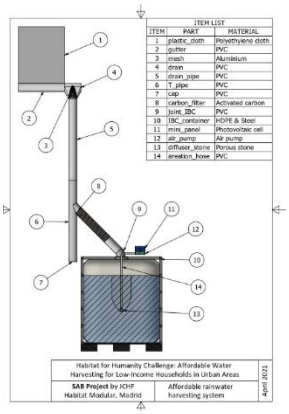
Activity Report "Installation of SABUC Prototype"

October 2023

The installation process of the SABUC system in alliance with the Metropolitan Autonomous University (UAM) has advanced during the months of May to October 2023, different challenges have been faced to develop the system prototype. This is because the plans and instructions from the developer (Jesús Chico Fernández) were not completely complete or omitted steps in the installation or adaptation of other technologies to the SABUC system. This implied that UAM engineers reviewed, adapted, or replaced certain elements of the original design in order to guarantee the installation of the system and its correct operation when capturing and filtering water. Laboratory tests were carried out to calibrate the operation of the system as a whole and install the system in the home. Below, we mention some of the challenges and how they have been resolved.



A pilot family was selected: To facilitate the installation of the first SABUC system, the UAM chose to select 1 family that would allow us to carry out measurements and previous visits to guarantee the installation; In turn, Habitat carried out a structural evaluation of the home to ensure that it was not structurally damaged, or its safety was compromised. The family is from a peri-urban area of Mexico City and does not have access to water; their neighbors give them access through improvised hoses and water arrives every third day.

With the selection of the family and previous analysis, several adjustments were made to the system that do not compromise the original design, but do improve the quality of the materials originally proposed, these are:

The canvas was changed to waterproofing, this is because the roofs of the homes have exposed steel or the canvas can break easily; Waterproofing is chosen because the cost is similar and the benefit for the family is greater, since the collection space is covered and guarantees that humidity does not concentrate on the ceiling.

Hydraulic calculations were developed, with the measurements made in the home, a flexible first rain separation system was developed, this with the purpose of making the maintenance of the system easier for families. The calculations allowed us to see that the proposed surfaces (30m2) can capture enough water to guarantee the filling of a larger storage system.

The electrical systems were modified: The original SABUC design considered a solar panel, however its characteristics were insufficient for the voltage required to power the aeration pump and the UV filter, so the UAM engineers opted to double the power and place a second panel that could guarantee the operation of both devices without compromising the resistance of a single solar panel. Likewise, the electrical installation was changed to only have a single connection with the panel.

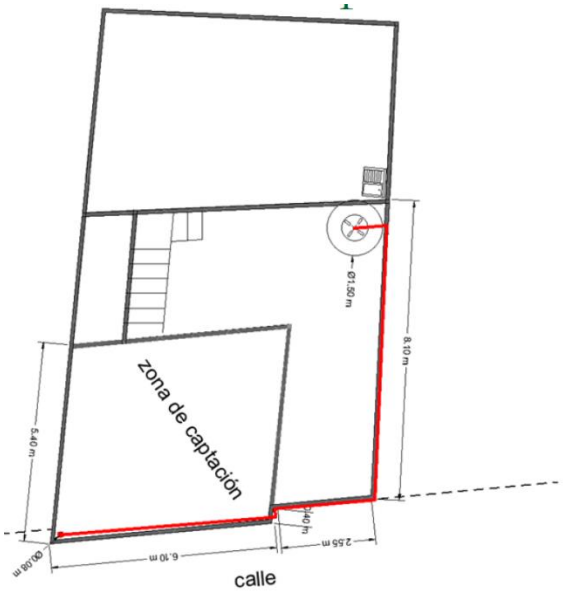
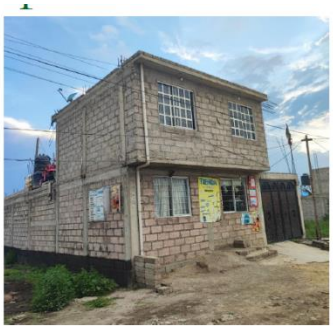


Figura 2: primer piso de casa 1 (piloto)



Fotografía 1 de la Zona de captación:

The water filters were replaced with better quality ones. With the above, higher quality filters were chosen, both the aeration pump, UV ray filters and the activated carbon filter were connected to guarantee the process.

A water quality monitoring measurement system was added, this device is property of the UAM and was not part of the original design, this device allows the measurement and storage of data, since it connects via Bluetooth to

a mobile device and charges the information to a database, with this we will review in "almost real" time the quality of rain that is captured.

The water storage system was changed, a 2,500-liter system was chosen since families with at least 4 members were considered, so a larger system was required, an additional reason was that the IBC system was of lower quality and could encourage the development of algae inside

With all the changes, the system was installed in the "pilot home", the system has been installed in a period of 2 days, this is because challenges were faced in the installation that do not necessarily represent a risk in the future, the idea is that it can be installed in a single day. With the family, a monitoring scheme was defined to validate if the product increases access to available water, this will allow us to identify how viable the product is. We await the first results with the pending October rains.

In addition to this, the remaining 9 families have been selected, all estimates and calculations will be made during the month of October to be able to install in the month of November. In these other homes, families with tin roofs are considered.