B158

THE
HEALTHCARE HUB

contry: **BRAZIL**

City: **SÃO PAULO**

Neighborhood: **NOVA ESPERANÇA VILLAGE**

Targeted time: **2020**

Tipe of healthcare service: **PUBLIC HEALTHCARE CLINIC + PUBLIC COEXISTENCE AREA**

How would be the health units of the future?

Thinking about the paths taken by today's public and private health institutions in Brazil – isolated from the urban context and less and less worried about improving social interaction –, the answer to the question above should suggest a quick paradigm shift. Therefore, this project aims to widen the horizons of São Paulo's basic health units, intending to create a social facility that offers the community areas of interaction, leisure, and sports, as well as taking care of the local people's health in a preventive and humanized way.

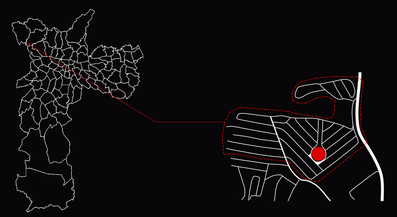
Thus, the Healthcare Hub comes up, a public health clinic that not only practices preventive medicine but also offers basic examination and simple outpatient treatment and is open to the community. Along with the mixed activities program, mixing community center and health care, this urban facility would be managed through a computerized digital system with access to the internet that would organize the medical care and the examination, as well as generating epidemiologic data in real time in order to feed the public managing strategies.

The location

The location that was chosen to the implementation of this social facility is a peripheral neighborhood in São Paulo called Vila Nova Esperança, which is located on the city's northwestern region, a relatively new neighborhood that has no public health facility. Its residents need to cover long distances in order to get medical care, examination, and treatment.

Right in the middle of this neighborhood there is an unoccupied round area that was probably designed to be a public square with interaction areas. A multi-sport court, a small playground, and an outdoors gym were built in it, but they were all deteriorated by time, which shows the failure of the area's occupation due to a lack of adequate urban design.

This location was chosen with the intention to achieve two objectives at once: to offer health care to the neighborhood and to occupy the area in a more effective way, providing the civic character that was initially intended.



The type of health care unit

The idea is to create an urban condenser where health care is the primary activity: the motivation to occupy the area. Thus, the Healthcare Hub will offer a public basic health clinic and social interaction areas.

The clinic will have:

- a general practitioner (adult and geriatric care), gynecologist, pediatrician, and dental care;
- a unit for imaging examination (with x-ray, computerized tomography, densitometry, endoscopy, ultrasonography, mammography, echocardiogram, electrocardiogram, holter, and ergometry);
- a lab for clinic analysis capable of analyzing blood, urine and stool samples;
- a pharmacy for medicine distribution;
- a physical therapy unit;
- an occupational therapy unit.

The service is local, preventive, and it treats for motor and psychological recovery. This unit would not perform emergency care, invasive interventions, complex procedures, surgeries and hospitalizations. It would be the first stage of the public service, monitoring the health of the population, distributing the patients to other institutions in advance, and treating simple cases of motor and psychological recovery. Along with the health care and treatment program, the Healthcare Hub would offer a civic space, which currently does not exist in the neighborhood.

On the floors that relate directly to the city (ground floor with two different levels), there would be an auditorium (to establish a dialogue with the community and for plays and shows), an outdoor gym, a playground, and an area for skateboarding. All these areas could be used 24/7. On the rooftop, which can be accessed directly from the main entrance through the stairs and elevators, without going through any clinical unit, there would be a sports court that could be open for 15 hours a day, seven days a week. All these spaces would be constructed to have an intense relationship with the city, in order to improve the local urban interaction.



The technology

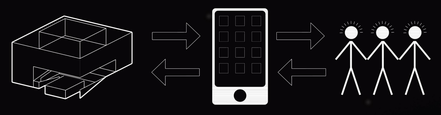
Because it is a social facility with a public management, we decided not to endow the building with technologies that would take too long to be affordable for the state. We chose technologies that are under development or already available. This social facility would be managed through an electronic system with an online interface that would perform two tasks: managing the relationship between the institution and the local residents through a smartphone app, and generating epidemiological data for a health care Big Data, providing strategic information for public management.



The app

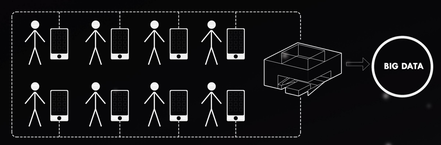
The Healthcare Hub would have an Information Technology team that would manage the electronic system, the community relationship app, and the entire database generated. Each local resident would install the app on their smartphone, register, and create a profile that would be linked to the members of their family who live in the same residence. This app would let their family members know about the dates of the consultations, exams, and other visits. This would be organized by the institution's electronic management system.

The real-time system-application interface could optimize processes, cancel appointments more quickly (through confirmation from residents and doctors), reschedule, and monitor people's attendance with their health commitments. Thus, it would be possible to know when someone has left the treatment or did not show up.



Big Data

With the app interface, this system would generate concrete data from the epidemiological profile of the region, offering valuable information and statistics for public authorities to better plan their investments. The institution's IT team would be responsible for the data security, preventing the residents' clinical history from becoming public. They would encode and compile the data according to the requests of the public health office.



The technology

The building would be made with prefabricated systems with mostly metallic components. The entire project respects a 1.25 m x 1.25 m modulation, which results in great flexibility for the production of components, the installation, and future amendments and replacements. The building was conceived in accordance with the health care buildings' constant need for updates in order to be flexible, which allows easier future works and changes in the facilities.

One of the elements that result in this flexibility is the technical room, dedicated to the most robust machines and located above the unit of imaging examinations and below the sports court. This space would be used for the installation of air-conditioning machines, rainwater tanks, water treatment equipment, meters, transformers, pumps, etc. Its size allows the technology development, as well as easy maintenance of the equipment.

Sustainable systems

Some suggestions have been made in order to reduce the consumption of natural resources:

The electric energy would be generated by a system made with photovoltaic plates without storage by batteries.

The water consumption would count on a filtration system and reuse of rainwater and water from the local stream for toilet flushes, dump vats, irrigation of gardens, and washing of the external areas.

The sewage would be totally treated on site by a compact station formed by anaerobic and aerobic filters, pouring the clean water into the local stream.

Power generation

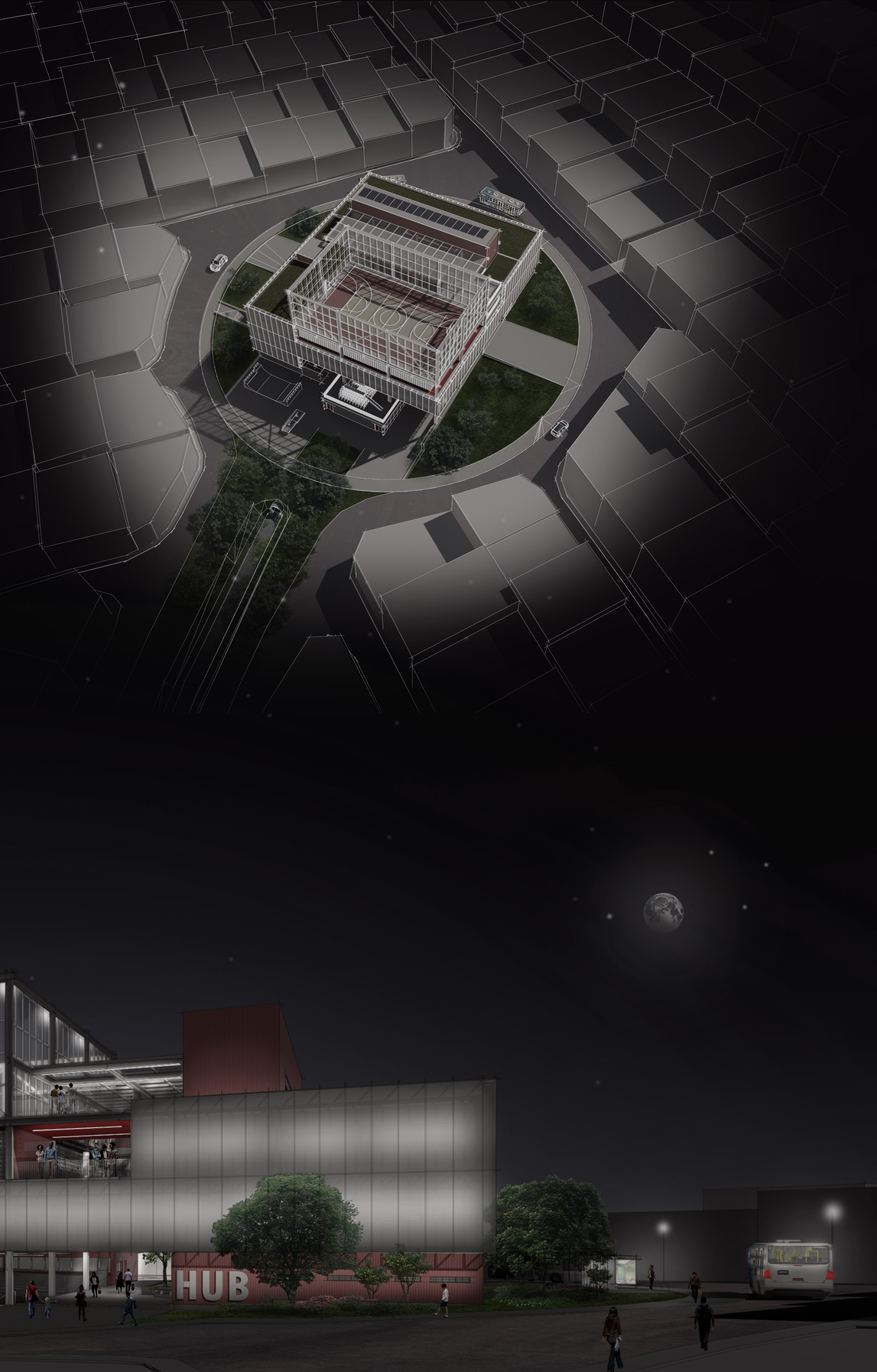
The power generation system would be a small solar plant, made of photovoltaic panels, generating energy in real time during the day and sending the extra energy to the local power grid. The system's generation capacity is twice the institution's daytime consumption, with the surplus of about 50% of the production being "lent" to the public provider. At night, when the energy consumption is lower (because the imaging unit and the laboratory would not be operating), a power supply exchange would take place and the institution would be powered by the energy provider, with the "return" of part of the borrowed energy. Therefore, there would be no cost other than the system's installation and maintenance and the investment would be returned in less than three years.

Water treatment and reuse

Rainwater would be collected and stored in tanks located on the second floor technical room, as well as treated by anaerobic filters, chlorinated (to be distinguished from drinking water), and pumped to specific tanks in the engine room on the roof. This water would feed the auxiliary system used in the toilets, the irrigation system, and the washing of the external areas. During dry seasons, this system would be fed with the local stream water, which would be collected in the underground technical area, pumped to the reuse tanks, treated, and distributed in the auxiliary system.

Sewage treatment

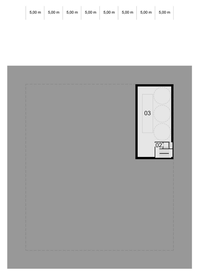
Sewage would not be dumped into the public system. It would be stored, treated, and dumped in the local stream when presenting adequate conditions for the environment. The treatment would be made by a compact, industrialized system, composed of anaerobic and aerobic biological filters that would be buried and accessible by the underground technical area.



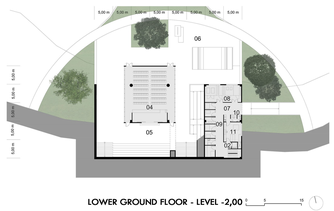








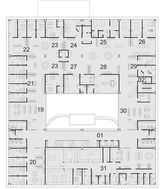
SUBSOIL - LEVEL -5,00



LOWER GROUND FLOOR - LEVEL -2,00



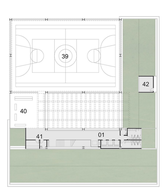
GROUND FLOOR - LEVEL 0,00



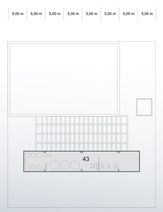
FIRST FLOOR - LEVEL 3,80



SECOND FLOOR - LEVEL 7,60



ROOF - LEVEL 11,40

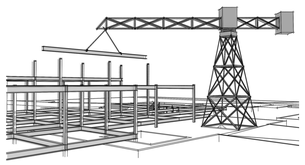


MACHINE ROOM - LEVEL 14,65

01- public vertical circulation
02- staff vertical circulation
03- lower machine room
04- auditorium
05- public space
06- skate area
07- supply access
08- power cabin
09- technical areas
10- security
11- warehouse
12- playground
13- staff confort area
14- pharmacy
15- locker rooms
16- information
17- social assistance
18- open air gym
19- waiting room
20- children's ambulatory
21- general ambulatory
22- dental outpatient
23- gynecological outpatient
24- RX
25- endoscopy
26- cardiology exams
27- densitometry
28- computed tomography
29- ultrasound and mammography
30- exam delivery
31- interstitial space
32- covered square
33- occupational therapy
34- physiotherapy
35- secretary
36- physical files
37- server
38- management
39- sports court
40- open air square
41- support
42- machine room
43- machine room and water tanks

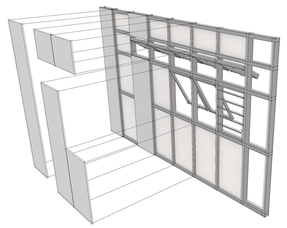
STRUCTURE

Prefabricated metallic structure with 10 meters of distance between pillars. This solution brings flexibility and speed to the construction and allows the reuse of the material in the future.



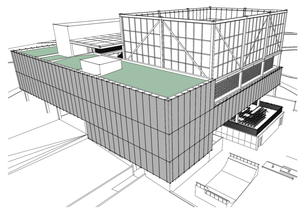
FACADE CLOSINGS

Executed in metal frames and dry walls, similar to the "stell frame system". Each module is 1.25 meters wide, and can receive windows or various plates. This solution brings flexibility for future space changes.

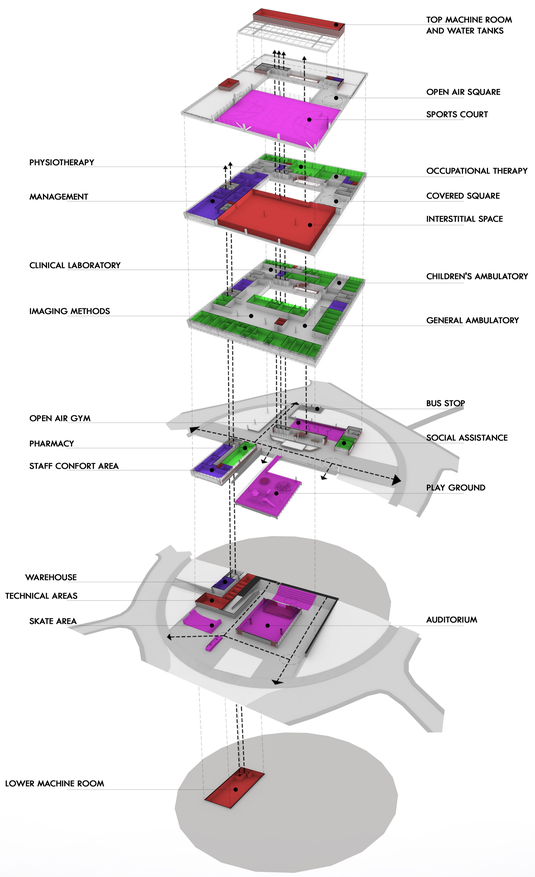


THERMAL CONFORT

Two solutions were used to reduce the heat gain of the building: microclimatic facade and green roofs. The microclimatic facades cover all the faces that have windows to the outside. The roofs would be executed in thermal tiles and would receive modules of grass.

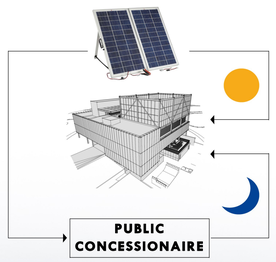


PROGRAM NEEDS DISTRIBUTION



POWER GENERATION

Photovoltaic power generation system, linked to the public network. During the day the solar system would generate energy to feed the building and would inject the surplus in the public network. During the night the system would reverse, and the building would be fed by the public network. This solution avoids the storage of energy in conventional batteries.



REUSE OF RAINWATER

Modular system for storing, filtering and reusing rainwater. The water would be collected on the roof and stored in special cisterns located in the interstitial space, where they would be filtered and treated. Later they would be pumped to elevated reservoirs, chlorinated and distributed to the sanitary vessels and washing of external areas.



SEWAGE TRETMENT

Sewage treatment would be done through an anaerobic and aerobic system by a "compact effluent treatment station", located in the lower machine room. All sewage would be treated before being discharged into the public sewer system.



