can be achieved by taking a salt bath. Another possible means is by using a salt lamp. Inhaling the vapor of the salt is a more direct solution for lung related discomforts. These kind of facilities are very similar to common wellness facilities. The combination of the traditional wellness element and the medical wellness element is a complete treatment plan complete. By facilitating this natural way of treatment in a saline based environment, the use of natural medicine and salt baths are promoted on a bigger scale.

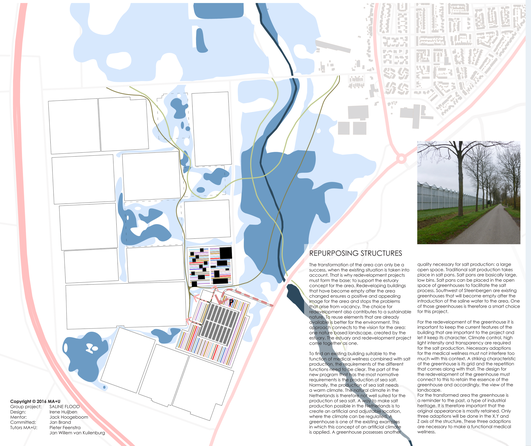
To ensure the medical wellness center produces its own supply of medicinal sea salt, the wellness center includes a salt production facility. The combination integrates the production cycle into the health facility, making it self-supporting. The production process is visible through the new production facilities in the landscape. The character of the production landscape is retained and used to create a positive contribution to the area's reputation. The production of sea salt is more complex than is necessary for the medical wellness itself. The remaining sea salt will be sold in the health center or in other wellness centers in the area. In this way all obtained medical sea salt will be used to spread the healing powers over a larger area.

**NATURAL SALT** VS **INDUSTRIAL SALT**

| NaCl | | NaCl |
|---|---|---|
| on average of 98 % Celtic sea salt = 90% | | 99.99 % |
| 2 % - 5 trace minerals - on average of 80 trace elements | | + chemical additives (anti-caking agent or other chemical additives) |
| The mineral composition of the sea corresponds to that of the human blood. | | * Sodium sulfaat magnesium<br>* Chemical additives → deficiency of both minerals high blood pressure and other side effects |

**MOST COMMON DISEASES BY AGE GROUP AND INFLUENCE OF SEA SALT TREATMENT**



## REPURPOSING STRUCTURES

The transformation of the area can only be a success, when the existing situation is taken into account. That is why redevelopment projects must form the basis to support the estuary development. The many empty buildings that have become empty after the area changed ensures a positive and appealing "Brownfield" development. Instead of problems arising from vacancy, the choice for the redevelopment idea contributes to a sustainable solution. To reuse elements that are already available is better for the environment. This ensures that the Saline Health Center becomes a place-based landscape, created by the estuary. The estuary and redevelopment project come together as one.

To find an existing building suitable to the functions of a medical wellness combined with salt production, the requirements of the different parts of the program. The salt production is a new program, meaning the most normative requirements is the production of sea salt. Because of the climate, salt production takes place in warm climates. The Dutch climate in the Netherlands is therefore not well suited for the production of sea salt. A factor make salt production possible in the Netherlands is to create a climate that is similar to the climate where the climate can be regulated. The greenhouse is one of the existing examples in which this concept of an artificial climate is applied. A greenhouse possesses another quality necessary for salt production: a large open space. Traditional salt production takes place in salt pans. Salt pans are basically large low bins. Salt pans can be placed in the open air, which is necessary for the salt production process. Southwest of Steenbergen are existing greenhouses that will become empty after the transformation of the saline water to the area. One of those greenhouses is therefore a smart choice for this project.

For the redevelopment of the greenhouse it is important that the character of the existing building that are important to the project and let it keep its character. Climate control, high ceilings and open spaces are important aspects for the salt production. Necessary adaptations for the medical wellness must not interfere too much with this context. A striking characteristic of the greenhouse is its grid and the repetition of the structure. The grid is important for the redevelopment of the greenhouse must connect to this to retain the essence of the greenhouse and accordingly, the view of the landscape.

For the transformed area the greenhouse is a reminder to the past, a type of industrial heritage. It is therefore important that the existing structure is retained as much as only three adaptations will be done in the X,Y and Z axis of the structure. These three adaptations are necessary to make a functional medical wellness.

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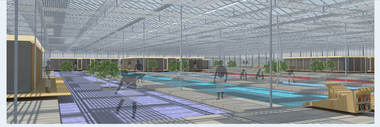
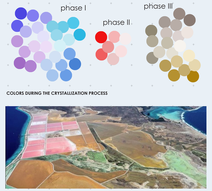


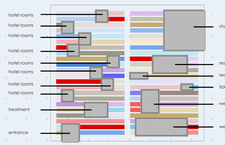


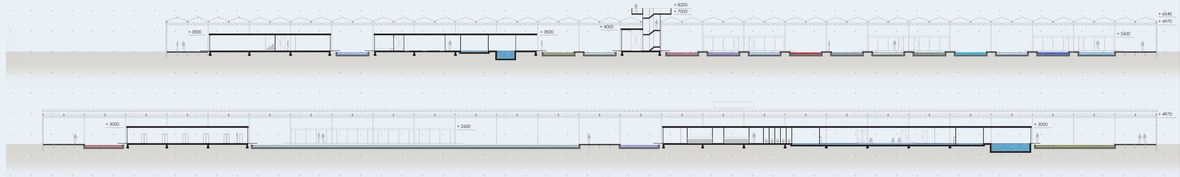

## THE HEALING POWERS OF COLOR

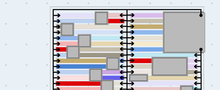
Research shows that colors have a positive impact on people, in particular on people having health issues. More and more hospitals are aware of the healing powers of the spectrum of cleite while to positively influence their patients. The importance of color for recovery underlines the importance of color in the design for the medical wellness.

The salt production in the salt pans connects naturally to the desired color use. Depending on the salinity of the salt from sea water to sea salt, the water color changes many times during this process due to a biological process by microorganisms. Microorganisms (Bacegoa, Dunaliella Salina and Halobacteria) are used in the salt production process to create the right conditions so that crystallization can take place. This biological process ensures that the water color changes of bright colors, which ensures an intriguing and dynamic environment. The many colors in the salt pans are similar to the Dutch Tulip Festival of flowers, a renowned Dutch attraction. The similarities between the two make it possible that the color fields of the salt pans alone will attract visitors to the Saline Health Center.

The color pallet of the crystallization process is very diverse, enabling it to be merged smoothly into the design. Because the salt pan positions are very similar except for its color, each pan position function is designed with a unique color in the salt pan pallet, which has a positive effect on the visitors. Because each function has its own color, it ensures a clear recognition. The choice for the changing colors of the salt pans and the matching colors of the pavilions results in a connected and peaceful environment for the visitors.



## INTEGRATING CLIMATE

All aspects of the design support each other and ensure a clear design concept. Each aspect contributes to the principles and concept. The necessary installations are an important part of the design because they ensure the artificial climate required for this program. Without any installation, the glass enclosure of the greenhouses will ensure very high, unlivable temperatures during the summer. So regulating the climate is an important and necessary design aspect for the redevelopment. This will be achieved using three aspects:

1 The existing structure and the climate installation parts will be retained, so that the re-use of the greenhouse is maximised. The existing structure contains opening windows in the roof, in order to let the heat out. These will be retained and used.

2 The idea of replaceable cloths to keep the sunlight out is applied in a way that it fits the design. The cloths are a kind of screens, which are placed between the beams to ensure the heat stays at the upper part of the greenhouse. For a dynamic effect the screens are movable in different directions, suitable to the sun position. The screens are placed in groups. The screens are placed in functional groups. In those groups are multiple groups for diversity. The placement of the screens in the different main groups are based on the heat need of the functions underneath.

3 New installation techniques are used to improve the heat balance. The application of heat pumps ensures a cooling effect in the summer and re-use the heat for the swimming pools and the temperature level during winter. The heat pumps are placed in the greenhouse. In this whole idea, what makes the salt production not be bound by seasons. The solar collectors are part of the heat pump. The solar tubes cover a large distance in the greenhouse to ensure a cold flow through the tubes so that the energy level is absorbed. These tubes are placed in a repeating pattern in the upper part of the greenhouse, which is alternated with the screens and lamps. The lamps ensure a artificial climate required for this program. Without any installation, the glass enclosure of the greenhouses will ensure very high, unlivable temperatures during the summer. So regulating the climate is an important and necessary design aspect for the redevelopment. This will be achieved using three aspects:

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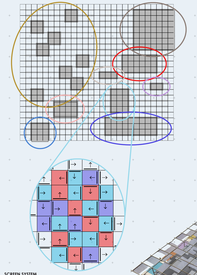
The screens, tubes and solar cells are part of the installation concept, but the way they are used ensures that the installations become them become part of the overall design. The patterns they create give them aesthetic value, matching the grid character of the greenhouse.

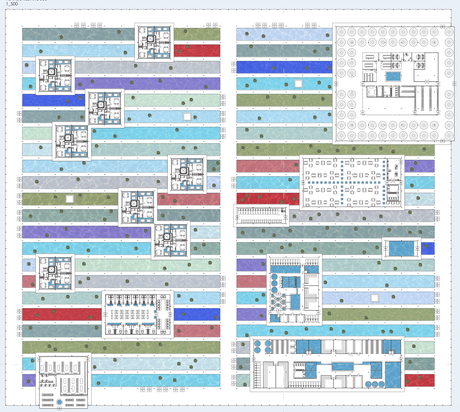
The ventilation of all the pavilions will be done through one installation position. The inside climate of this pavilion is equal to the outside, so the ventilation system is placed on the roof as ok. The central position of this pavilion reduces the distance of the ventilation ducts to the pavilions. Because of this central position, this approach makes an almost invisible ventilation system, what causes the appearance of independent pavilions. In addition to the use of independent element, the pavilion is also used as a place for storage of the equipment needs to cool down after a session. Traditionally, the outside space of the wellness is used to cool down. This pavilion ensures that all visitors to have the same experience in a pavilion as inside a greenhouse. In this pavilion there are other functions, which ensures the multi-use of the greenhouse. This also took out over the greenhouse, functions as well as the new estuary landscape. The combination of the installation measures taken will result in an optimal climate for the visitors, which ensures a pleasant climate and contribute to the wellness experience.

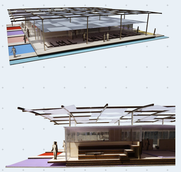


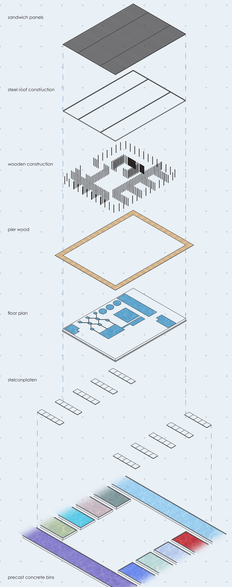
## DIFFERENT WORLDS COLLABORATING

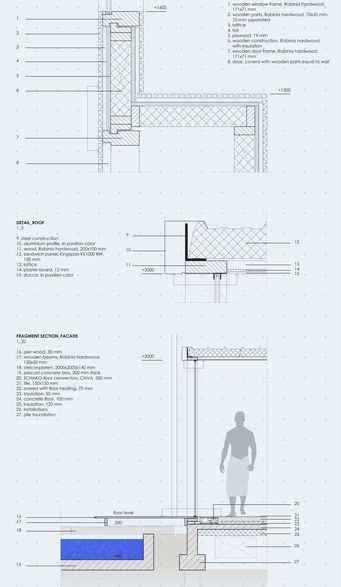
The overall experience of the Saline Health Center consists of three different worlds, connected by the estuary. The estuary connects the visitors to first mental and physical balance. The collaboration between the worlds gives a more complete experience and is therefore of great importance, as both the medical wellness and the estuary are connected to the greenhouse. The two must merge with each other to become a whole. The medical wellness center is connected to the estuary by a sauna and swimming pools. To increase the variation of the center, the wellness center contains different treatment rooms, hotel rooms, a restaurant and a shop to sell medicinal sea salt. The estuary ensures a connection between the different volumes inside the greenhouse creates an intense connection with the surroundings, which ensures a balance between the worlds: the world inside the greenhouse and the world inside the volumes. The use of the medical wellness forces visitors to use both worlds. The connection between the two is reinforced by the different materials used in the volumes, creating different transparent pavilions inside the greenhouse. The two worlds are very different from each other. The existing grid and character of the greenhouse has a strong presence in that world, creating a systematic and mechanical feeling. The grid is not visible in the volumes of the pavilions. The wooden construction and elements create a human and warm feeling. The transparency between the two worlds creates the connecting link.

The third world, the estuary, is also linked by means of a transparent connection: the existing grid of the greenhouse. The sea water around the greenhouse is part of the wellness experience by the application of new tide and hike routes through the estuary landscape. The inspiration to use outdoor facilities for the wellness experience is based on the Scandinavian wellness culture. This culture makes nature itself become part of the healing process. Being in nature has a positive effect and improve people's health and state of mind. Another activity that contributes to the wellness experience is harvesting of sea salt. The traditional way to harvesting sea salt is relaxing and healthy. The estuary and the greenhouse are connected to the medical wellness, again reinforcing the concept of one health center for a complete wellness experience.

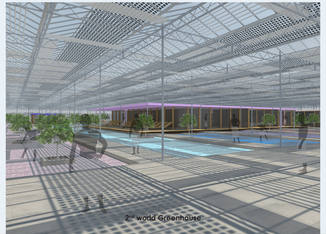
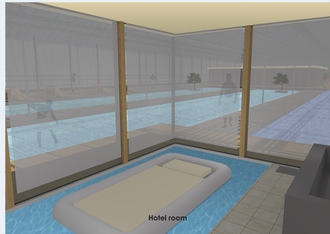









## SUMMARY

*Redevelopment of the West Brabant area is a merger of the known and the to be. A once thriving agricultural area does not have to lay in waste due to a new allocation plan. The landscape will change after the redevelopment, but the character of the area will stay. The existing greenhouses to be implemented into a new wellness center. A center that uses the new techniques for salt winning while at the same time creating a place for people. A place where the old and the new come together to see not only relaxing but healthy, view of an explosion of colors due to the biological process of the salt winning and outside activities due to the luxuri of the infrastructure of the estuary. Transparent enclosures within the buildings allows one to be conscious of the newly added supplements and the original structure. Visitors will be able to experience the old, the now and one wishes in this new found "world". A world where the estuary, greenhouses and pavilions merge together to work as one entity for their wellness experience. The Saline Health Center is a redevelopment project which contribute and strengthens a positive approach to the transition of the area.*