

TOP OF THE CLASS

Innovative use of materials guided the revamp of Jeppe Park Primary in a converted shoe factory

BY DEIDRE DONNELLY

According to Dorah Modise, CEO of the Green Building Council of South Africa (GBCSA), not only is Streetlight Schools' Jeppe Park Primary bringing healthy green spaces and green thinking to disadvantaged learners, 'it is also starting the very necessary process of greening the education sector'. She was speaking in May last year, as the school became the first in SA to be given a 4-star Green Star SA interiors rating from the GBCSA.

'Education and the environment are critical issues to our shared future,' says Melanie Smuts, founder and CEO of Streetlight Schools. 'Schools play a key role in our thinking about environmental issues, and they're legacy institutions. They should, therefore, be green, sustainable buildings.'

This passionate educator has spent some time thinking about the role of education. She was set to enter the legal profession, but volunteer work at educational NGOs during her studies showed her the severity of the country's education crisis. 'I became passionate about education and, years later, decided to open my own school,' she says.

Smuts wants to prove it's possible to offer quality education that meets global standards to underserved, under-resourced communities.

In 2013, Streetlight Schools began as an after-school programme for the community of Jeppestown, in a low-cost, mixed-use, multi-storey building in Bjala Square, owned by the social enterprise organisation Bjala. They were ready to open a primary school in 2016, but their premises needed a revamp, and funds were low.

Smuts turned to the kindness of sponsors, supporters – and kin. Specifically, her brother Albert Smuts, architect and founding partner of Fieldworks Design Group, a multidisciplinary, holistic practice that follows a 'low material, high-tech solutions' approach based on using available, environmentally friendly or recycled materials to minimise wastage. Fieldworks was 100% hands-on from inception – doing everything from drawing up the master plan and getting involved in building, to designing the urban garden, the logo and school uniforms.

The siblings worked closely on the brief, as the space had to support the school's educational approach. Its methodology focuses on exploratory, collaborative, project-based learning supported by technology, and sustainable education forms a key part of the curriculum.



PHOTOGRAPHY ANDREAS EISELEN/WHIMAGES

Naturally, learner well-being was also a priority. 'The spatial layout had to work for group-based, active work as well as individual studying, learning and reading. Because Streetlight has a progressive teaching model, translating it into a spatial design was the perfect start for an architectural brief,' says Albert Smuts.

The industrial premises – an unused shoe factory on the ground floor – delivered challenges as tricky as the cost constraints. 'The space was deep, so we had to work with its limitations to maximise natural ventilation and light, and consider thermal comfort,' he says.

His sister called on contacts from Solid Green Consulting for advice, and the school became the first low-cost project the company donated its services to. Jessé Hamman, of Solid Green, explains: 'We helped the team create an innovative educational space, and provided sustainability advice on how to optimise natural lighting, acoustics and sustainable material choices.'

The refurbishment used mostly repurposed, recycled and locally sourced materials, and it followed green construction practices. 'Construction waste management is a major concern in Johannesburg. As landfill sites fill up, waste removal costs increase, putting pressure on our environment from both a material and emissions perspective,' says Hamman.

The deepest internal space was dark, so it was turned into an auditorium, requiring less illumination. Classrooms moved to near the windows, for natural light and ventilation. To filter light to the middle spaces, multilayer polycarbonate panels were used – with several benefits. Albert Smuts explains: 'They create a cool interior, and are like coloured walls requiring no paint, so we avoided introducing new chemicals. You can see through them in one direction only, so teachers outside can monitor what's going on in the class without disrupting learners.'

The space was like a noisy echo chamber – a serious obstacle to learning. Linspace's acoustic engineers gave pro bono advice on how to develop a cost-effective, eco-friendly variation on the acoustic dampening box, using reclaimed insulation material made from recycled plastic.

'We surrounded the noisiest spaces with the classrooms and built cavity walls from drywall – almost 400 mm deep,' says Smuts. 'Outside, we filled the cavities with rock wool and covered the drywalls with perforated material. Inside is

REPORT CARD

A symbiosis of forward-thinking design and a progressive educational model



Naturally ventilated spaces meet SANS 10400-O:2011 standards. Indoor plants were included in the design.



Appliances are energy star-rated. All printers and photocopiers feature low emissions.



Water and energy sub-meters allow the school to monitor and control consumption.



Low volatile-organic-compound adhesives, sealants and carpets reduce air contamination.



The waste-management plan cut construction waste by 30%, diverting it from landfills.



Materials and furniture were mostly re-used, and sourced from the community.





good instructive space. Outside, more activity and noise can occur,' he adds.

A materials-efficient design and resourcefulness made the revamp cost-effective, and went some way towards earning the Green Star rating. The team relied on recycled materials, re-used what they could and reduced waste.

According to Hamman: 'When sourcing building materials, looking locally is a key sustainability aspect, which stimulates the local economy and lowers emissions related to construction.' The team went on a 'treasure hunt' for found objects, and relied on the community. A lot of recycling already happens in Jeppe, so they sourced many materials (as well as a third of the construction team) from within a 200m radius. For example, recovered corrugated iron was used for bathroom ceilings, reclaimed wood became the library floor and recycled wooden pallets became courtyard planter boxes.

'The entire library was made from pallets, so we built it for under R20 000,' says Smuts. These pallets – many of which were brought in by locals, who were paid per pallet – were clad in recycled materials and made into interesting nooks. Sponsors also contributed their unwanted extras, including tiles from Mazista; towers for the outside area from the Trust for Urban Housing Finance; and reclaimed rubber and carpet flooring (once old fishing nets) from



Interface. These supplies were used innovatively. The computer 'box', for example, was according to Smuts, 'constructed with standard hollow-core doors, and standard 76 mm x 50 mm SA pine-roof purlins, together with custom steel clamps commissioned from a place across the street'.

The team worked with standard material dimensions to avoid offcuts and incorporated demolition rubble into the design – as paving, in the entrance ramp and stairs, even in the kitchen and bathrooms. In total, there was a 30% reduction in construction waste.

In addition to the environmental and waste management plans, Solid Green helped make the interiors eco-friendly. The school doesn't have a surplus of taps, there are low-flow fittings and water is metered. 'Staff further educate the

QUICK STUDY:
The presence of school children has improved safety in the community, motivating the upgrade of Jeppe Park opposite Bjala Square

SOURCEBOOK

PROJECT JEPPE PARK PRIMARY

CLIENT

Streetlight Schools
www.streetlightschools.org

SUSTAINABLE BUILDING CONSULTANT

Solid Green Consulting
www.solidgreen.co.za

MAIN CONTRACTOR

Zacon Construction
www.zacon.co.za

PROJECT MANAGER

Fieldworks Design Group
www.fieldworksdesigngroup.com

ARCHITECTS

Fieldworks Design Group
www.fieldworksdesigngroup.com



children on water usage,' states Hamman, while operational waste is reduced with separation bins for recycling and composting.

Natural light was enhanced by efficient artificial lighting, and energy sub-meters monitor use of major energy sources. 'The school doesn't operate at night, so there's no excessive energy use. And all electronic equipment is energy-star rated,' Hamman explains. The printers and photocopy machines also have low emissions.

The school ensures environmental education is ongoing through wellness and sustainability programmes, and a users' guide informs occupants about local amenities, transport, and how to use the building services optimally.

The brief stipulated that the space be suited to the majority of its occupants: currently, 190 active, information-absorbing kids in Grades R to Three. One of the anchoring design features reflects this – the admin room isn't a separate

'office'; it's open to passing students. '[This design] makes teachers and staff more approachable, adding transparency. Our aim was to dedicate 90% to 95% of the floor area to teaching, with only 5% for teachers/admin. It really feels like a school for children,' says Smuts.

Indoor spaces are naturally ventilated, greened with plants, and air pollutants were minimised through low-VOC adhesives, sealants and carpets. Natural finishes and largely neutral tones (with pops of colour) were chosen to add calm, and to avoid toxic chemicals. 'The less you paint, the better. This approach is better long-term, for lower maintenance,' says Smuts.

There is a clear line of sight between the classrooms and the play space, and 'kids in the building and on the street has impacted safety in the area', according to Melanie Smuts. She says the presence of the school was a motivator for the upgrade of Jeppe Park, opposite.

Spaces serve multiple functions. 'We combined spaces, so the library has a play wall; there's a slide on the side of the auditorium; and all the circulation spaces are also play spaces. The kids get the most out of the space all the time,' her brother says. School-ground greening and a rooftop farm by Bjala bring learning about nature to life; recycling helps kids learn about waste; while art projects using discarded materials teach kids about repurposing. Quarterly reports on energy, water, waste, transport emissions, materials, recycling and nature are also prepped for learners' report cards.

Melanie Smuts says the school's 'a game-changer for the community'. It's given inner-city locals access to quality education, and created jobs. 'Often, people believe schools must be built outside the community. We've shown you can make it part of the community's fabric.'

Streetlight Schools plan to build a middle school (for Grades 4 to 7) next door, and roll out more schools, using the same model, by 2020. They've shown you can create a beautiful school with green-star 'grades' with limited resources.

'Contrary to perceptions, sustainability doesn't equate to expensive,' says Hamman. Albert Smuts adds: 'Just by being resourceful with materials [...] and having to reuse everything, it turned out to be very green. The limited budget was actually a benefit. In many ways, it's a basic approach. It's about having a robust building and using clever thinking. You can go green by just using what's already there.' 🌱