



Shiyala School (view from the central courtyard)

Shiyala School

Orkidstudio

Ten years after they were originally built, the classroom blocks that made up the Shiyala Primary School, stood derelict. Despite a skilled local workforce in earth-brick production and masonry work; both structures suffered from under-engineering, poor maintenance and lack of financial support. With a minimal budget, Orkidstudio converted the existing structures into a colourful primary school.

Taking cue from the fragile foundations already in place and a very tight budget, the roof structure is removed to relieve any unnecessary weight on the walls. A new super-structure is created around them in the form of rammed-earth-filled steel drums which are retained as a permanent formwork, both to protect from the elements and act as tensile reinforcement. Similarly, sections of the existing brick walls are cut away to receive the new columns. As the drums take on a compressive role, the masonry resists shear forces without the addition of extra cross-bracing.

The first phase entailed transforming two blocks of classrooms, a small library, a new block of solar-assisted toilets and teachers' accommodation. The second phase, completed in 2017, included a third block of classrooms, a new accessible block of toilets, a staff office and landscaping & rainwater management infrastructure.



Southern classroom block elevation



School builders from the community



Construction of Phase II

#2

The community members, including students, teachers, parents and the local workforce -many of whom had children attending the school- were an integral part of the design and construction. Although this approach was constant since the beginning, it became more evident with the phasing of the project. Since the community was able to test the buildings for a year, they were then able to share with us feedback on how they intended to use the spaces, which helped us to adapt the design to best suit their needs.

The availability of a skilled local workforce in earth-brick production, masonry and steel-welding provided a growing foundation from which we could involve the community and bring social change -most particularly in the case of women- as the more skilled workforce quickly passed on their construction skills to the less experienced members of the team. The unexpected speed at which this skills-transfer happened allowed us to accelerate the construction while training new techniques amongst the wider workforce, regardless matter sex or age. This supposed not only a new source of income. For many, this was a chance to learn new skills and develop a sense of confidence to learn and work in new environments.



Local workforce learning plastering works

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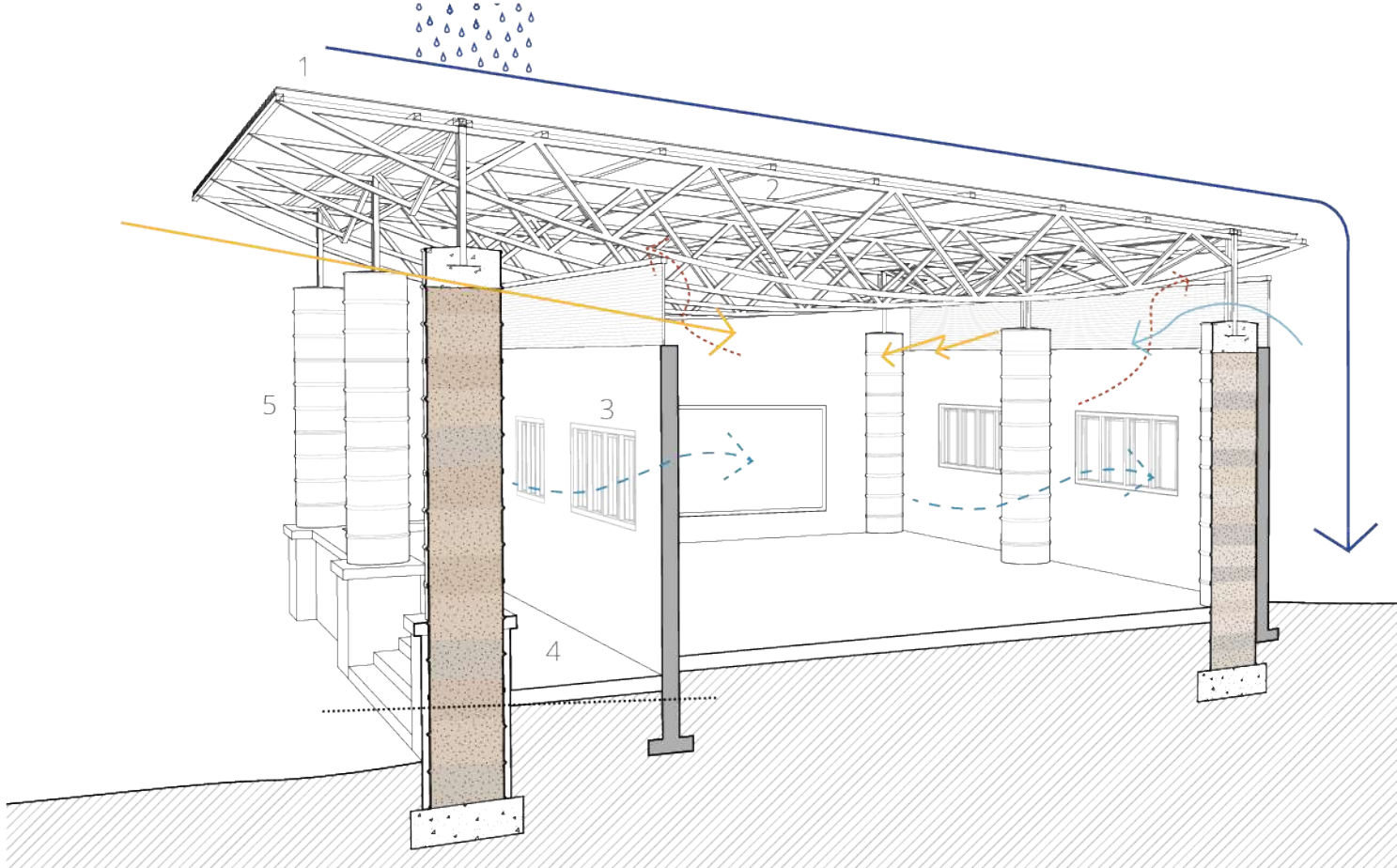
Classroom (interior) during construction



Classroom block



Eco-swale (rainwater management)



Typical classroom section

#5

The new classroom roofs replace the semi-collapsed pre-existing ones, and offer generous passive shading during Zambia's hottest months, with an air gap between the walls and roof for increased airflow and natural lighting.

The use of rammed-earth filled steel drums as part of the surrounding superstructure that supports the new roof -acting as tensile reinforcement while the walls resist rear forces- enabled a significant reduction in costs and waste, since it avoided the complete demolition of the pre-existent structures while recycling second-hand oil-drums. On top of that, most of the materials were sourced from around the vicinity and utilised the skills of the local workforce.

The landscaping works promote a more sustainable rain-water management system and reduce soil erosion. They included the plantation of new trees around the compound as well as the provision of two eco-swales -to collect and absorb excess water- connected by a channel where members of the community imprinted their initials.

Overall, the renovated school features a modern and playful appearance, yet it considers the pre-existing structures and the natural and socio-cultural context, featuring an alternative to the traditional design of schools and taking advantage of the locally available materials and skills.

1. The angled roof provides protection from the hot sun and heavy rains of Zambia.
2. An air-gap between the roof and walls as a passive cooling strategy.
3. Windows with playful safe bars allow for light and extra ventilation.
4. Public verandah.
5. Columns: rammed earth inside recycled oil-drums



View of the central courtyard



Public seats (recycled oil drums) and library block



School campus plan

#10

The Shiyala school was one of many overpopulated schools in the district and had been running for over ten years. But the lack of maintenance and under-engineering meant the school had reached a point where the buildings were on the brink of ruin, threatening the safety of the students and ending up being unutilised. With a large young population eager to attend school and aiming to exploit the existing resources in the community, renovating the existing facilities and building new ones required an unconventional approach.

The new classroom blocks provide a safer, healthier and vibrant space that is conducive to the children's education. A spectrum of colour across each building creates a sense of identity between rooms. Smaller drums of varying heights are sunk into the earth as seats, gathering places, and jumping platforms.

The resulting buildings, which maintain the footprint and language of the pre-existing blocks, meet to form an inviting courtyard space that further enhances the sense of community and provides intimate, safe and joyful spaces; The project uses innovative construction techniques as well as the sustainable use of local materials and are exemplary of how to provide access to high-quality and dignified spaces with limited resources.

PHASE I

1. Classrooms
2. Library
3. Staff Housing
4. Solar assisted toilets

PHASE II

5. Classrooms
6. Accessible toilet
7. Landscaping & rainwater management

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