



2016 On Site Review Report

by Tomà Berlanda

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Thread Cultural Centre

Sinthian, Senegal



Architect

Toshiko Mori Architects

Client

American Friends of Le Korsa, Josef and Anni Albers Foundation

Design

2013-2014

Completed

2015

Thread Cultural Centre

Sinthian, Senegal

I. Introduction

Thread, designed by Toshiko Mori Architects (TMA) in 2012 and completed in 2015, is a cultural centre and artists' residency for the small village of Sinthian, in the Tambacounda region of southeast Senegal. Located next to a health centre, the only one with a doctor in a range of 60 kilometres, it complements its activities by bringing full-circle the notion of culture as means to provide a holistic and socially just approach to health, education, nutrition and entrepreneurship. Built with local materials and limited resources, it provides a flexible space for a multiplicity of purposes, under one large rainwater-catchment thatched roof, that revolves around two open courtyards. The Centre hosts both local and international artists, as well as providing much-needed support for educational and agricultural activities.

II. Contextual Information

A. *Brief historical background*

The Tambacounda region, formerly known as "Sénégal orientale", occupies the eastern part of Senegal. Physically it is the largest of the country's regions, but sparsely populated. Historically, before colonial rule, it was part of the Mali empire, and much of its rich djembe (hand drum) and dance culture and heritage come from Mali. The local economy is based primarily on agriculture, particularly cotton and peanuts. Ethnically, it's one of the most diverse regions of Senegal, with more than 12 tribal lineages present. Religion depends on ethnicity, and the majority of the population, the Polars, are Muslim, whereas the Bassari group are predominantly Christian.

Sinthian is a village roughly an hour's drive south of Tambacounda, the regional capital, 400 kilometres east of Dakar. It sits in the geographical centre between four other villages, in what is known as "la zone bananière", a large cooperative banana plantation, active since 1993. Today Sinthian is the home to some 800 inhabitants, more than half of whom are children. The village is ruled by a chief, who operates in conjunction with the marabout, the Muslim spiritual leader of the community. There is both a pre-primary and a primary school. The main civic infrastructure is a health centre, the "Maison médicale mutualiste de Sinthian", the largest medical facility, and the only one with a doctor, in the entire sub-prefecture, one that serves, on a cooperative membership basis, 500 families across the area.

B. *Local architectural character*

The majority of the houses in the village are built out of mud bricks. Some few constructions are built using cement blocks. Almost all the roofs have a wooden structure, and are finished with thatch, with a few exceptions that use metal sheeting. All the buildings are grouped in fenced compounds, and create a nuclear structure where extended families live in close proximity. The settlements are few kilometres apart from each other, and interspersed by agricultural terrain and the bush.

C. *Climatic conditions*

The prevailing climate is known as a local steppe climate. The region is mostly dry for seven months a year, between November and May, and rainy during the winter months ("hivernage") that run between June

and October. The average rainfall is around 800 mm per year, with most of it falling in August. During the dry season the average daily temperature is in excess of 40°C, whereas during the rainy season it becomes cooler, although very humid. At times a breeze comes from the west, from the Gambia River, which is five kilometres away.

D. *Site and surroundings*

The site lies on the western edge of Sinthian, almost where the fields end and the bush, with its many baobabs and acacias, starts. Access to the village and the site is by dirt road only, and, indeed, the earthy patches and sand stretches are the main feature of the landscape, alongside tall termite mounds. The compound is enclosed by a metal-wire fence. A large scale cellular tower stands next to it, almost the only symbol of “modern” infrastructure.

E. *Topography*

The site lies on a fairly flat bush terrain, a few kilometres east of the shores of the Gambia River. The soil is porous, mostly laterite and clay.

III. Programme

A. *History of the inception of the project; how the project was initiated. How were the architects and specialists chosen?*

The existence of the NGO, American Friends of le Korsa (AFLK), dates back over a decade, to 2005, when Nicholas Fox Weber, the executive director of the Josef and Anni Albers Foundation met Dr Magueye Ba, a Senegalese doctor who had decided to commit to living in Sinthian and improving the local population’s access to medical services. The partnership between the two was instrumental in securing donations and funding in support for the activities that a French NGO, le Kinkeliba, was running in the region, particularly in providing modern medical practices in rural areas. This subsequently led AFLK to support Dr Ba in the establishment of the health centre in the village of Sinthian, the only one with an in-house doctor within a range of 60 kilometres, and the growth of its activities. With the upscaling of operations, the opportunity came to diversify the scope of the interventions. In 2010, for instance, the NGO was instrumental in opening the pre-primary school in the village. The project for a cultural centre, that is now Thread, germinated out of the involvement of Toshiko Mori in the activities of the Albers Foundation and AFLK. In particular, in her role as Professor of Practice at Harvard University’s Graduate School of Design (GSD) she led two consecutive studios (2009 and 2010) to Tambacounda and Sinthian, inviting students to develop programmes and projects that would loosely fit the brief of generating a community development and facilitating the role for architectural elements in having an impact on the social dynamics of the village. Jordan McTavish, the project architect, was a student in one of those studios, and when he went to work for Toshiko Mori Associates, he had the opportunity to continue on the design work for Sinthian. In 2014, Thread was established as an NGO in its own right to manage the Centre, in conjunction with AFLK and the Albers foundation.

B. *General programme objectives and functional requirements*

The programmatic brief is quite essential: one large open and covered space, and two artists’ residencies, all under a large, rainwater-harvesting roof that reinterprets the traditional impluvium houses of the Casamance region, in the southwest of Senegal. The main building is complemented by one large and three small bungalows, which offer accommodation for Thread’s managing director and staff. The overall plot size is

6'232 m², roughly a rectangle of 120 x 50 m. From the beginning, the idea was to create a community centre that would be flexible for a multiplicity of stakeholders. In particular, the notion of “culture” and “cultural centre” were used to informally describe a variety of activities that could run simultaneously, without any overarching structure. Since the opening, in March 2015, thousands of people have been able to just walk in, discover the facility as a space for exchange, and develop their own sense of ownership of it.

IV. Description

A. Building data

The main building is essentially a 1'000 m² roof. Designed through a “parametric transformation of the traditional pitched roof”, it generates a figure-of-eight-shaped geometry that inscribes two elliptic courtyards where rainwater is collected and channelled into two ditches that lead to the two, 570 m³ water reservoirs. The two artist residencies are located in large rooms located under the roof, at the opposite corners of each short edge of the building. Roughly 20 m² in size, they are comprised of a kitchen corner and an en-suite bathroom, and each open up to one of the courtyards.

B. Evolution of design concepts

Response to physical constraints

The centre is a rectangle 50 m x 20 m in size, oriented with the long side on a north/south axis, and placed in the centre of the plot. There were no specific zoning requirements to meet. The plot shares its eastern edge, as well as water and sewage infrastructure, with the health centre compound, from which it is separated by a fence and a gate.

The original massing was much more complex, but during the course of 2012, Toshiko Mori travelled to Sinthian twice, and discussions there led to simplifying and refining both the massing and the roof structure quite a few times, using local knowledge as a sounding board for the design process. Overall, the siting is a fairly generic response to the available plot, although it does facilitate the cross ventilation of the main open space, by privileging the short span in the east/west direction and offering very few possibilities for the rays of the hot noon sun to penetrate into the structure.

Response to user requirements

AFLK's initial brief loosely called for an artist residence component and a joint programme with the medical centre. The idea of providing a very open flexible space was the response to accommodate as many uses as possible. On the plot, there is one bungalow located by the entrance gate on the northern edge, which offers a space for the caretaker. Moving past the building, to the southwest corner of the plot, the three bungalows for the managing director and other staff members are located. The two water reservoirs are located on each long side of the building, adjacent to its plinth, and organise the longitudinal movement around it.

Purely formal aspects

From a distance, the main feature of the building is definitely its thatch roof. Its undulating sinuous geometry, varying pitch and material articulation capture the eye, and allow it to wander around the building. The elliptical void created by the two oculi enriches the roofscape, and the general slight asymmetry of the entire composition adds to the intriguing and dynamic vibe. The irregular shape and rhythm contribute

to the distinctive aesthetic of the space. The underbelly of the roof becomes a woven landscape which constantly catches one's attention. Along the elevations, the perforated pattern of the white-washed walls creates a strong textural bas-relief sensation that is both aesthetically and climatically very effective. The entire structure is fairly abstract in its articulation, interplaying geometrical motifs in the ventilated walls and door finishes, that recall some of Josef Albers's work, to the more extrovert fragmentation found in the broken tiles that are embedded in the floor screed.

Landscaping

The main landscape feature of the design is created by the cement pathways that extend the curved geometry of courtyards across the plot. In the overall site plan it is conceptualised to encompass both Thread and the medical centre, although this is currently only limited to the Thread side of the site, limiting the connection between the two functions to a central gate. As part of its operations, and thanks to the particular agricultural skills of staff members, the Centre has started to grow vegetables on site, and to organise a composting garden. Using the water collected in the reservoirs, every morning and every evening a group of women irrigate the crop beds, and this allows for the sustenance of the food production.

C. Structure, materials, technology

Structural systems

Set above a concrete ring-beam foundation, the vertical loadbearing system is made of compressed-earth block walls and concrete columns and beams. The roof structure is assembled through primary steel members, and secondary wooden purlins and rafters.

Materials

- Structural members
Compressed-earth blocks assembled with mortar, and concrete columns.
- Renderings and finishes
All the vertical surfaces (walls and columns) are plastered and painted white. The roof finish is thatch. The floor is beautifully articulated, embedding broken shard of tiles, the cast-offs of local production from a Tambacounda factory, in a cement screed.

Construction technology

The technology adopted is a conventional vertical masonry loadbearing system that supports a metal primary roof structure. On top of this, the wooden rafter and bamboo purlins support the thatch roof.

Building services, site utilities

There are few services available. The electricity is generated through a solar power plant. The piping runs inside the walls and is concealed within the roof structure. Running water is extracted with a solar-powered mechanical pump from a ground well in the medical centre compound and distributed to all the toilet points. There are two septic tanks that are shared with the health centre.

D. Origin of

Technology

Technology is mostly adapted from what is available on site. The compressed-earth blocks were produced manually with three metal moulds specifically designed for the project. The three sizes and different mixes of material employed were:

- curved bricks for the elliptical walls around the courtyard, 40 x 20 x 15 cm, using mostly sand and little cement
- cubic bricks for the main wall structures, 40 x 20 x 12 cm, mostly lime
- elongated bricks for the ventilation screens, 40 x 10 x 10 cm, using a 3:1 sand:cement ratio.

Materials

All of the material was sourced locally, and even the metal elements came from the mining region around Tambacounda.

Labour force

Dr Ba operated as general contractor and coordinator, and relied on team leaders for the different types of work to be carried out: masonry, metal works, carpentry, roofing. Most of the labour force was local, except the lead roof assembler, Gregoire Bienquench, a Bassari from the Kedougou region. In total, over 40 people were employed at various stages during the construction.

Professionals

Architects: Toshiko Mori Architects is based in New York, USA.

Contractors: Even though he had no previous experience in construction, Dr Magueye Ba acted as general contractor himself, organising labour and procuring material. He found the drawings received from TMA very clear, and was able to interpret them precisely enough for the purposes of erecting the structure. For the cost estimates, he was assisted by Thiam Cheikh Sidarth, a local engineer in Tambacounda.

Consultants: Structural consultancy services were provided by Michael Stein from Schlaich Bergermann and Partner in New York.

V. Construction Schedule and Costs

A. History of project design and implementation

2010: GSD design studio in Sinthian, idea for the project.

2012: Funding is secured from the Albers Foundation and official commission awarded. Conceptual design is refined with two visits on site.

Late 2013 / early 2014:	Schematic design phase. During six months, Toshiko Mori Architects works to deliver a design development document to the clients and Dr Ba.
February 2014:	Commencement of construction.
July 2014:	By the beginning of the rainy season, foundation and walls and the main loadbearing structure of the roof are in place. Jordan McTavish from TMA visits the site twice, once after the completion of foundations, and the second time after the roof structure is in place.
November / December 2014:	At the end of the rainy season, the roof thatch is put in place, and the interior works continue, with the tile pattern and floor finish, plumbing, interior, mill work, kitchen areas.
March 4, 2015:	Opening with 2'000 visitors and all the chiefs of neighbouring villages and local authorities.

B. Total costs and main sources of financing

Total construction costs amounted to 146'000 USD (87'112'483 XOF). The financing was provided by foreign donors.

Land was donated by the community.

C. Qualitative analysis of costs

The square metre cost is 102 USD (59'223 XOF), nominally fairly low, although reflecting a space which is mostly open. Compared to a traditional structure in Sinthian, this is probably quite expensive, although, on the other hand, it helped generate a temporary income for many families in the village.

D. Maintenance costs

There are no direct maintenance costs in terms of heating and cooling.

E. Ongoing costs and “life performance” of building

The roof is the main “live” element of the building. It is estimated that the thatch needs to be maintained and replaced every three years, whereas the bamboo joists will probably have to be replaced on a 10-year cycle. After one full year of operations, the structure is still in a good shape, although there are few points in the roof where there is leakage.

VI. Technical Assessment

A. Functional assessment

The centre has been fully operational since its opening, in March 2015. The artists' residencies operate at full capacity, and welcome artists from both Senegal and abroad for four-to-eight-week stints. The village

has fully embraced the Centre and its activities, particularly since they conceive of it as an extension of the medical facility, to which they already relate, and they see the tangible benefits it is bringing to the community. In particular, the local youth like the centre in multiple ways:

- as an extension of the classrooms;
- as a space to study in the afternoon;
- as a recreational venue where they can play;
- and, mostly, as a platform for artistic expression.

The two courtyards lend themselves ideally to becoming stages for performances, nurturing the local appetite for creativity.

Normal operations occur daily, seven days a week. The plan is to close during the Ramadan month, which in 2016 will be from June 7th to July 6th, and then stay closed until the end of July, to allow for staff vacation. Otherwise there are no particular rules.

B. *Climatic performance*

Both the extreme weather conditions in Sinthian, and the scarcity of available resources are well-mitigated by the simple design and technology employed. The perforated walls provide natural ventilation and light, and mosquito nets keep out insects. The thatch roof provides good protection from the direct sun, and the modulation in height facilitates both the air flow as well as allowing for an overall dampened acoustic.

C. *Response to treatment of water and rainfall*

One of the main features of the design is the rainwater-harvesting roof, which fills two underground water reservoirs of 570 m³ each. At an average consumption of 3 m³ per day, they are able to provide irrigation water for seven months/year, and the rest will be covered by the rainy season. One of them suffered from poor reinforcement in the concrete walls – the original specifications were disregarded on site, and this led to a partial collapse in the first rainy season, but has now been attended to with a complete overhaul of the reinforcement.

A solar pump extracts water from the well at a maximum capacity of 40 m³ per day, and fills a 6000-litre tank from which the system is gravity-fed. The wastewater treatment is organised by connecting the centre to two septic tanks of the health centre. Detailed information on their specifications was not available, but the general sense is that not much research went into exploring alternatives to large toilet flushes and the possibility of building more refined phyto-depuration or natural waste-water treatment that could be used for surface irrigation.

D. *Environmental response*

The carbon footprint of the centre is low, considering that most of the vertical structures are made of compressed-earth blocks fabricated on site, and that, similarly, the entire bamboo and thatch roof was sourced locally. Furthermore, the rainwater catchment strategy allows the use of the collected water for irrigation purposes, thereby ensuring an eco-systemic integration with the surrounding environment.

E. Choice of materials, level of technology

The choice of materials is particularly appropriate and in line with local traditions and capacity. One of the most striking pieces of evidence for this is that Dr Ba has been able to replicate the use of perforated-brick walls when he assisted in the construction of the building.

In terms of the roof assembly, the original design, while allowing for quite a lot of flexibility for connection details such as those between the bamboo and the inner ocular frame, did not envision the use of steel beams, which were added by the local team who did not want to risk using only assembled bamboo beams for the entire roof frame. This is now “concealed” from view. Although there is a strong tradition of pottery in the village that has not been directly tapped into by the project, it is now becoming an element of the art installations in the courtyard.

F. Response to, and planning for, emergency situations

The centre is on a plinth, raised about 50 cm from the ground. This facilitates both water collection and canalisation from the roof, and ensures that during the heavy rainstorms the floor stays relatively dry.

G. Ageing and maintenance problems

As a result of the geometrical manipulation of the pitch of the roof, there are four weak spots in the overall scheme where the roof leaks. They are located outside the artist residencies in the communal space, and what happens is a result of the water-shedding being not as effective as it should be, since the pitch is lower than the traditional rule of thumb. In general, however, there are no particular signs of ageing, and maintenance is made relatively easy by the fact that the majority of the building crew lives in the village, and can be called on at short notice.

H. Design features

The Centre is well-integrated with the surrounding landscape. In particular, the sinuous thatched roof allows it to blend in with the vegetation and the prevalent tints of the sand.

I. Impact of the project on the site

Thread is clearly a focal point and a catalyst of attraction for the village and neighbouring communities, although this has not translated itself into a requirement for infrastructural change. There are very few cars that move through, and most of the population moves either on foot or on bicycles.

J. Durability and long-time viability of the project

The activities of the Centre rely on foreign donors to function. A good part of Nick Murphy’s work as director, is dedicated to fundraising so that it can operate and expand its reach. The target is to raise two million USD to support operations for the first five years (2015-19). On the other hand, the local programmes, beyond the cultural activities, are dedicated at empowering local inhabitants to generate income by introducing gardening and farming techniques and facilitating the creation of cooperatives. Two one-hectare plots have been secured by Thread, one in Sinthian, and one in the neighbouring village of Dialiko, and allow for a total of 280 women to engage in agro-forestry, tree nursery and agricultural activities. This generates an income

for each one of them that helps support access to children's education and health services. Furthermore, an apiculture project next to the centre is about to start and will involve 20 men from the community. Projects such as these are initiated by Thread, discussed in consultation meetings with villagers and stakeholders, and then, only when there is buy-in from the community, implemented.

K. *Interior design and furnishing*

The Centre uses locally produced wooden furniture, mostly chairs and small low tables, that blend in very well with the overall aesthetic. The quality of the interior finishing of the kitchen corners and the bathrooms is not excellent, but allows for practical heavy use, and limits the need for maintenance. In the southwest corner, Thread places an open bookshelf, which allows children and community members, as well as artists, to peruse educational texts and reference books on Albers' work. Overall the feeling is a little rough around the edges, in contrast with the abstract precision of the lithographs of Josef and Anni Albers' work which hung in their frames on the walls.

VII. Users

A. *Description of those who use or benefit from the project*

The inhabitants of Sinthian are obviously at an advantage compared to neighbouring villages because they benefit from the presence of the medical centre. The centrality of its activities, and the impact they have on the life of the community at large are significant, in as much as they speak of a notion of health that goes beyond the simple act of curing diseases. The entire set of operations of the Centre, and its holistic partnership with Thread, ensure that health, hygiene, education, agriculture, nutrition, entrepreneurship, art and community empowerment are different declensions of the definition of "culture".

B. *Response to project by clients, users, community, etc.*

What do architectural professionals and the cultural "intelligentsia" think about the project?

The project has been well received internationally, awarded a prize by the AIA NY in 2014 and selected for the Venice Biennale in the same year. It was also included in the Africa: Architecture, Culture, Identity exhibition at the Louisiana Museum of Modern Art in Denmark in 2015.

What is the popular reaction to the project? What do neighbours and those in the immediate vicinity think about the project?

During my two days on site, I was able to meet with both the marabout, the spiritual leader of the community, as well as the village chief, and to interact with a number of inhabitants. They both expressed great pride in Sinthian being the home for the centre. They see the inhabitants' engagement in the centre's activities as beneficial, and also they are able to resort to the centre and its staff to facilitate and promote initiatives that improve the general well-being. Particularly praised were the support to the school's operation, and the income generating agroforestry activities.

VIII. Persons Involved

AFLK – Josef and Anni Albers Foundation

Nicholas Fox Weber: Executive director

Thread (running the operations)

Nick Murphy: Director

Moussa Diogoye Sene: General manager

Habib Dieye: Coordinator of agricultural projects

Augustin Diouf: Assistant coordinator of agricultural projects

Brian Harris: Agricultural and cultural coordinator

Toshiko Mori Architects

Toshiko Mori: Principal

Jordan MacTavish: Project architect

Schlaich Bergermann and Partner (structural engineers)

Michael Stein: Managing director

Dr Magueye Ba: General Contractor and Director, Maison medical mutualiste de Sinthian

Pepe Ndiaye: Chief mason

Elhadjil Kante: Chief brick-maker

Gregoire Bienquench: Chief roof-constructor

IX. Bibliography

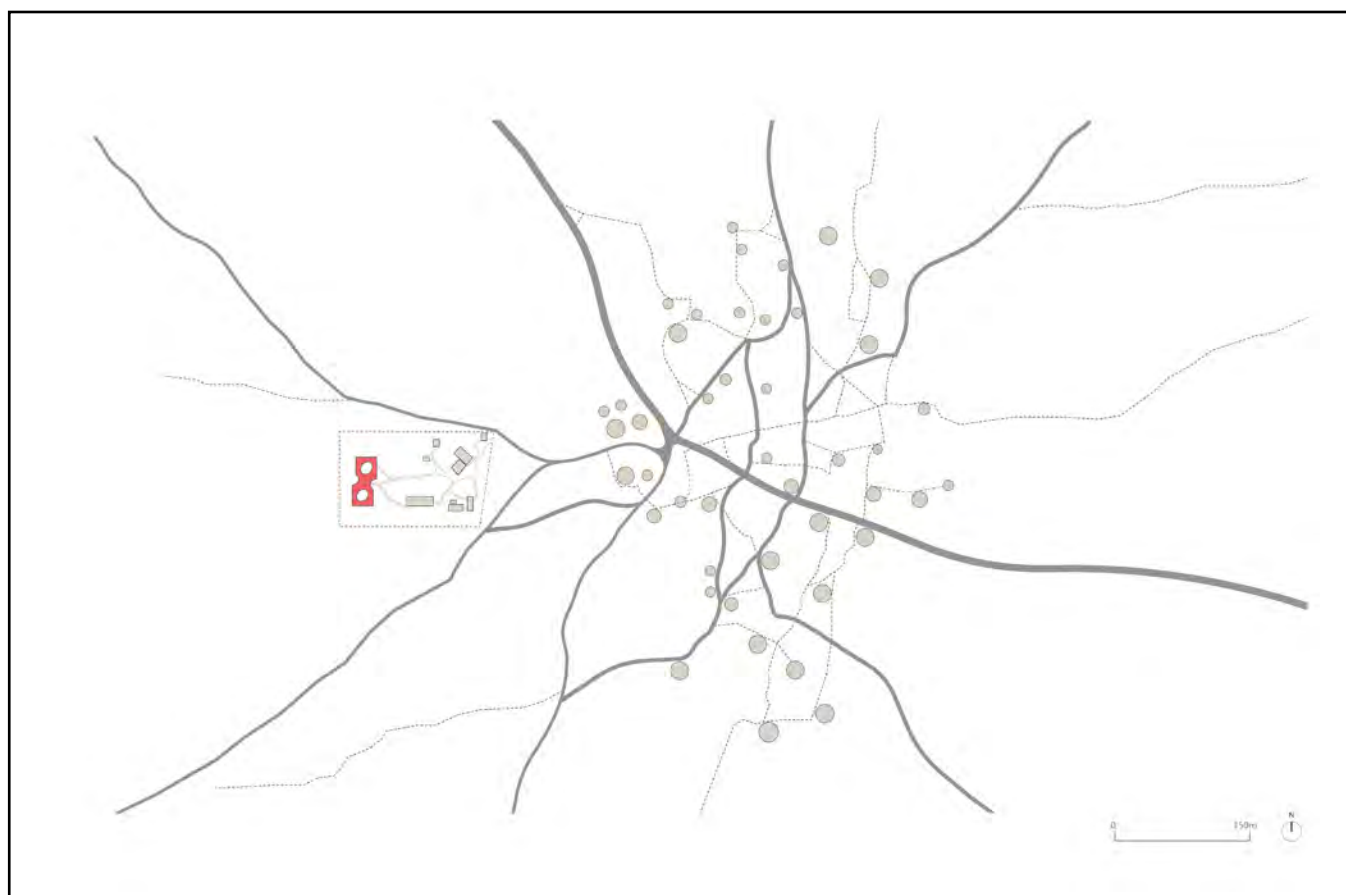
- Ellis-Petersen, H., Parched Backwater in Senegal Where Local Traditions and Modern Art Collide, *The Guardian*, 20.3.2015
- Thread Artists' Residency, *Arquitetura & Urbanismo*, July 2015
- Fixsen, A., Thread: Artists' Residence & Cultural Center, *Architectural Record*, vol. 203, n. 6, June 2015
- Low Impact, a Well Connected New Community Centre in Rural Senegal Has High Ambitions, *Wallpaper*, 2015

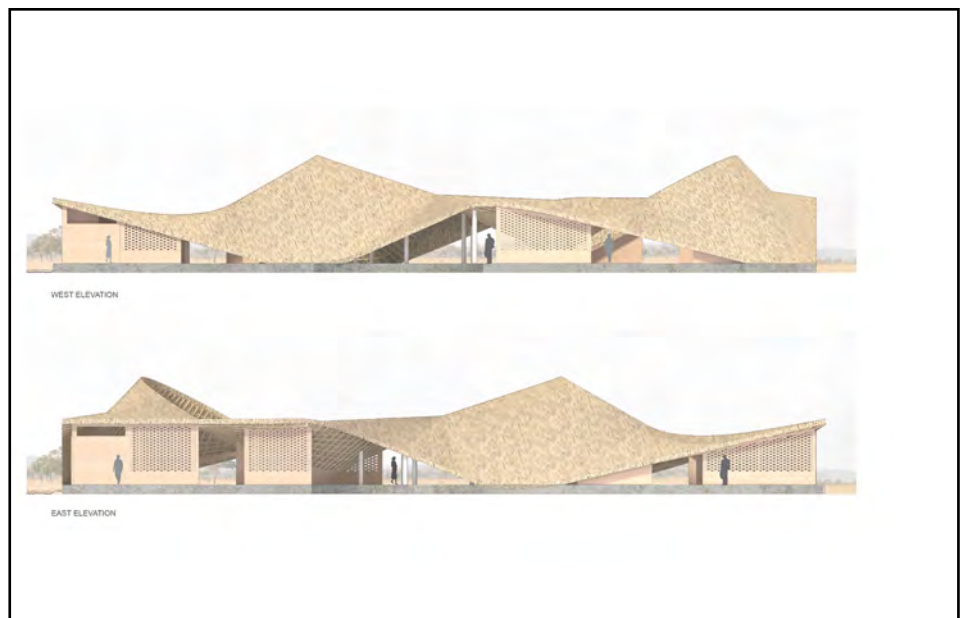
The project has been included in exhibitions and catalogues, including:

- Holm, M. J., Kallehauge, M. M. (eds.), *Africa, Architecture, Culture, Identity*, Humlebaek: Louisiana, 2015

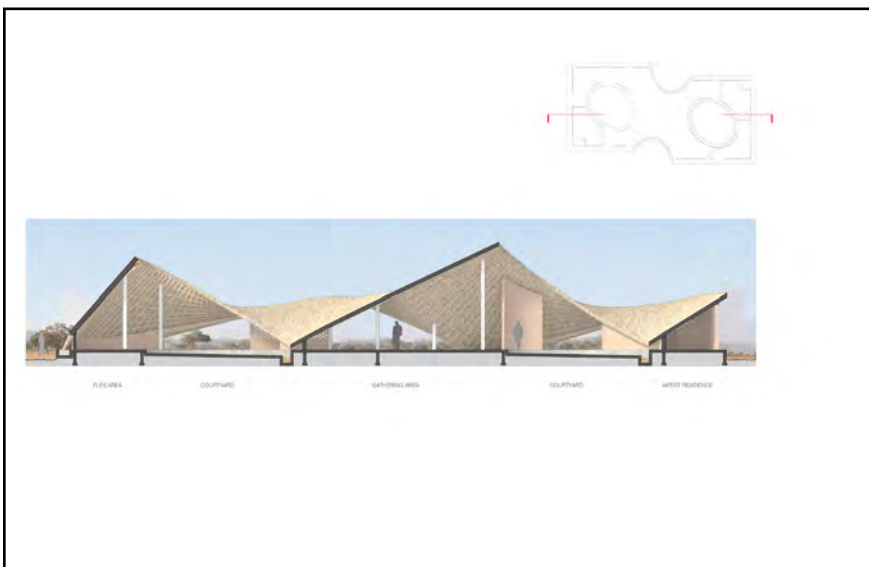
Tomà Berlanda

May 2016





Rendering of the building elevation.



Rendering of the section.



The main feature of the building is definitely its thatch roof. Its undulating sinuous geometry, varying pitch, and material articulation capture the eye, and allow it to wander around the building. It also provides good protection from the direct sun, and the modulation in height facilitates the air flow.

The centre consists into one large open and covered space, and two artists' residencies, all under a large rain water harvesting roof that reinterprets the traditional impluvium houses of the Casamance region.





As part of its operations, the centre has started to grow vegetables on site. Using the water collected in the reservoirs, every morning and every evening a group of women irrigate the crop beds, and this allows for the sustenance of the food production.



One of the main features of the design is the rain water harvesting roof, which fills two underground tanks water reservoirs and provide irrigation water for 7 months/year. One of them suffered from poor reinforcement in the concrete walls but is now been tendered to with a complete overhaul of the reinforcement.



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In the south west corner Thread places an open bookshelf, which allows children and community members, as well as artists, to peruse educational texts and reference books on Albers' work.

The two artist residencies find place in large rooms located under the roof, at the opposite corners of each short edge of the building. The perforated walls provide natural ventilation and light, and mosquito nets keep out insects.

