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# Conceptual development for the design proposal of the botanical garden of the academic unit of agrohydraulic in San Juan Acateno, municipality of Teziutlán, Puebla

# Desarrollo conceptual para la propuesta de diseño del jardín botánico de la unidad académica de agrohidráulica en San Juan Acateno, municipio de Teziutlán, Puebla

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**Abstract**

The project and construction of the Agrohydraulic Botanical Garden, the Benemérita Universidad Autónoma de Puebla (BUAP) in San Juan Acateno, in the municipality of Teziutlán, was developed in collaboration with teachers from the Faculty of Agrohydraulic and the Faculty of Architecture of BUAP, as well as undergraduate students, social service and professional practice of architecture schools, graphic design Urbanism. The botanical garden project is located in the reserve category, to protect species of medicinal, ornamental, tingling and regional interest and thematic level of species of interest, to disseminate botanical knowledge of the region. The development of the project was based on qualitative research, interested in capturing the reality of users to determine the needs to be solved; in this process the designer applies the knowledge he develops in vocational training and induces the characteristics and conditions of the study problem. All this is done through different techniques and research tools such as interview, systematic observation, topographic survey, as well as the climatic conditions of the place, topography and conditions of existing buildings contrasting with documentary research.

**Project, Intervention, Development**

**Resumen**

El proyecto y construcción del jardín botánico de Agrohidráulica, de la Benemérita Universidad Autónoma de Puebla (BUAP) en San Juan Acateno, del municipio de Teziutlán, fue desarrollado en colaboración de docentes de la Facultad de Agrohidráulica y la Facultad de arquitectura de la BUAP, así como de alumnos de licenciatura, servicio social y práctica profesional de los colegios de arquitectura, diseño gráfico, urbanismo. El proyecto del jardín botánico está ubicado en la categoría de reserva, para proteger especies de interés medicinal, ornamental, tintóreo y regional y de nivel temático de especies de interés, para difundir el conocimiento botánico de la región. El desarrollo del proyecto se apoyó en la investigación cualitativa, interesada en captar la realidad de los usuarios para determinar las necesidades a resolver; en este proceso el diseñador aplica los conocimientos que desarrolla en la formación profesional e induce las características y condiciones del problema de estudio. Todo esto se realiza por medio de diferentes técnicas e instrumentos de investigación como la entrevista, la observación sistemática, el levantamiento topográfico, así como las condiciones climatológicas del lugar, la topografía y las condiciones de los edificios existentes contrastando con la investigación documental.

**Proyecto, Intervención, Desarrollo**

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## Introduction

Botanical gardens have been defined as spaces that allow recreation, which can have a recreational, thematic and educational purpose; These areas are developed according to the type of collections they house. These flora collections are used for the development of scientific research, education and conservation, which in turn have the function of conserving natural heritage and promoting agriculture, protecting the different species. In a country that has around 18,000 species, therefore, conserving the natural heritage is a priority of the Mexican government and universities. For all the above, the Benemérita Autonomous University of Puebla recognized the need to promote the teaching and conservation of species and created in Teziutlán, Puebla the botanical garden at the agrohydraulic school. The Teziutlán Botanical Garden, has as its main objective, to safeguard the species of economic and sociocultural interest in the northern region of the State of Puebla and to protect the species of great importance for daily life and endemic species for the development of science and that they are part of the culture of the region. The municipality of Teziutlán is a word that comes from Nahuatl and means: place where it hails, it is located in the northwestern part of the state of Puebla. In this transition zone of temperate climates of the northern highlands and warm climates of the decline of the Gulf of Mexico. Teziutlán is located in large wooded areas where trees such as ocote, oak, red pine, sweetgum, pear, avocado and peach trees stand out. Teziutlán, being a strategic point in the region, at the beginning of the 1980s, the first buildings of BUAP's Faculty of Agrohydraulic Engineering were installed, located at Avenida Universidad s / n, San Juan Acateno, Teziutlán, Puebla, postal code is 73693.

The garden project was developed as a cultural complex with a regional ethnobotanical Botanical Garden in whose design teachers and students participated in response to the needs of the Faculty of Agrohydraulics, supported by the programs of social service and professional practices of the Faculty of Architecture of the BUAP.

For the project, spaces for research, education, culture, recreation, commerce and scientific collections, main, secondary and service accesses were considered; visitor, employee and vendor parking; self-sustaining infrastructure for research, educational spaces for induction in research and educational management, spaces for culture, for recreation and open spaces for the benefit of recreation and leisure. This last space is the one that was analyzed because it is an area that starts from the concept of design in current botanical gardens where it focuses on functional and geometric design that solve the needs arisen in the user's analysis process. The project is of conservation to maintain alive specimens of interest of the regional flora; exhibition, propagation, research, education, Recreation and rest, reception to the public, access and lobbies, spaces for complementary services such as ticket office and information, area for dissemination of knowledge, service area.

## Project conditions

With this research and design project, the area destined for the Agrohydraulic area was recovered, to reforest and restore the areas surrounding the building, considering legal, cultural and architectural aspects in the solution to the problem. The work was supported by students of social service and professional practices, who participated in the development of the project; It was an integration project that benefited the institution, students from different academic units, and the surrounding populations. On the other hand, the project allowed the development of works to extend the knowledge acquired in congresses, forums, undergraduate and graduate conferences of our institution and other universities; as well as the inclusion of Ethnographic and Permaculture aspects in undergraduate and graduate thesis projects, promoting heritage conservation.

The objectives agreed with the School of Agrohydraulics were met, which are:

Promote the study, use and conservation of regional ethnobotanical flora, as well as associated traditional knowledge.

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Develop the comprehensive architectural and landscape design of the Botanical Garden, with the support of the BUAP Faculty of Architecture.

Achieve the unification of the Botanical Garden project with the existing infrastructure of the Faculty of Agrohydraulic Engineering such as orchid gardens, nursery, vermicompost area, hydroponic crops and greenhouses, among others.

Establish itself as a regional center for the conservation, promotion and sustained use of the biodiversity of the northeastern region of the State of Puebla.

Promote the study and use of renewable resources in the construction of the Botanical Garden by implementing ecological technologies (enotechnics) typical of the region.

As for the project, it has allowed the integral development between the building and the environment, as well as the incorporation of technologies for the capture of water, because despite being an area where there is a strong rainfall, for a long time they lacked water service; The monitoring and supervision of the construction of the buildings and their facilities was also carried out, as well as the garden with walkways, covered paths, areas according to the types of species, the facilities and the signage developed by the graphic design students.

The project also helped to strengthen one of the areas, where there are the most vulnerable ecosystems in Puebla, which are the Mesophilic mountain forests in the northern Sierra, and to conserve the native flora of the region, as well as to allow Agrohydraulics students obtain study spaces and practices that allow them to obtain a development related to the precepts and objectives of the MUM. Meanwhile, the project allowed the participation of farmers to expose the students to the treatment of the species and their production to improve the characteristics of the vegetation.

It was a multidisciplinary work, where everyone involved in the problem was incorporated to provide a solution according to the needs of the users; resulting in an architectural project, landscape project, in support of the community most affected by the destruction of native flora. The conservation of the biodiversity of the place was achieved through the location of the buildings and cultivation areas, since we found eroded areas, where it was decided to locate the construction area and in the area with cultivation possibilities, the garden was placed, as well as the selection of the species that had the best possibilities to develop. The guiding idea of the flower was established, the topography of the land, the construction regulations, the botanical garden regulations and, above all, the participation of the students were considered.

The development of the research project yields the following results according to the architectural design proposal.

Regarding the project and in accordance with the analysis of the urban context, the main areas of architectural domain and growth were located, adapting the modifications of the proposed projects, proposing the primary flower as a space in which the main views would benefit, achieving perspectives of urban enhancement that contributes to the growth, profit and improvement of the faculty both internally and externally.

After carrying out the contextual analysis of the location and updating of the physical space of the FIAH, we have evoked the proposal of creating a new zoning in which the different spaces required for this project are located in which they can be justified and adapted from Correctly shape the buildings and planting areas of the species. The area where the new Flower is assigned is recovered, where the plant species can be shown, as well as the reforestation areas in the surrounding areas as a proposal for the improvement of the area in vegetative and bioclimatic issues, considering the normative aspects in the management of the form and protection of endangered species, in which the quality of life of its inhabitants is integrated as students and visitors in the solution to the sustained problem.

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A first proposal is achieved for the administrative areas, which integrate cubicles to support research, teaching and maintenance of the "Flower" area and spaces that cover the research shelter of the Botanical Garden, restrooms and observation areas through another cultural building with sheltered warehouses, spaces for the diffusion of culture and knowledge connected through the terraces that promote the predominant and pleasant views of the surrounding landscape and the delimiting of the flower as the primary view of the project and of those derived from the project . As well as its contextual integration in the future growth of the needs of the faculty.

**Areas of Intervention**

The different areas were analyzed in the whole of the Faculty of Agrihudráulica, and of the main area as designated for intervention for the improvement proposal towards the design and distribution of planting of the various species in order to give a useful use, to the spaces designated for the performance of students and people interested in the field of botanical species. This space, they adhere to the guiding idea of representing an icon and image for the faculty, with a diverse sample of species from the region, native plants and their benefits in different uses.

This area has fields, production areas, fruit trees, conservation and reinsurance of the care of native plants: ornamental, medicinal, tinctorial and fruit plants.

Its condition was not optimal for the imminent intervention of the site; Before carrying out a detailed analysis of the needs in infrastructure, equipment or complementary services, which together receive a new architectural design proposal; and thus, cover all your requirements. All because of the lack of maintenance, a lack of planning in development - the growth of the faculty, as well as the a priori intervention of man.

The deterioration due to the lack of the necessary care due to an erroneous intervention, product of the lack of coordination - experience in the biological and botanical field is exposed.


**Figure 1** FIHA Complex Plan Area of intervention
*Source: (Ilustration. S.S. FABUAP 2016 students) (2016)*

**Figura 2** Species area, Botanical Garden
*Source: (Photo: Alumnos S.S. and P.P. FABUAP, 2016)*

**Figure 3** Sowing area, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

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**Figure 4** Access to the Sowing Area, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

## Classroom area

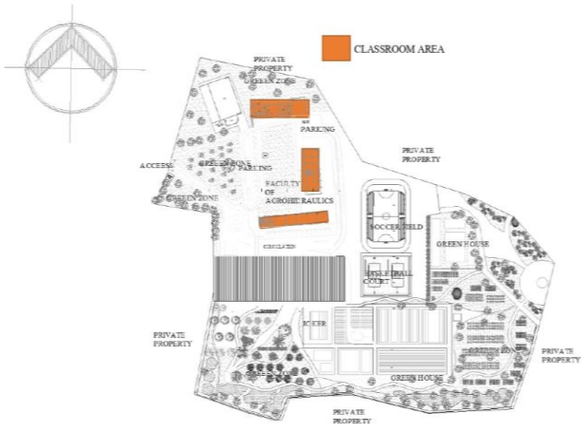


**Figure 5** Aréa de Aúlas, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

There are three buildings where the teaching of the Agrohydraulic engineering career takes place. The rectangular buildings are connected by means of a central corridor that unifies them for a single distribution and access.

Building A has a teachers' lounge, multipurpose room, restrooms and school classrooms.

Building B, has a library, graduate classrooms, English areas, computer, general and hydraulic laboratories, as well as infrastructure, has special drainage for laboratories, heaters, ventilation and refrigeration. The C has cubicles, general management, warehouse, atomic absorption laboratory and an in vitro propagation culture area.

The connection of the three classroom buildings is through a distribution corridor, along with recreational gardens, as well as furniture and lighting.

## Exhibition area


**Figure 6** Auditorium Area, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

The auditorium of the faculty of agro-hydraulics, intended for presentations and exhibitions, as well as meetings, has toilets and a cafeteria.

## Public areas

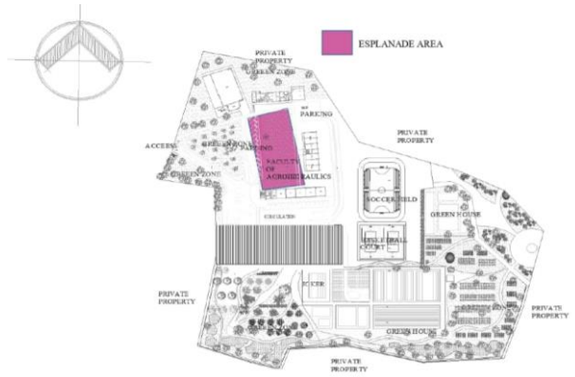


**Figure 7** Esplanade Area, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

Open space for the recreation of students, field practices, crops and crops of ornamental plants, space for the meteorological service and its analysis.

**Production and plantation areas**

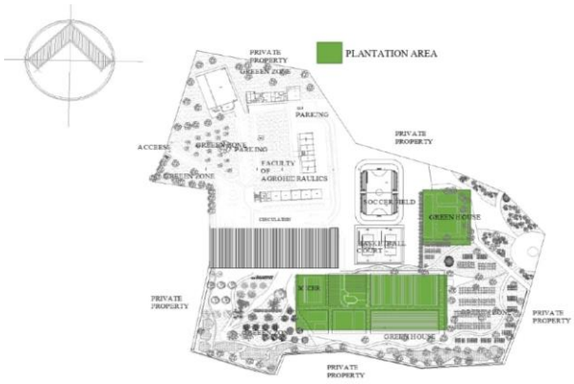


**Figure 8** Greenhouses and Crops Zone, Botanical Garden
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016)*

Open space for the multiplicity, care, reserve and planting of native species; has the facilities and services necessary for the care and maintenance for production of new species.

**Leisure and sports promotion area**

Free space designed to promote sports activity within the campus, divided into sports such as soccer and basketball.

**Territorial reserve space**

Natural reserve area, where there is little intervention, intended for production, this lack of intervention is caused by the topographic conditions of the land. It has a minimum space for the multiplicity of ornamental plants for planting and care, although with a specific maintenance a greater area of use of this sector could be achieved.

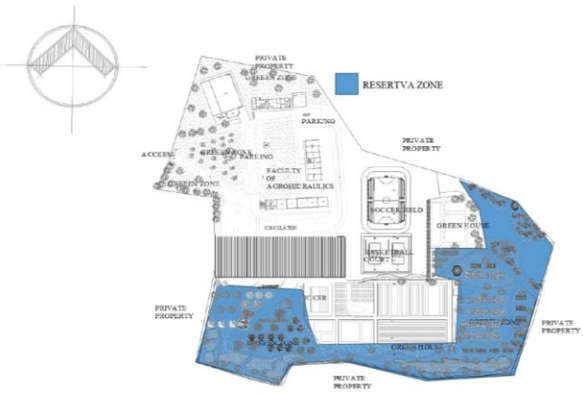


**Figure 10** Resertva Zone, Botanical Garden.
*Suource: (Photo: Students S.S. and P.P. FABUAP, 2016)*

Analysis, for the development and proposal of architectural design.

- The deterioration of the mentioned areas is exposed, due to the lack of planning and development; of the necessary care in maintenance, due to an erroneous intervention, product of the lack of experience in the design and programming of the biological and botanical activities.

- The access avenues lack regulatory measures in garrisons, sidewalks and streets in accesses or connections. Affecting vehicular circulation; because the street is very narrow allowing access to a car or truck in each direction. In addition to the lack of parking areas and space for visits to the different areas for the garden proposal.

- It shows the deterioration of the old botanical garden where it is proposed to carry out the intervention of the same, improving the current affectations in circulation since they are organic designs, not well carried out, lacking a good distribution and organization in classification of the species.

- The lack of design and style in the execution of roads and circulations is observed; due to deterioration; Lack of care to the area due to the growth of the plants in increasing causing a visual loss of the original photo.

- Limited space for the growth of cacti plants, the constant growth in the number of these species has caused the loss of organization and the combination of species that are not of the same genus.

- The growth of the weed is observed causing the loss of null circulations.

- Main vegetable production area, currently destroyed due to poor use of the facilities and lack of maintenance of the faculty and students.

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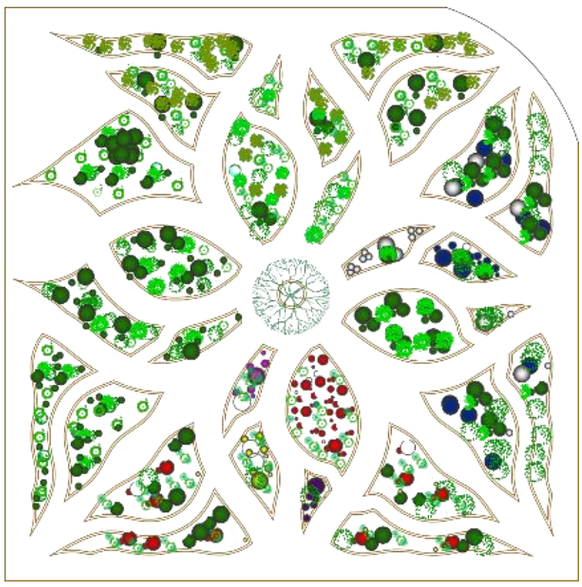
**Figures 11** Zones described in the Botanical Garden.
*Source: (Photo: Students S.S. and P.P. FABUAP, 2016*)

## Conceptualization

Botanical gardens are areas of interest for playful recreation - passive, in thematic designs and educational contribution, for housing valuable collections of flora; with the purpose of doing scientific research, and contributing in the education of the higher level for the FIAH, a support to the conservation of the species of the region. It was proposed to meet the requirements that allow the protection and recognition of endemic species, as well as to identify the climatic characteristics for their development in practical learning ORC ID ctic for the areas of agrohydrahulica.



**Figures 12** First Design Proposal of "La Flor" for the Botanical Garden
*Source: (Student Illustration S.S. 2017)*

At the beginning, a representation in a figure is proposed, which illustrates the first design proposal of the conceptual distribution of for plant species in the Botanical Garden. It is a visibly attractive flower due to the soft forms and the sinuous handling, but in the absence of a formal study. It was applied poorly in the facilities, without having exact measurements; that would allow to assign or group the species appropriately, so a rethinking is continued, in order to improve the conditions.

It is proposed to list actions that organize the activities for the design and conceptualization of the designs, from different elements in serial analysis through successive plans, which justify the forms, of the concept that is the basis for the project.

Taking the 4 basic species: Ornamental, dye, Medicinal and Fruit, as the main base of the studied plant species, in the distribution of the proposal for the new design.

The ethnobotanical species that directs this study is assigned to the dyer, as the representative axis of the region in the regional embroidery and the crafts of its communities; in the Teziutlán area, as a living example of the conservation of the species that dye the threads that are used for these crafts; as well as the vegetal representation of flowers with a varied catalog of species. Thus, a "wild dahlia" is assigned as the design basis for formulating the design.

Determined from the contextual analysis of the physical space of the FIAH, the proposal to create a new zoning will be enunciated in which the different spaces that house the four species are located, adapting them correctly. From the guiding elements of the "Dalia", the geometric shapes in lines and various designs of the pentagonal shapes will be attributed as guiding elements for the generation, location and relationship between the spaces. When locating the zoning, in a spatial relationship by species, classification and adequate dimension.

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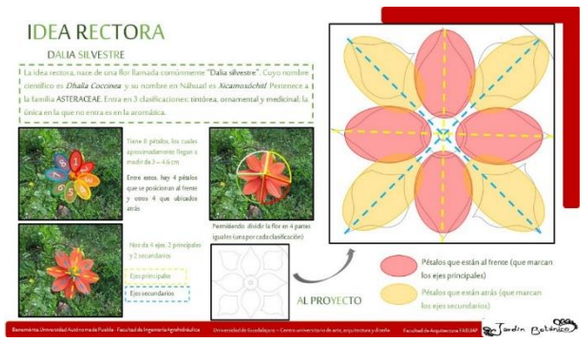
A first proposal is presented in the analysis of attached sheet 1; where a formal decomposition of the flower is made by sub-dividing the petálos; in geometric shapes and strokes; of the 8 leaves the 4 rays are established in equal parts; that will start to assign a section for each classification in 8 parts of the same section. At the center, the radial axis of circulation would be located, which unifies the distribution and thus zoning other sub-areas outside the center.




**Figures 13** Plate 1 Guiding Idea "La Flor Dalia"
*Source: (Students of S.S. and P.P. 2016)*

It is proposed to use another sheet that radially gives a more aesthetic shape to the whole of the "Dalia", choosing a Red Teshuate, they consist of 4 main divisions, which would be located in the radial distribution to receive the external areas and take advantage of the circumstances of the corridors as seen in the following images:

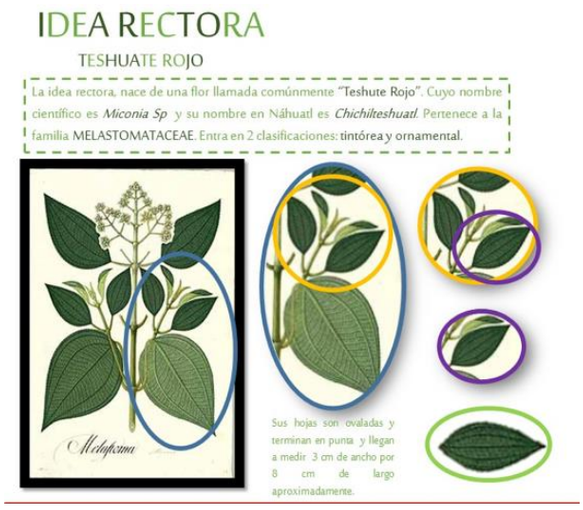



**Figure 14** Lá Mine 2. Guiding Idea "Teshuate"
*Source: (Students of S.S. and P.P. 2017)*

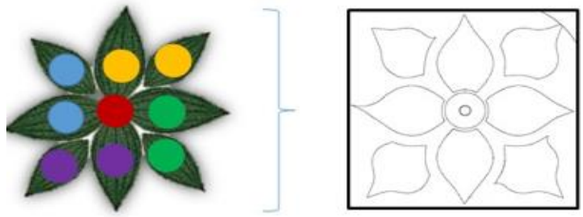


**Figure 15** Plate 3. Guiding Idea "Teshuate"
*Source: (Students of S.S. and P.P. 2017)*

Flower design process: In the process, the measures required for the species and allocation of the zones were determined - with the areas determined for the four species of the garden project, of the corridors in the appropriate dimensions for the circulation of the people in the use, route and maintenance in balance with the guiding idea in not losing its original to the project.

Returning as the beginning the morphology, among its formal characteristics in order to allow free access between the plantations, due to the fact that the dimensions in the new location were smaller than the current dimension of the previous one, appropriate to the size and proportion.

A pentagonal shape containing five petals is assigned primarily; in order to be able to designate radial planes according to the appropriate orientations to the vegetation, and successively assign intermediate spaces to reduce spaces to open new parts to space at regular dimensions in planting or manipulating.

Generation of the formal composition of the flower: It begins by designating a figure inscribed in a circular shape. Starting from a radial center that leads to the pentagonal lines of radioconcentric elements, playing with the composition in fractal shapes, obtaining: crystals that wrap their geometrization towards the flower. Subsequent circles are then generated in the radii to determine rotating sections, thus successively elements that distribute division or union spaces would be generated. Until the final design effect is achieved. As below are shown in the following illustrations described:

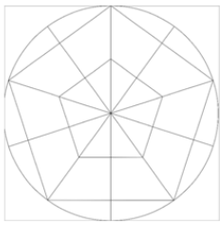


Illustration 1. Geometric stroke of the flower for its compostive axes and according to them raise the distributions in addition to being able to plot the drawing on the digital plane easier.

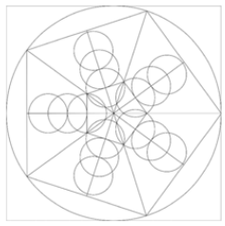


Illustration 2. The circles allowed us to locate the center part of each section so that from them, the arc is drawn or the circle that was subsequently transformed into the petal.

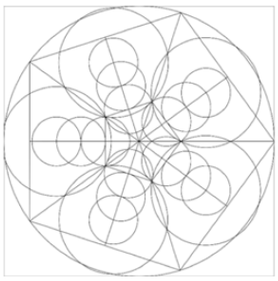


Illustration 3. First stroke of the circles that would form the petals, leaving marked the intersections that would later be the separation between the petals and in our case, the corridors.

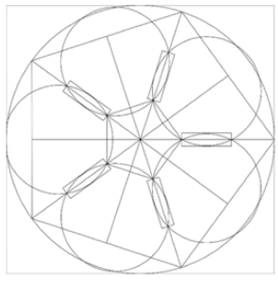


Illustration 4. The previous stroke was cleaned, only small circles. Then we marked the corridors and separation between the petals, the intersections of the large circles gave us the relevant measurements for the projection of each step board.

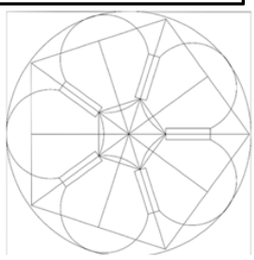


Illustration 5. We draw the petals from the steppes, each vertex of the rectangle would be the starting and ending point of the arches that would give its shape

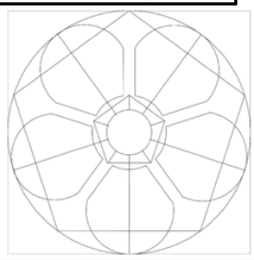


Illustration 6. A center was drawn, which had been proposed to place a tree as a landmark and nodal point in the original design, from this we projected another that you would cut and finish forming the petals, in addition to acting as a "circulation belt". Done these, we erase the leftover strokes to clean the plane.

Successive tests are carried out until the following illustrations are reached:

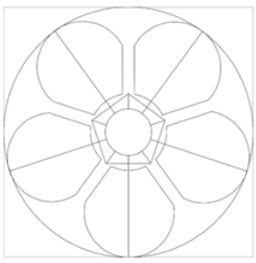


Illustration 7. We continue now to erase the remaining primary strokes, such as the pentagon that initially delimited the shape (the one observed in Figure 1) to leave only the pentagon of the center and the main center axes.

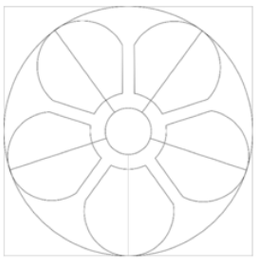


Illustration 8. Completely cleans the flower, along with the center axes

Illustration 9. First planning steps between the petals. It was proposed that between each petal there should be a corridor that would allow us to circulate in and around the garden to make contact with the garden more comfortable and dynamic.

Illustration 10. We decided that a fractal spiral would be the best way to cut the interests, according to it and the corridors we had marked in Figure 9, because even though we had already marked the circulations, how could we better circulate through them?

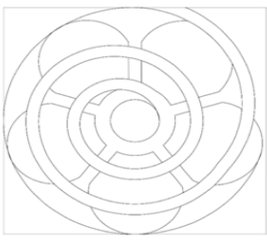


Illustration 11. We remove the basic strokes to clean the path and spiral spasm, but we can't leave it at that, we have to open the spiral to the steps between the petals.

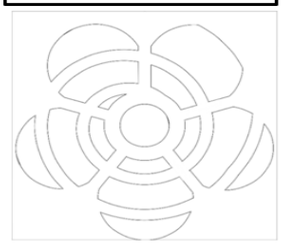


Illustration 13. Clean flower with open steppes and there is a better possibility of circulations. The downside with this proposal is that it greatly reduces the planting space and subtracts us from the exhibition area.

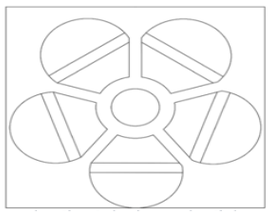


Illustration 14. A second option of circulations was raised, more friendly with the green area that we want to have and without subtracting visitor mobility through the green display. The pentagon in the center was re-designed and climbed until it passed a little higher than the intersection between the petal arch and the spasm and one more passing under it.

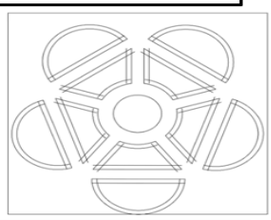


Illustration 15. The limiters were cut to the sides and circulation is free. Offset is the consideration of each gardener's dividing fence. It was first raised at 0.40 meters and then 0.15 meters.

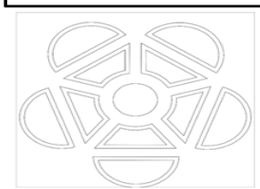


Illustration 16. Erasing the strokes of the limiting bards of 0.40 meters reduces the planting area however we could lose care with the thrust of the earth.

Illustration 17. 0.15cms clean limiting barda. It offers us greater planting area. But we'd have to study the thrust that the gardener's subtractor will have.

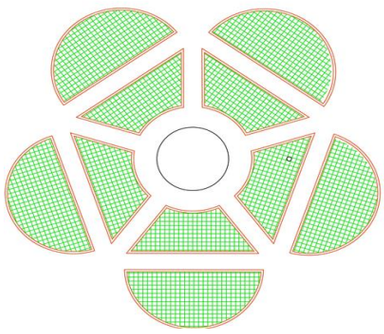


**Illustration 18** Clean flower with planting grid and 0.15 meter delimiting fence

The previous process is the result of the analysis process of graphic drawing in digital software, prior to it in designs to sketches, pertinent until reaching the final proposal that they could see in illustrations 17 and 18. For the illustrations of the spiral line fractal, it was justified that the first idea coincides in important points with the same spiral. For the distribution, some inconveniences had to be resolved on the original structure, which was to adapt its size to the forms of the "Dalia", as a conflict at the beginning, when trying to incorporate the form to the appropriate dimensions, in efficiently distributing the four classifications plants (dyeing, ornamental, fruit and medicinal); Having only five petals, we would have to play with the distribution of the plants, then another question arises to be solved: How can we carry out the organization of the plants so that the sample book and green showcase is the most appropriate for their appreciation.

Two proposals are made, the first one was that in each one of the "petals" a classification of plants should be sown, deepening or widening by putting one of them in two petals, which in this case; It is proposed that it be the dyeing because of the antecedents it has in the region, as it is used as the main one for the handicrafts carried out in Teziutlán. The second proposal is to divide the 5 petals into four equal parts from the center and in each one of them, plant each classification. And mediate the planting areas between the petals in order not to be confused and separate them by: classification, size or growth between one or the other..

**Elaboration of descriptive sheets**

The following descriptive sheets of the listed species were made, as a suggested basic guide, for the allocation of the spaces of the "Flower" design, making the clarification that the study, classification, cataloging of the species; it is part of another study by the FIAH; in the four classifications: medicinal, ornamental and tinctorial, incorporated from 2006 to date. Includes the common name, scientific name, family to which it belongs, brief botanical description, usable part of the plant, place of collection, among others.

| Medicinal plants planted in the JB of the FIAH in 2016 | | | |
|---|---|---|---|
| **No.** | **Family** | **Common name** | **Applications** |
| 1 | Liliaceae (1) | Aloe | Regenerates skin cells |
| 2 | Lips (7) | Horehound, peppermint, rosemary, oregano, thyme, lemon balm, mint. | It helps you lose weight |
| 3 | Umbellifera e (2) | Parsley, green anise. | Combat menstrual disorders |
| 4 | Composite (7) | Cempasúchil, santa maría, chamomile, arnica, dandelion, mullein, master herb | Helps fight cancer, helps indigestion, |
| 5 | Polygonacea e (1) | Cow tongue | Purifies the air we breathe |
| 6 | Rutaceae (1) | Rue | Helps with hemorrhoids |
| 7 | Lythraceae (1) | Hit grass | disinfectant and healing |
| 8 | Lauraceae (1) | Avocado | Nourishes and moisturizes the skin |
| 9 | Nyctaginace ae (1) | Bougainvill ea | Control respiratory conditions |
| 10 | Verbenaceae (1) | Lemongrass | Decrease fever, fight colds |
| 11 | Poleminiace ae (1) | Spinosilla | Prevents hair loss |
| 12 | Myrtaceae (1) | Eucalyptus | Control respiratory conditions |
| 13 | Malvaceae (1) | Mallow | Control respiratory conditions |
| 14 | Caprifoliace ae (1) | Elder | Control respiratory conditions |
| 15 | Chenopodia ceae (3) | Epazote, epazote skunk, spinach | Stomach pain and indigestion, dewormer, liver, gallbladder |
| 16 | Solanaceae (2) | Nightshade, florifundio | Headache |
| 17 | Cactaceae (1) | Nopal | Control intestinal pain |
| 18 | Grasses (1) | Corn hairs | Deflate the kidney |
| 19 | Squares (1) | Horse tail | Improves the circulatory system |
| 20 | Agavaceae (1) | Izote palm | Earache |
| 21 | Cucurbits (1) | Hedgehog leaf | Kidneys pain |
| 22 | Hamamelida ceae (1) | Sweetgum | Regenerates the epidermis |
| 23 | Logania (1) | Tepozan | Helps healing |

**Table 1** Medicinal plants planted in the JB FIAH in 2006, in the region of the Municipality of Teziutlán, Puebla. (Students S.S - P.P. 2017)

| Ornamental plants sown at the JB FIAH in 2006 | | | |
|---|---|---|---|
| **No.** | **Family** | **Common name** | **Applications** |
| 1 | Polipodiaceae (1) | Male fern | Flower arrangements, flower pots |
| 2 | Drypteridaceae (1) | Pezmilla | Flower arrangements |
| 3 | Liliaceae (2) | Bad mother, ducking | Flowerpots, gardens |
| 4 | Composite 2) | Margarita, cempasúchil | Flowerpot, gardens, cut flower |
| 5 | Saxifragacea (2) | Millionaire, hydrangea | Flowerpots, gardens |
| 6 | Araliaceae (2) | Ivy, aralias | Covers walls, gardens, natural barriers, arrangements |
| 7 | Rosaceae (2) | Piracanth, roses | Natural barrier, cut flower, gardens |
| 8 | Cupresaceae (2) | White cedar, Tulia | Natural barrier, Gardens, flowerpots |
| 9 | Araceae (1) | Alcatraz | Cut flower, gardens |
| 10 | Onagráceas (1) | Aretillo | Gardens, flowerpot |
| 11 | Ericaceae (1) | Azalea | Flowerpot, gardens |
| 12 | Purple (1) | Thoughts | Flowerpots, gardens |
| 13 | Nictagináceae (1) | Bougainvillea | Gardens |
| 14 | Iridaceae (1) | Lilies | Gardens |
| 15 | Bromeliads (1) | Bromeliad | Pots |
| 16 | Euphorbiaceae (1) | Good night | Flowerpot, gardens |
| 17 | Cannaceae (1) | Platanillo | Gardens |
| 18 | Buxáceas (1) | Myrtle | Natural barrier |
| 19 | Agavaceae (1) | Yucca | Gardens |
| 20 | Betulaceae (1) | Aile | Natural barrier |
| 21 | Oleaceae (1) | Golden thunder | Natural barrier, gardens |
| 22 | Mytaceas (1) | Swab | Gardens |
| 23 | Hamamelidaceae (1) | Sweetgum | Natural barrier |

**Table 2** Ornamental plants planted in the JB IAH in 2006, in the region of the Municipality of Teziutlán, Puebla. (Students S.S - P.P. 2017)

## Conclusions

In conclusion, it can be stated that the project in its different stages allowed to support the teaching activities of the Faculty of Agrohydraulics and in the dissemination of endemic species and their cultivation to the population that carries out agricultural activities. involved in the problem to provide a solution according to the needs of the users; resulting in an architectural and landscape project and, above all, in support of the community most affected by the destruction of native flora.

The architectural project of the botanical garden is a recreational space fulfilling the purposes for which it was designed that strengthen the development of scientific research, education and the conservation of natural heritage. The Teziutlán Botanical Garden currently complies with safeguarding species of economic and socio-cultural interest in the municipality of Teziutlán. It is an especially useful project for the region and a contribution from the Benemérita Universidad Autónoma de Puebla with the participation of students in all stages of analysis and design, exposing them to real conditions that allowed a greater understanding of the activities of their profession.

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