Revitalization of a leisure space in the Jaboticabal (SP) UNESP campus [1]

EMERSON IOSSI[2], MARIA ESMERALDA SOARES PAYÃO DEMATTÊ[2], LUIZ CARLOS PAVANI[3], JOSÉ EDUARDO PITELLI TURCO[3], JOSÉ LUIZ DACAL SEGUIM[4]

ABSTRACT

The objective of this study was to organize, to report and to comment the information obtained during the elaboration and implementation of a project for revitalization of the square where the main canteen of the Campus of Jaboticabal of UNESP is situated. The results of the project were also evaluated.

Keywords: landscaping, open space, square, garden.

RESUMO

Histórico sobre a revitalização de área de lazer no Campus de Jaboticabal(SP) da UNESP

O objetivo deste trabalho foi organizar, relatar e comentar as informações obtidas no projeto de revitalização da quadra onde se situa a cantina principal do Campus de Jaboticabal da Unesp, elaborado e implantado pelos autores entre 1997 e 1999. Avaliam-se também os resultados do projeto.

Palavras-chave: paisagismo, espaço livre, praça, jardim

1. INTRODUCTION

The gardens of the College of Agricultural and Veterinary Sciences (FCAV) from Jaboticabal Campus of Universidade Estadual Paulista (UNESP) were initially designed by Prof. Dr. Pedro Dantas Fernandes in 1972. In 1975, a canteen designed by Prof. José Assumpção was built in these garden spaces. The place studied in this work was the recreation area of the block where this canteen is situated.

In 1990, Fernando Martinho Castiglioni proposed changes in the building, and his studies served as a subsidy for a redesign done by Henrique Sundfeld Barbin in 1994, which met the most pressing needs for improving the site.

The space, however, still needed many modifications and adaptations of the landscape design. The authors of this study have developed and implemented then, between 1997 and 1999, a project that sought to meet the needs of the users, providing comfort and making the place more pleasant.

Generally, there are few systematic and descriptive notes of the problems encountered in the implementation of landscaping projects and on the proposed solutions. Because of this, important information that could prevent mistakes being repeated in similar situations is lost. The objective of this study was to report the procedures and evaluations carried out during and after the implementation of this new project of the canteen gardens, for registration.

2. GENERAL INFORMATION ABOUT THE PROJECT

The climate of the region, according to Köppen, is Aw with transition to Cwa; it is characterized as subtropical, mesothermal, with dry winter and rainy summer.

The canteen's block soil is a dark red latosol with clayed texture and dystrophic (ALOISI e DEMATTÊ, 1974). Recommendations for plant fertilization were based on simple chemical analysis of soil.

To assess the needs and expectations of the users concerning the revitalization, a survey was carried out through the whole community of FCAV (teachers, students and servers), which consisted of the design exhibition accompanied by a suggestion box.

The main suggestions were: to make a channel around the canteen because, in the situation it was in, the water invaded the building during the rainy season; to substitute the damaged the wood seats; to repair the lawn; to remove the mud accumulated mainly near the canteen; paving the way open by trampling among the living quarters of the Agricultural Technician School (CTA) and the classroom buildings; to maintain and to diversity the colors of the existing vegetation.

The planialtimetric cadastral survey was updated, being this essential to plan the land movement where it has occurred laminate and shallow grooves erosion, and to plan a drainage system for the water from roofs.

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(2) Universidade Estadual Paulista (UNESP), FCAV, Departamento de Produção Vegetal, Jaboticabal-SP, Brazil.

*Corresponding author: emersonpaisagismo@terra.com.br

(3) Universidade Estadual Paulista (UNESP), FCAV, Departamento de Engenharia Rural, Jaboticabal-SP, Brazil.

(4) Universidade Estadual Paulista (UNESP), FCAV, Departamento de Fitossanidade, Jaboticabal-SP, Brazil.

It also updated the survey of the species in the study area, developing a plan in the scale 1:200. The survey of the species was remade, developing a plan in the scale 1:200.

We opted for the organization of the available space taking advantage of existing features and introducing new elements (Figures 1 and 2).

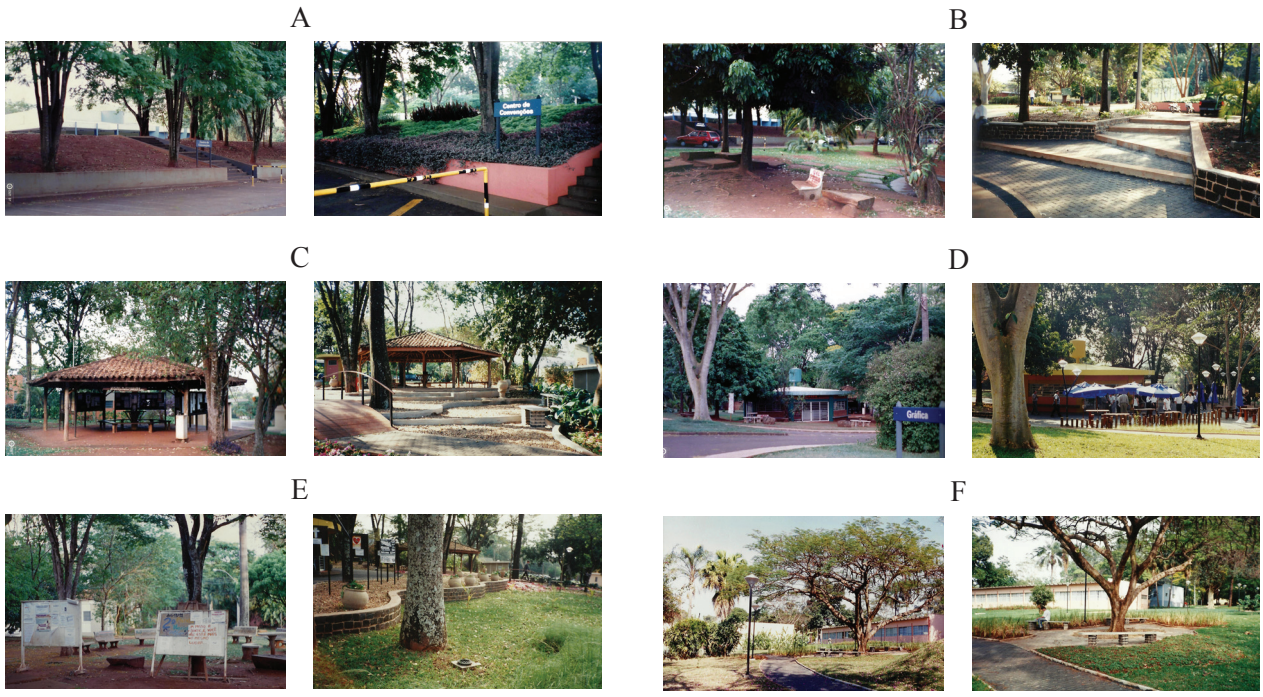

Figure 1. *Views before (left) and after (right) the implementation of a revitalization project in the square of the main canteen of UNESP/FCAV, Jaboticabal-SP.* ***A:*** *slope in the block of the convention center in front of the canteen.* ***B:*** *slope and retaining walls.* ***C:*** *kiosk.* ***D:*** *paved street removed and food court created at the side of the main path.* ***E:*** *removed panels and new panels.* ***F:*** *flamboyant path.*

The biggest changes occurred in the designed paths. One goes through the court, between the canteen and the existing kiosks, being known as “lateral way”. Where previously there was an interdicted street, it was built a “main path”, bigger (Figure 1D), to facilitate the traffic of pedestrians, particularly between the canteen and the four classroom buildings; presenting a tree form. In the beginning, it was designed a community center (Figure 2G), with space for shows and celebrations.

Figure 2. *Introduced elements in the revitalization of the square of the main canteen of UNESP/FCAV, Jaboticabal-SP.* ***A, B, C:*** *newspaper stand.* ***D, E:*** *bridge.* ***F:*** *food court.* ***G:*** *community center and fixtures.*

Another important change refers to the inclusion of a food square in front of the canteen (Figure 2F). Previously, people who frequented the place for a snack were restricted to a considerably smaller space.

A landfill at the side of the food square allowed the creation of a more appropriate area for the new panels that replaced the old ones (Figure 1E). Flowerbeds were created in several passages that intersect perpendicularly. An illumination project was designed.

The canteen square, so far unnamed, received the name of Roberto Burle Marx. With our own style, we introduced representations of his works, taking into account his concerns about the flora and fauna, seeking to represent nature in an organized manner and respecting the ecological needs of the vegetation.

There was concern in using plant species easy to maintain and, if possible, that offer food for birds and produce a lush landscape.

3. DETAILS OF THE PROJECT AND DEPLOYMENT

The project implementation was done in stages, according to the periods of rain and drought, which

correspond respectively to the months from October to March and from April to September in order to take better advantage of the time.

Tree pruning

During the second half of July 1997, five FCAV gardeners performed, in the canteen block, cleaning pruning and adequacy of trees, with guidance to maintain the natural shape of tree tops, using chainsaw, handsaw and a backhoe to reach the tops. This service was completed in two days.

Garden of Audiovisual Unit (UAD) building

This garden was deployed from 16 to 18 September 1998 (Figure 3A). The seedlings of medicinal plants [*Achillea millefolium* L. (yarrow), *Baccharis trimera* (Less.) DC. (gorse), *Plectranthus barbatus* Andrews (Indian coleus), *Cymbopogon citratus* (DC.) Stapf (lemon grass) and *Mentha spicata* L. (spearmint)] were obtained by vegetative propagation of matrices from the FCAV's vegetable garden and produced in a greenhouse in plastic tubes. Seedlings of *Acalypha chamaedrifolia* (Lam.) Müll. Arg. were bought.

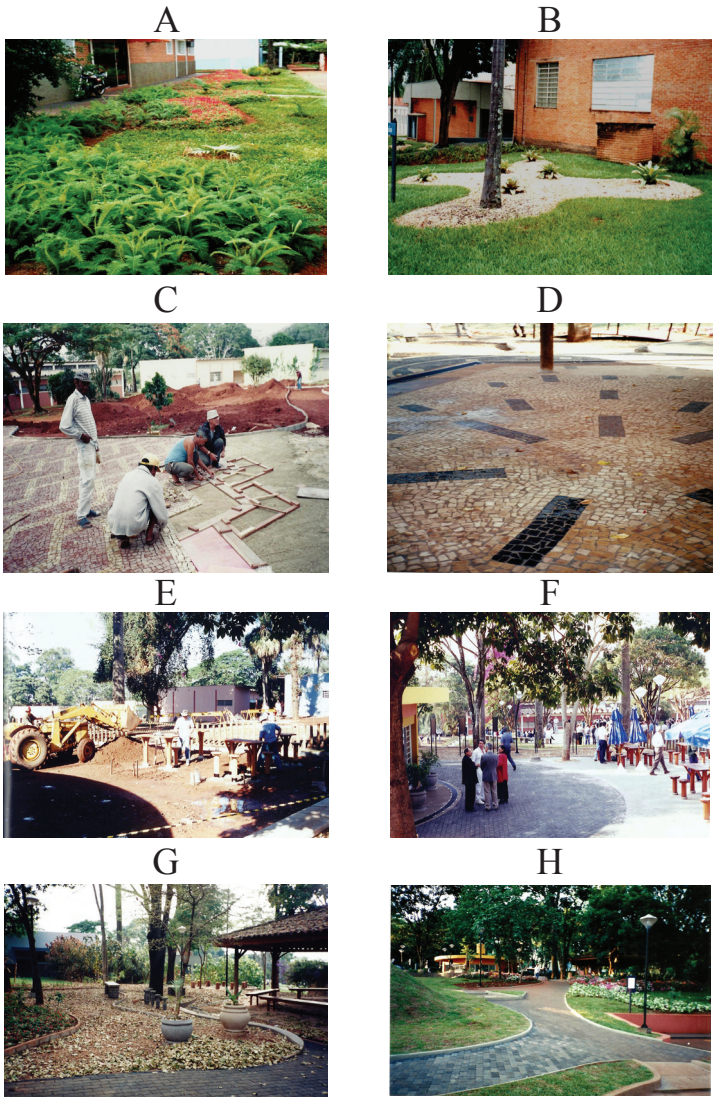

Figure 3. *Revitalization of the square of the main canteen of UNESP/FCAV, Jaboticabal-SP. Details: beds and floors.* ***A:*** *bed in the Audio Visual Unity garden.* ***B:*** *bed in the Microbiology Department garden.* ***C:*** *floor representing bark of buriti fruit.* ***D:*** *floor representing fireworks.* ***E:*** *shadow of the canteen building at the side of the food court.* ***F:*** *floor representing the shadow of the canteen building at the side of the food court.* ***G:*** *lateral path and mini-forest with vases, benches, banisters, tree stumps and dry leaves on the soil.* ***H:*** *paths with floor of blocks.*

The biggest problem in this stage was the infestation of the terrain by nut grass (*Cyperus rotundus* L.), which was removed with the aid of a mattock to avoid the use of herbicides.

Canteen's block next to the slope area located above the parking lot in front of the Convention Center (Figure 1A)

The soil tillage operations with rotary tiller and fertilization planting, formulated according to the soil analysis, were executed in September 1998. The production of seedlings (in the greenhouse, in trays with 50% of substrate Plantmax® and 50% of vermiculite) was made

from September to October, and the planting of seedlings, from October to December 1998. Seedlings of *Curculigo capitulata* (Lour.) Kuntze, *Tradescantia spathacea* Sw. and *Solanum violifolium* Schott ex Spreng. were planted with bare root; those of *Pilea microphylla* (L.) Liebm., *Areca triandra* Roxb. Buch. ex-Ham. and *Anthurium andraeanum* Linden ex André, with root ball.

Area around the Department of Microbiology (Figure 3B)

From October to December 1998, seedlings of *Chlorophytum comosum* (Thunb.) Jacques, *Russelia equisetiformis* Schltdl. & Cham., *Ophiopogon japonicus* (Thunb.) Ker Gawl., *Vriesea imperialis* Carrière, *Nephrolepis exaltata* (L.) Schott, *Pleomele reflexa* (Lam.) N.E.Br., *Agapanthus africanus* (L.) Hoffmanns. and *Cecropia hololeuca* Miq. (all with root ball); *Sansevieria trifasciata* Prain and *Sphagneticola trilobata* (L.) Pruski (with bare root) were planted.

Area closer to the canteen

Construction of channels – channels were built around the canteen and the kiosk for rainwater harvesting from roofs. In the canteen's case, the pavement of the food court has two soft slopes leading part of water to one channel and the other part to the channel built in the boundary between floor and gravel, where there were placed panels for poster.

Removal of asphalt and walkways - In January 1999, as there were no contrary opinions, the paved road that cut the canteen block (Figure 1D, left) was removed to provide more tranquility to pedestrians. They were also removed the concrete walkways around the canteen and toward the classrooms.

Cuts and fills – They were made from January to March 1999.

Retaining walls – The two retaining walls (Figure 1B) were built with mud brick and coated with existing cobblestones at the Campus. Each wall serves as a support for a big jardiniere, and among them there is a staircase access to the canteen. The design of this staircase came from adjustments of the existing steps in Abaeté Park, a project created by Rosa Grena Kliass and Luciano Fiaschi (GOLDEN, 1997). In part of one of the walls, they were seated four 1.20 m long concrete slabs and a topped with 4.5 m long slabs, giving rise to seats under the shade of a tree. The jardinieres and the staircases are shaped with angles similar to the design of the main path.

Trench and pit landfill – It was opened a trench with backhoe, for passage of the pipeline that goes from water outlet channel of the canteen to a culvert on the lawn. A box to catch rain water from the kiosk roof and the newsstand was made. When the trench was being opened, it was discovered a disabled pit, which previously received the canteen sewage; this pit was landfilled.

Construction of a newsstand (Figures 2A, 2B e 2C) – The construction is flagstone, has a glass door that opens into two slips and a window in each of the three walls of the back, positioned at the top of the wall to allow the exit of hot air. The walls were made of hollow brick, and the glasses are transparent, following the same pattern existing in the canteen. On the floor, a mosaic of peroba wooden blocks was made, following the shape of the newsstand, and the rest was filled with burnt cement. To set the sill, the mortar was mixed into the dye black Xadrez®.

Canteen reform (Figure 1D) – The exposed bricks from external walls of the canteen were already suffering deterioration; therefore, these walls were plastered. The three sliding doors and the common gate were also damaged. The rails of the sliding doors were made of iron and, as they had to be replaced, we opted for stainless steel, despite its higher cost, because it lasts longer. For painting, they used the same colors at the canteen and the newsstand: terracotta (external walls), dark ocher (external beams and pillars), light ocher (slabs, external walls of the canteen, and internal and external walls of the newsstand), and light blue (inner walls of the newsstand, internal walls and slabs of the canteen).

Main Path (Figure 1D, right) - This path, with an area of 585 m^2, followed the shape of a flourishing and growing tree, representing life. The width of the path varies between 1.80m and 2.40m, enough to allow comfortable passage for two people. After the staking, the ditches were open and the PVC pipe with 4" diameter was placed on, at a depth of 0.50m, for the passage of irrigation pipes. For passing the illumination tubing (polyethylene with 1 "diameter) PVC pipe with a diameter of 3" was placed at a depth of 0.30m. In both cases, 0.30m on each side of the passages were left off. The passages perpendicular to the largest slope of the terrain have their edges in levels, and the transverse passages to the largest slope of the terrain have the edges with a slight drop between them to facilitate the flow of water. The dimensions of the concrete guides used on the contours of paths, for a better finish, are 0.05m x 0.18m x 0.50m, and 0.05m x 0.18m x 0.25m. These tabs were used over the soil, so that in its inner face, after setting on the floor, there remained 6 cm to allow the flow of water. On the external surface, land was added and 6 cm were let free, where grass was planted. The floor, a mosaic made of Portuguese stones, forms a stylized drawing of the peel of the moriche palm's fruit (*Mauritia flexuosa* L. f.), with red and yellow colors (Figures 2G and 3C). To increase its durability, the Portuguese stones were laid over a layer of 5 to 6 cm of dry mixture of sand and cement at mark 1:7. The grout of the stones was made with dry mixture of these same materials in mark 1:3. At the end of the day, they were used manual sockets to compress and lay better the stones; after that, it was provided a copious watering. The next day, coarse sand was sprawled out on that floor, preventing it to get dirty with mud.

Side Way - It begins with a ramp behind the canteen, that turns easier its supply, and permits the passage of people in wheelchairs. Further, the side path merges with the canteen and newsstand's black floor, representing the shadow projection of the two buildings (Figures 3E and 3F). From there, there is a small expansion of the side path, just before the kiosk, inviting to walk through a small passage of sand and gravel in the woods and sit on one of the concrete benches located in this space (Figure 3G). There is also a small extension of the block floor between the floor of the upper side of the kiosk and a cobblestone

short wall, which works as a barrier against erosion. Just below the kiosk, it was expected to continue a side path; however, in this path, there is a big jequitiba-rosa tree. To protect its roots, it was decided to install a bridge of 5.0 m of length and the same width of the side path, 2.0 m, consisting of a cast iron frame with railway sleepers and courbaril wooden banister, varnished with the same product used in other woodworks (Figures 2D and 2E). A channel was built before the bridge to flow the water off. It was developed a range of boulders passing under the bridge and ending on the other side, between beds of *Impatiens walleriana* Hook. f. and *Calathea veitchiana* Veitch ex Hook. f., like a stream that ends among the vegetation. Crossing the bridge, the path continues and bifurcates into a bed of grass, giving way to the ladder of the community center or down to reach two ramps that give access to the street or the parking lot, whose nearest spot is reserved for handicapped persons (Figure 3H). There are lowered ramps for those people with special needs.

Kiosk (Figure 1C) - The existing kiosk was renovated. Contradicting the previous idea of using the existing floor as a counter flooring, it was decided to remove it, for two reasons: first, because it was necessary to give protection to the bases of the pillars, and second, because the roots of a tree were raising the existing floor. When the old pavement was removed, we cleaned and spent two coats of asphalt waterproofing solvent (Neutrol®) on the exposed bases of the pillars up to 6 cm above the floor height. After the Neutrol® dried up, sabots were made with mortar sand and cement (mark 1: 4). After the reformation, it is possible to observe the removal of existing panels at the kiosk, the lifting of the trees and the installation of new levels with cement benches. The pavement of Portuguese stones, seated at the kiosk in the same way mentioned in the main path, suffered a cut of 0.8m to allow the free development of the tree quoted previously. In all its surroundings, it was left some space filled with gravel until it reached the floor height. Two steps were made in one of the sides of the kiosk, in direction to the Department of Soils and Fertilizers. Someone who descends the stairs finds three gravel levels, and the middle one, the largest, has in its background a cement bench that measures 3.0m long. It is a lightly shaded and quiet place to rest. The same happens with the plateau more distant from the kiosk, which has a bench with 1.15m in length. These levels also serve as passage of pedestrians walking by the side path who do not want to cross the bridge. The mosaic floor of Portuguese stones followed the drawing of fireworks, being born of the East, as the sun, and celebrating good moments (Figure 3D). The shrapnel from fireworks are represented by black, and the rest by yellow. On the steps, continuity was given by the same drawing, reversing the colors. The roof was washed with water jets, maintaining part of the mud formed long ago, to stimulate awareness of old elements. Only the eaves, which were already damaged, were exchanged. All the woodwork has been sanded and varnished with marine matte varnish. The 0.30cm width seat that existed bypassing the central pillar of the kiosk was replaced by three other made of courbaril wood, with 3.50m long and 0.40m wide, positioned on three sides of the kiosk, offering better comfort and allowing to lie back on the banks. In this central pillar, there was a plywood table in poor conditions of conservation, used for phone support. It was replaced by another made of courbaril wood, with circular shape, 1.60m in diameter and 3.5m thick, with a triangle circumscribed. To highlight the drawings, walnut extract was applied on the triangle, darkening it; across the table it was applied marine matte varnish.

Food court (Figures 1D at right and 2F) - It is partially delineated by eucalyptus gateposts, with a diameter of 10 cm and spaced 13 cm apart, forming two fences in level and cut by undulations on the upper end, to give smoothness and lightness to the landscape. Between these fences is a free space of 2m wide, which is one of the accesses to the canteen. In this food court, on the part closer to the fence, there are seven tables with top in rectangular shape and cut corners to avoid accidents, and four stools for each table, two on each side. The tables measure 1.30 m x 0.6 m, with 3 cm thick, and each one consists of two surfaces spaced 1 cm; with 0.8 m height. Both legs of the tables and the stools are octagonal, and its diagonal measures 16 cm. The tops of the stools also have eight sides and measure 30 cm on the diagonal; its height is 0.5 m from the floor. The stools were seated so that the table top edge and the stool have a distance of 15 cm apart. The courbaril wood used was treated with two coats of Neutrol® on the first 40 cm from the bottom of the feet, which were settled with concrete, and the sabots were made just as in the kiosk pillars, to prevent premature rotting of wood; on the exposed portion it was applied marine varnish for protection. They were acquired 7 ombrelones for shading the tables. They measure 2.4m on the diagonal, are octagonal, made with Brazilian walnut frame and are armed on their respective brackets instead of being fitted into holes made in the floor. Thus, they can be moved; if there are strong winds, they are closed. Referring to the floor, we opted for flat blocks 7cm thick, manually seated on a layer of 3 to 5cm of common sand and rejointed with refined sand, allowing rain water infiltration. It was then pounded by machine. The model chosen has 16 faces, which facilitates the locking between the pieces. To represent the sun and shade, they were used black flat blocks on the area closest to the canteen and natural flat blocks (gray) on the remaining portion (Figure 3F). The floor of the staircase next to the canteen, as well as that close to the newsstand, also followed this drawing made by blocks. On floor edges, the workmanship was made with mortar mixed with black dye when the block was black and without dye when the block had the natural color. Around the trunk of the two trees that are in the food court, the blocks were cut with a machine; the finish was made with mortar, leaving a square space of 1.0 x 1.0m. On the tree site it was placed a layer of 4cm of sand and, over this, an 8cm layer of gravel, to reach the floor level; the sand function is to prevent the gravel from getting dirty. On gravel passages, as people go treading, the gravel dives in the sand; therefore, thicker layers were placed. As part of the food court, there is an adjacent space where the blocks were laid. The two spaces are connected by a channel that captures the water coming from the area where the tables are.

Panels for posters - The old panels were replaced by others specially designed. In this space, adjacent to the food court, are eight panels made from an iron frame with insert for a veneer 0.50m wide, 0.8m high and 12mm thick, at 1.15m height from the floor (Figure 1E right). These panels were designed for fixing posters on both sides. Cement pots and the cobblestone retaining wall value the site. To compose such an environment, a landfill was needed, and to support this landfill, a retaining wall of mud bricks covered with cobblestones found on campus was built. Sand and gravel were also used on the floor of the panels area, following the same pattern as mentioned.

Community Center - As the main path represents a tree, the community center (Figure 2G) starts from the base of this tree and is attached to it by a channel for water catchment. PVC pipelines 6" depart from both ends of the channel, skirting around the community center and meeting at its bottom, debouching the water into the asphalt gutter that goes from there to about 25 m into a culvert. Interconnected to these pipelines, seven boxes of 0.50m x 0.25m were built to help capturing the water from the community center. Over these boxes, guardrails were placed. A ladder was built on the slope of the community center to allow the transit of people between the area and the side way. It has six steps of 0.40m x 1.70m and 0.15m height (standard). To keep the ladder with few steps, two small levels were necessary, smoothing the slope of the bottom of the side path. The community center is the project site that suffered the largest landfill. To keep alive the two trees (*Sapindus saponaria* L.) located within it, 1.30 m square-shaped retaining walls were built around each one. These walls, which start from the tree lap, end fitting into a grid 6 cm above the blocks, preventing that the sweepers push the waste into these protective structures. Each grid is divided into two parts which, when assembled, form an open circle where the tree trunk stands. The grid function is to prevent accidents. The entire community center pavement used was natural colored blocks (gray). Two cement benches with 16.8m long each were made, in a symmetrical arrangement.

Flamboyant path (Figure 1F) – It was so named because of a beautiful flamboyant [*Delonix regia* (Bojer ex Hook.) Raf.] that is there. The floor is made of black flat blocks and starts from an extension of the side path, passing behind the community center. Next to the flamboyant, there is an access that allows users to take advantage of the environment under that tree canopy. The floor is made of gray flat blocks, and a free space left for the development of the tree was filled with sand and gravel until reaching the block level. Over the blocks, three cement benches were placed; their lengths are 3.0m, 2.3m and 2.8m. Surrounding this retreat, two flowerbeds were implanted, one with *Moraea bicolor* (Lindl.) Steud. and another with *Acalypha chamaedrifolia* (Lam.) Müll.Arg. From the highest part, one can see that the corner of the flamboyant and the community center pavements are of gray blocks and stay at different levels. The flamboyant path continues to follow the entire side of the CTA to meet the path that comes from the two school buildings.

Lighting - To rationalize the use of electricity, some luminaries (Figures 1D right, 2G and 3H) were connected by photocells, while others have their own contactors, which allow lighting these fixtures during evening events. The only part of the vegetation illuminated was the set of four royal palms. To highlight it, vapor lamp mercury 250W suitable for gardens (GARCIA JUNIOR, 1996) was used A built-in reflector was installed 1.0m away from each of the four palms, illuminating them from below upward. As the community center and the food court next to the canteen needed better lighting on their paths, eight luminaries, two by post, were installed at each site. The double lamppost design was developed with the proposal to follow the lines of the luminaire and compose with the other elements design. For rationalization of energy, some fixtures are connected by contactors driven by photocell, while others, like the four reflectors of palm trees, present themselves contactors triggered manually. There are two circuits in all the fixtures, allowing it to be turned on automatically or manually. The other control and protection frame, located near the community center, has two circuits. The first is triggered by photocell and serves six fixtures. The second is manually operated and serves 19 fixtures. The control and protection frames, as well as the measurement frames that serves the canteen and newsstand, were seated on a small 1 1/2 common bricks wall, with 1.30m wide and 1.10m height. The face of the wall opposite to the frames is facing a direction of great visibility, and its surface was used to create artistic panels.

Artistic Panels - The first panel on the short wall that supports the measurement framework for the newsstand and the canteen was prepared by children from three to six years old that use the day care of the campus. Sticks were used to draw on the fresh cement (grout of the short wall). The second panel, next to the community center, was developed by some of the professionals who carried out the project, among them bricklayers, servants, electricians, carpenters, locksmiths, gardeners, tractor drivers and painters. The third panel, next to the canteen stairs, was drafted by the CTA students. They were all dated and, after drying the grout, coated with cement slurry, water and Bianco® glue.

4. EVALUATION OF RESULTS

Regarding the wooden bridge, its slope is steep. In order to prevent users from slipping, non-slip strips were placed on the dormants.

Concerning the lighting, as rectilinear paths are relatively short, the permanence of lit luminaries only in the curves is sufficient. In addition, when activating the lighting of the four palm trees, a penumbra in its surroundings would produce better effect, being advisable to reduce the number of luminaries with photocells.

Regarding the development of plant species, initially, there was a loss of up to 5% of seedlings used, which is a great result. All species, except *Nephrolepis exaltata* (L.) Schott, presented good adaptation to the local where they were planted.

By November 1999, only three species showed phytosanitary disorders. In older leaves of *Achillea*

millefolium L., they were noted symptoms of powdery mildew (caused by the fungus *Erysiphe cichoracearum*) in 45% of the plants. Rounded yellow spots, variable in size, were found in *Solanum violifolium* Schott ex Spreng, about 1.0 cm in diameter, caused by the fungus *Cercospora*; then these spots dried and stood out of the leaves. In *Acalypha chamaedrifolia* (Lam.) Müll. Arg., flies were observed in located points, identified as *Bemisia tabaci* (whitefly). The use of pesticides in gardens is not recommended, and so when one species shows to be very susceptible to a pest or disease, its planting in the place should be avoided.

The presence of foot-washing ants and termites was noted. There was also nutsedge invasion in many places.

One of the seedlings of *Vriesea imperialis* Carrière was planted under the palm *Syagrus romanzoffiana* (Cham.) Glassman. The fruits of the palm tree fell on this seedling, fermented in the water accumulated in the center of the plant and caused its death.

Seedlings of *Nephrolepis exaltata* (L.) Schott, *Anthurium andraeanum* Linden ex André, *Echeveria elegans* Rose and *Impatiens walleriana* Hook. f. were stolen, which indicates the need of awareness campaigns.

Years after the implementation of this project, there is the need to reactivate the necessary maintenance care: cleaning, clearing of channels, permanence of a gardener on the site, seedling production to replenish shortages. The flowerbeds, such as *Impatiens walleriana* Hook f., so appreciated, no longer exist.

However, the transformation of these spaces was and is continues to be enjoyed by the users.

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