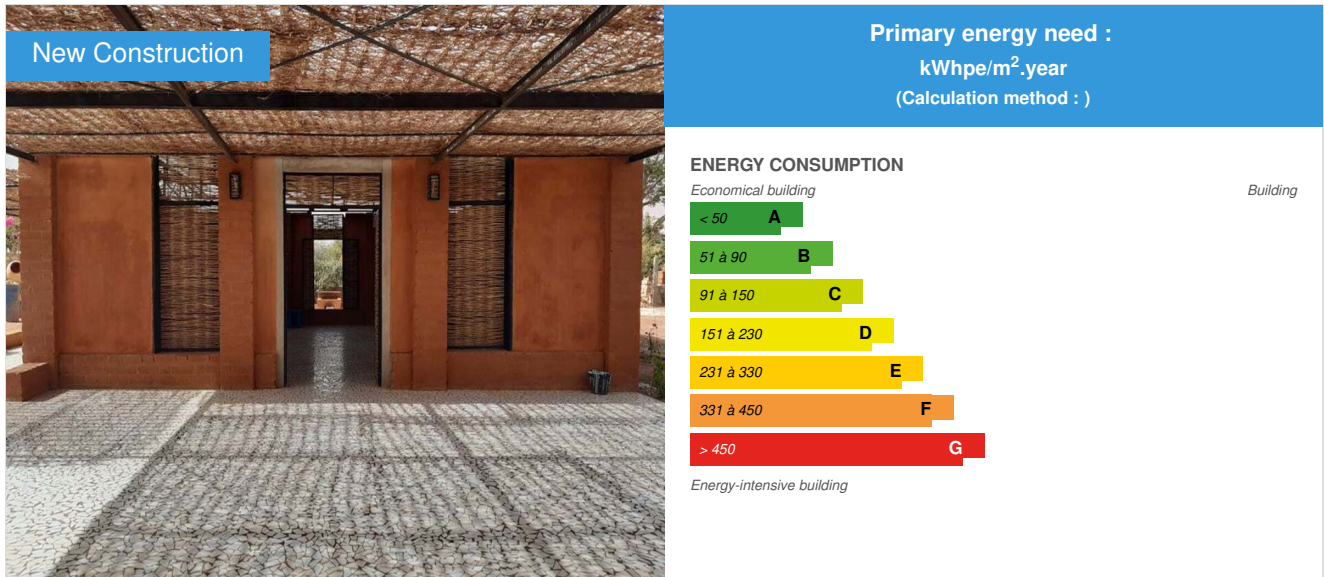


Louly's Canteen

by Association KHADJIR / 2023-02-27 18:24:21 / International / 50 / EN



Building Type : Other building
Construction Year : 2019
Delivery year : 2020
Address 1 - street : Route de Fatick C4PM+G8 LOULY BENTEGNE, Other countries
Climate zone : [As] Tropical dry

Net Floor Area : 165 m² SHON (fr)
Construction/refurbishment cost : 23 000 €
Cost/m2 : 139.39 €/m²

General information

En français

The Louly canteen, a "work-school"

La Cantine de Louly is a project that was set up in parallel with our architecture studies (between the third and fourth year, during our gap year) in association with the Dakar-based architecture firm Ga2D.

After a few trips to Senegal, and more particularly to the village of Louly, a bush village located about 80 km south of Dakar, the capital, a project emerged.

The Sainte-Emilie de Villeneuve school, run by the Sisters of the Immaculate Conception and managed and financed by the Louly association, has more than 500 pupils from nursery school to 3rd grade. Thanks to the association, the school has been made accessible to pupils from neighbouring villages and a canteen, run by some volunteer mothers from the village, has been set up. Sitting in the shade of a baobab tree and bringing back from the village the pots and dishes used to prepare their delicious thiéboudiènes, the mothers prepare 130 meals 3 days a week. The project of a place to facilitate their work, a space for them and for the children, in the shade and protected from dust, then takes root.

For a year, we prepared the project. We created an association, "Khadjir", which means "sharing" in Serer, the village language. We communicated to collect donations for its construction and we met, thanks to an internship in the company Elementerre, actors of the earth sector in Senegal.

Then, it was in Louly that the rest of the adventure took place. Louly is a village located on the main road to Fatick, in the Serer country. It was in the village school that a real "school site" was held, the site of a canteen that was built under our hands, students, under the hands of local craftsmen and villagers, together.

Architectural strategy

The programme of the canteen is simple: a refectory, covered but not closed to the air, a shaded outdoor kitchen, a pantry and storage space and a large terrace, as an extension of the refectory.

Like its programme, the volume is simple. It is built on the basis of the dimensions of a brick. A grid of posts supporting the roof gives rhythm to the building. A base in BTCs (compressed and stabilised earth bricks) ensures the continuity of all the spaces and becomes at times a spandrel, at times a bench, at times a passage. The infill walls vary: they are made of plastered adobes, and are fitted with kinkeliba woodwork woven by a village elder and his apprentice, or with a moucharabieh, to provide fresh air and views of the outside.

At the back, a small volume stands out and houses the most sensitive spaces such as the pantry.

Adapting to local materials and construction methods

In a country where cement has become king, the first objective was to revalue local resources and those of the village. The canteen is therefore covered with ochre, bricks, adobe and fibres. It adapts to the know-how and innovates, reinvents traditional techniques and forgotten materials and assumes its contemporaneity.

Although the use of earth was difficult to get accepted, the inhabitants were willing to play along. In order to adapt to the new know-how inherited from the domination of cement, the choice of material that seemed most obvious to us was brick, whose implementation is close to that of breeze blocks. Thus, the unplastered and exposed bases and posts are made of stabilised BTC manufactured 30km from the village and the infill walls are made of adobe. After a few days of training, the inhabitants were given responsibility for their construction.

The roof structure is made of long metal lattice girders. This technique allows for a wide span and frees up the central space which becomes capable of various uses. Although steel is an imported and expensive material, its use is widely developed in the country. Wood was not chosen here because the village of Louly is located in a desert area where trees are rare. Wood, although a natural material, is itself imported into the village. In addition, Senegal, like many other countries, is plagued by termites. Wooden structures are generally infested with termites and their durability is reduced. This is also why the choice was made to use a sheet metal roof (rather than a straw roof which has to be replaced frequently). Added to the cement, the sheet metal perfects the image of modernity to which Senegalese everyday constructions tend. It is everywhere. Although it is highly conductive, causing significant overheating, its durability and simplicity of installation tipped the balance. The roof of the canteen is therefore made of sheet metal, like the rest of the school buildings, but here, large overhangs and the elevation of its structure in relation to the walls make it possible to limit the discomfort for which it is criticised.

For the pantry space, the material used was important to maintain a cool temperature and humidity. With adobe masonry, terracotta panels providing additional insulation and a terracotta slab floor, the pantry ensures the freshness of the food stored there. As our site meetings and lunch breaks show, this is the most comfortable room!

Photo credit

Association Khadjir

Stakeholders

Contractor

Name : Immaculée Conception de Mbour

Construction Manager

Name : Ga2D

Stakeholders

Function : Designer

Association Khadjir

<https://www.instagram.com/association.khadjir/>



Assistance to project management, design, craftsmen

Function : Company

Yadenne Construction

Function : Others

Elementerre

Earth specialist - training support for the manufacture of adobes and earth plasters, design, craftsmen

Function : Construction company

Residents of the village of Louly

Function : Construction company

Local craftsmen

Carpentry, masonry, tiling

Contracting method

Other methods

If you had to do it again?

If we were to do it again, we would not hesitate, both for the constructive and professional experience and for the human experience that this project has given us all.

The Louly canteen was inaugurated three years ago and, after other trips there for some, it is possible to take a step back.

In a very concrete way, the canteen, still today, illustrates the good and less good conceptions that we imagined, in particular those related to the use and the habits of the inhabitants who appropriate it and who modify some of the elements, which we will then be able to consider in the future as of the design or the building site (mosquito nets, shades, furniture, etc.)

On the other hand, the canteen, only three years later, continues to be a real "training site". At the time of the project, we were students, and it was our first concrete project. Some of the details, especially some concerning the protection of the earth masonry and the importance of giving it "good boots and a good hat" (important base and roof overhangs), give us the possibility to step back and imagine improvements in implementation. Furthermore, it illustrates the need to use good quality materials, especially when it comes to earth. Indeed, the BTC are made with laterite soil, which does not have a sufficient proportion of agility to ensure the good cohesion of the bricks. Thus, although protected, the bricks tend to disintegrate and crumble.

With more time, a construction site like this can allow for ownership and some improvement of the construction. Training or awareness-raising workshops should be developed more extensively, not only for the inhabitants but also for women and children, especially in villages where construction with earth or fibre is becoming increasingly rare. The Louly canteen has been the basis for real participation and integration of users in the project. Presentations before and during the construction site made it possible to make the project known and to integrate the local populations. A model and sketches were used as a presentation medium and the inhabitants who worked with us became in turn mediators of the project. But it is obviously always possible to do "better" by involving them over time and in all phases of the project, from the analysis of the local architecture, to certain architectural choices, to the appropriation phases, well after the building site.

One of our "regrets" (if you can call it that) has been that women are not sufficiently involved in construction. Their role in village communities is crucial, but they are generally absent from the construction world. Nevertheless, this would have allowed us to integrate them in certain choices and to offer them the opportunity to participate in the construction in the same way as we did (we were three students on the site).

Finally, and still with the aim of reducing the carbon impact of the construction world, which is very, and even too, energy-intensive, the use of cement could be further reduced! This reflection obviously goes hand in hand with the notion of raising awareness, because building with earth today in Senegal, at least in this part of the country, is not always easy. It is necessary to convince the authorities, the elected representatives and the inhabitants that earth or fibres are not only materials of the past and that they have real impacts on comfort, the economy, local development, emancipation, etc.

Building users opinion

The Canteen was born from observation and immersion with the mothers, under the baobab.

Today, they are proud to have their own space and happy to be able to prepare the children's meals there.

But the canteen is not just a canteen. It is a place of celebration, its terrace is now a football pitch for the children at break time, a classroom from time to time... A real place for gathering and sharing.

Renewables & systems

Systems

Heating system :

- No heating system

Hot water system :

- No domestic hot water system

Cooling system :

- No cooling system

Ventilation system :

- Natural ventilation

Renewable systems :

- No renewable energy systems

Environment

Urban environment

The Louly canteen project is integrated into the Louly school.

In its proportions, the canteen fits into the width of the existing buildings and its exterior terrace allows for continuity with the nursery school building.

Resilience

Senegal has a tropical climate with a dry season from October to June and a rainy season from June to October.

The high temperatures are often unbearable, especially when the almost systematic metal roofs cause considerable overheating. Here, although the roof is made of sheet metal, its elevation allows a large natural ventilation and allows the hot air, which enters the building through the moucharabiehs and the windows, to leave the building through the large openings allowed by this elevation.

During the wet season, the rain can be very heavy and falls almost horizontally. The large roof overhangs therefore protect the earthen walls and the cement stabilisation of the earthen bases protects the feet of the walls from the splashing of rainwater.

Products

Product

Raw earth bricks

Elementerre Company - Residents of the village of Louly

Product category : Structural work / Structure - Masonry - Facade

In the Senegalese collective imagination, cement is seen as the material of solidity and robustness, as the material that does not need to be coated or protected.

Unlike concrete, earth is the material of the past, of the ancestors, of nostalgia. It is denigrated, almost systematically associated with poverty. However, in many places, the advantages of its use are known and understood, but its bad image persists.

It is in this context that the canteen, through the use of this material, attempts to give a new, contemporary image to the earth.

In order to facilitate the replicability and appropriation of earth by local inhabitants and craftsmen, it seems likely that the raw earth brick is the most plausible alternative to cement blocks. Assembling, manufacturing, price, it has advantages and could well compete with it, after acceptance and awareness raising.

The canteen develops three uses for raw earth bricks.



The abodes

Residents of the village of Louly

Product category : Structural work / Structure - Masonry - Facade

Adobes are technically very accessible. They are easy to make and the tools needed are simple.

Like cement blocks, they are the symbol of democratic materials that anyone can make, provided that the correct proportions and drying times are observed.

Adobes are also very economical. All the resources needed to make them are local and generally available on site. They are therefore very advantageous financially, compared to breeze blocks, whose cement is expensive, too expensive in many cases.

Unstabilised and made only with bio and geo-sourced materials (site soil, termite mound soil, laterite, sand, plant fibres or other), adobes are recyclable for life.

Finally, adobes have many advantages in terms of comfort: they have an interesting inertia to protect against harsh climates, they allow the regulation of hygrometry and they favour insulation and acoustic quality, among others.

However, as an old and traditional technique, it is nowadays more difficult to accept socially in construction.



Lightweight earth bricks

Product category : Structural work / Structure - Masonry - Facade

Lightweight earth bricks, a mixture of clay and water with vegetable fibres, also offer a new alternative to cement bricks.

In Senegal, the company Elementerre has made typha its hobbyhorse. Typha, a reed from northern Senegal, is renowned for its thermal qualities. It is ground into small fibres and mixed. The bricks are then moulded in moulds of varying sizes.

The insulating panels (30x60x6cm) can be installed on any type of support and provide thermal correction and additional insulation.

Lightweight earth bricks of the size of adobes (15x30x10) can be used as a filling wall, making the whole wall more efficient in terms of thermal or acoustic performance.

Finally, the earth-typha slabs. Thanks to a mould with the right shape and size, the bricks resemble commercial cement slabs and provide a real alternative to the widely used roofs made of beams and slabs, which are not very comfortable for their inhabitants.

These bricks, which are not yet widely developed, represent a real advance in terms of construction, both in terms of the thermal contribution they provide and their constructive similarity to cement slabs. It is thus possible to create intermediate earth floors and even flat roofs.



The BTC

Product category : Structural work / Structure - Masonry - Facade

CLT are mud bricks, shaped with a press. In many cases, CTBs are stabilised by adding cement to the mixture. During the drying process, which takes place in the sun, the cement sets and makes the bricks much more resistant to rainwater. This resistance allows them to be left uncoated without affecting their durability over time.

This durability gives them a real aesthetic advantage. Compressed and stabilised, the bricks are regular, perfect (or almost) and all similar. Visible on the façade, they give a new character to buildings, making them brighter and more colourful from the outside. They can also be used for cladding and for creating rhythmic, different and interesting facades.



BTC is the material that combines modernity and tradition, cement and earth. Progressive and innovative, BTC allows the introduction of earth into everyday construction, both in rural areas and in urban centres.

Costs

Construction and exploitation costs

Total cost of the building : 23 000 €

Subsidies : 23 000 €

Additional information on costs :

The project management (Khadjir Association and Ga2D architectural agency) was carried out on a voluntary basis.

The donations collected before the construction allowed to favour the use of local resources (which have the advantage, in many cases, of being available in the village, at a lower cost, or even free of charge), to offer employment to the inhabitants, to value the work of local craftsmen, to train and raise awareness of raw earth construction...

Circular Economy

Communication

Communication on the process : Yes

If so, please specify :

Communication was one of the keys to getting the project off the ground.

The entire project was funded by individual donations. When the association was created, a major communication campaign was needed to convince potential donors. Social networks, emails, explanatory and descriptive leaflets were sent out to prove our motivation and competence to carry out this project. Communication is a key to convince and it allowed us, before the beginning of the construction site, to collect the sum necessary for the construction or material donations (construction site stuff, sponsors, etc.)

Once on site, communication was also important, almost daily on social networks and weekly by email, to inform the donors who made the construction possible of the good progress of the construction site. In addition, videos were made throughout the construction site to explain this human and constructive adventure, following the construction steps step by step.

Social economy

Social economy and professional integration :

The Louly canteen project proposes to promote local development.

The bio and geo-sourced materials, available nearby or manufactured by companies located a few kilometres from the village, allow the injection of local economy, favour the development of the sector and have allowed the training of the inhabitants and some craftsmen (manufacture of adobes, masonry in adobes and BTC, training in earthen plaster, etc.). While imported and/or manufactured materials enrich the industry, building with local, bio- and geo-sourced materials enriches the economy and knowledge of the local population and small craftsmen.

As far as costs and salaries are concerned, the entire project management was done on a voluntary basis. The craftsmen and inhabitants were paid on a daily basis as is customary in the country. Again, the aim was to pay the villagers, to inject local economy and to provide employment.

Circular design

Eco-design :

The simple volume of the building allows its mutability, which is already visible today. The large main hall, the refectory, can be used for parties, as a classroom, a library or as a cool, shady break area. The large terraces become real living spaces at break time where children play and sit.

The bio and geosourced materials used (clay, typha, earth from the site) are entirely recyclable. Thus, the circular life cycle is ensured and the return to the soil is possible. Moreover, if rainfall over the years erodes the plaster, adobe or typha acoustic panels, the material can be reused to protect the building again.

Sustainable supply :

Water and electricity were supplied directly on the school grounds, in the adjacent vegetable garden, via a well, filled with a pump connected to solar panels.

Health and comfort

Comfort

Temperature level :

Unlike the classrooms at Louly School, which are built of cinder blocks and sheet metal, where the temperature often exceeds the outside temperature due to poor air circulation, the canteen is widely ventilated and the hot air is evacuated through the roof.

In the enclosed spaces, the addition of light earth-typha panels and the earth-typha slab floor insulate the building and reduce indoor temperatures.

The vegetation planted around the building already provides shade on the sun-exposed facades. Planted along the posts supporting the shade of the outdoor terrace, the bougainvillea plants are beginning to spread over the structure and when the foliage is dense enough, the vegetation will provide ample shade for the terrace.

Humidity control :

The characteristics of the earth and the plant fibres allow the regulation of hygrometry and humidity. In order not to block the exchange of vapour between the interior and the exterior, the renderings have been stabilised with lime and not with cement (which tends to limit the exchange of gases and to "detach" from the earth, encouraging condensation).

Acoustic comfort :

Plant fibres also have very good acoustic properties. The earth-typha slab roof slab therefore increases the acoustic comfort in the dining room.

Visual comfort :

The woven kinkeliba joinery (wood harvested in the village with the inhabitants) allows the space to be enclosed, both spatially and visually. Thus, the dining room can be closed and the density of the weaving allows for privacy inside.

The moucharabiehs allow views to the outside while protecting the users inside thanks to the small size of the openings.

Ergonomic design :

The stabilised BTC base walls are built to a height of four bricks, the height of a chair. Thus, in addition to protecting the mud walls, they become seats, benches for the kitchen and seats for the children to sit on, either alone or in groups.

Contest

Reasons for participating in the competition(s)

We are convinced of the role of architecture and the architect in the ecological transition, especially in developing countries.

Senegal is a country that has placed cement as the main material for the transition to modernity. The country is covered with concrete everywhere and is abandoning the local resources traditionally used. Whereas everyday constructions used to adapt to the resources available in the vicinity, were established in their territory and adapted to their climate, the widespread use of cement and sheet metal has modified Senegal's built landscape, led to increasingly high construction costs, thermal discomfort and a growing disappearance of ancestral know-how. Despite this, the race to modernity and the image of construction

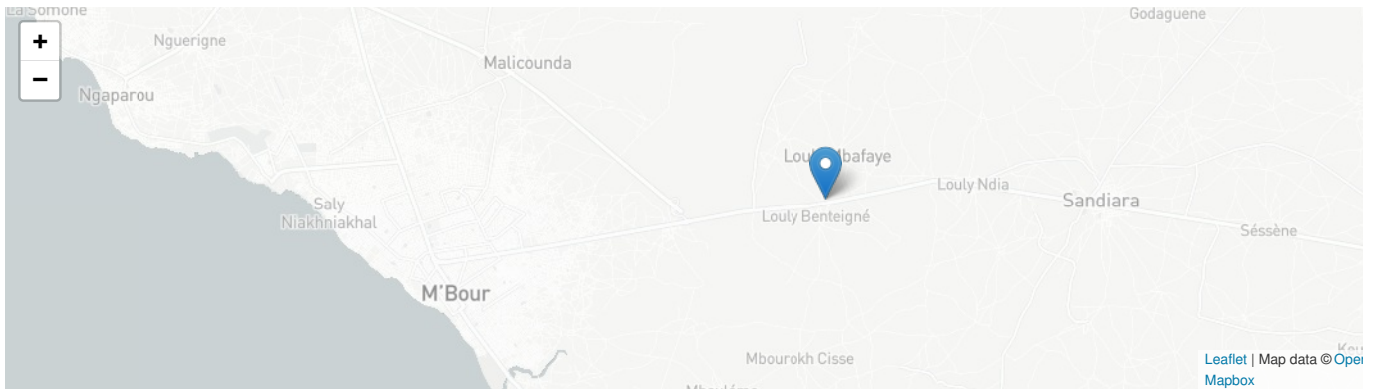
dominate.

La Cantine de Louly takes the opposite approach to this architecture, which is spreading throughout Senegal, while adapting to the skills that have been developed. Thus, the use of cement is reduced and the material finds its place according to the saying "the right material in the right place".

In contrast to the buildings in the village, where earth has completely disappeared, the earth masonry in the canteen is showing itself and trying to give a new image to this neglected and yet widely available material. Plant fibres, and more particularly typha (an invasive reed from the north of Senegal known for its highly insulating characteristics and its resistance to termites), ensure greater thermal comfort and make it possible to maintain a more appropriate hygrometry and temperature in these enclosed spaces, out of water.

Finally, the design of the building itself has been adapted to the constraints of the area, with regard to rain and wind, by means of a stabilised base, large roof overhangs, a raised roof, moucharabieh walls, woven wood joinery, etc.

Finally, it is the "sharing" and the "together" that makes this canteen a frugal project. Hand in hand, students, craftsmen, inhabitants and volunteers have built this canteen. After numerous discussions, presentation workshops and immersions in the village, the design of the canteen evolved on the spot to adapt to the habits, desires, needs and know-how of the people and the main users, the mothers, children and teachers who would benefit from this canteen.



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