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案例 WORKS

052-115

南非伊丽莎白港郊区幼儿园

Silindokuhle Preschool, Joe Slovo West, South Africa

供稿 / Collectif Saga 建筑事务所

Joe Slovo West 属于南非伊丽莎白港郊区的一个非正式地区，是一个快速发展、不断自我更新的地区：一个永久性建筑工地。1994 年，当地政府开始了一个名为 RDP 的全国性建设计划，为每户居民建造 36m² 的混凝土住宅，以取代该地区的自建棚屋。一些居民申请轮候 10 年才获得了新的居所。

尽管居住条件恶劣，当地居民仍旧积极投身到促进社区发展的事务中。例如，当地居民 Patricia Piyani 成立了一个学前教育班和流动厨房，近十年来一直照顾社区内 1-6 岁的孩子。Patricia 自己年轻时并没有机会获得教育，这导致她投身于让社区孩子获得教育的行动中。她的创举慢慢得到认同，孩子们也越来越多，学校急需新的设施容纳更多的孩子。

自 2014 年以来，法国建筑事务所 Collectif Saga 一直在 Joe Slovo West 从事一些社区设计项目。设计团队与当地居民合作在管理区内从事不同设施的建造工作。2015 年完成了社区大厅的项目，两年后，设计团队再次返回该地区展开第二阶段发展的一部分设计工作。这一次 Collectif Saga 将为 Patricia 的学前班设计新的教室和办公室。

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1 主干道远眺景观 ©Joubert-Loots
2、3 幼儿园揭幕式 ©Joubert-Loots



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项目: 100 名儿童 (1-6 岁) 的幼儿园, 食堂和卫生设施
净面积: 220m²
所有者: Silindokuhle 幼儿园 (Npo) & Patricia Piyani (Directrice)
工程管理: Collectif Saga & Uncedo
团队: Anastasia Rohaut, Pierre Y.guérin, Sylvain Guitard, Simon Galland, Camille Sablé, Laure Rihn, Nicolas Cazé, Valentine Bruzzone, Lilia Benbelaid, Camille Mérimèche, Yannis Frémont Marinopoulos, Pierre Ciret, Mélanie Richer, David Hoar, Edward Silumko
合作伙伴: Région Pays De La Loire Département Loire Atlantique, Ville De Nantes, Tavcor Motor Group, Poise Engineering, Paterson Road Investment (Pty), Clearwater Plumbers, Dynaform
物质捐赠: Howden Donkin Fans, Mpact, Cannibal, Algoa Joinery, Nelson Mandela Bay Municipality, Barloworld Equipment, Eps
成本: 1,000,000 南非兰特 / 70,000 欧元
任务: 可行性研究, 设计, 建造
时间: 2016 年 6 月 ~ 2017 年 4 月

Program: Preschool for 100 Children (1 to 6 Years Old) + Canteen + Sanitary Facilities
Net Area: 220 Sqm
Owner: Silindokuhle Preschool (Npo) & Patricia Piyani (Directrice)
Project Managers: collectif Saga & Uncedo
Team: Anastasia Rohaut, Pierre Y.guérin, Sylvain Guitard, Simon Galland, Camille Sablé, Laure Rihn, Nicolas Cazé, Valentine Bruzzone, Lilia Benbelaid, Camille Mérimèche, Yannis Frémont Marinopoulos, Pierre Ciret, Mélanie Richer, David Hoar, Edward Silumko
Partners: région Pays De La Loire, Département Loire Atlantique, Ville De Nantes, Tavcor Motor Group, Poise Engineering, Paterson Road Investment (Pty), Clearwater Plumbers, Dynaform
Material Donation :Howden Donkin Fans, Mpact, Cannibal, Algoa Joinery, Nelson Mandela Bay Municipality, Barloworld Equipment, Eps
Costs :1,000,000 Zar / 70,000 €
Mission: Feasibility Study + Design & Building
Calendar: june 2016 / April 2017



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项目开始之前, 建筑师需要弄清楚一系列问题: 那里有什么? 什么东西可以利用? 我们能和谁一起工作? 我们需要带来什么? 我们不得不从环境中学习, 也了解了当地的一些情况。经过一系列前期工作, 这个利用当地资源和人力的项目终于得以展开。设计通过集体协商决定利用当地的回收材料以及建造技术, 并且采取先试验后施工的方法。来自城市各处的材料和物品集合在一起, 重新加以利用, 以集体的努力创造出一个全新的故事。

项目为孩子们提供了一个全新的体验, 开敞的视野、充足的光线和良好的遮阳。建筑提供了一个舒适的环境, 三间大教室自然通风并且景观开敞, 餐厅以及周边的活动场地给孩子和社区提供了一个共享空间, 支上棚子, 这里可以变成议事厅、游乐场和其他场所。建筑师还为 Patricia 和四名教师设计了一间大的办公室。这个建筑从某种角度反映了学前班的故事, 一个简单的房子背后却是大量集体智慧的结果。

回收材料进行设计

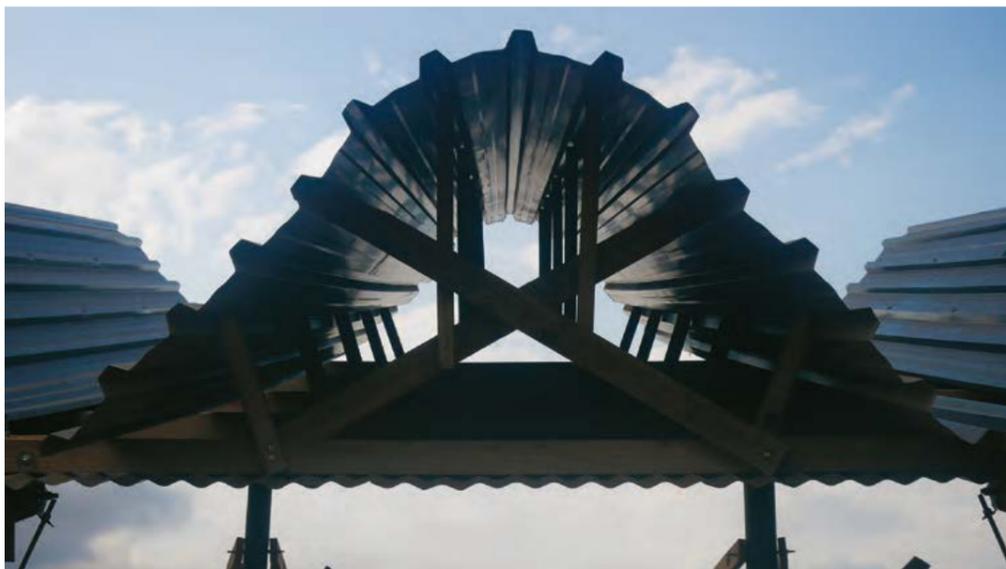
设计的同时, 我们开始收集未来会使用的建筑材料。该项目的目标之一是在施工现场展示回收再生材料的巨大潜力。这个想法是使用易于获得的废料 (调色板、瓦楞纸、废金属、纸板), 并将其用作设计幼儿园的基础。我们与当地公司建立了各种合作关系, 让我们从垃圾处理中收集材料 (大部分时间他们付款给公司去回收免费收集的垃圾)。研究了以这种方式收集的每个材料, 以确定其成为建筑元素的一部分。

第二阶段是建立一个规模的原型, 以测试这些材料的不同组合以及它们的强度和耐久性。主要的原则是选择易于复制的技术, 以便日后可以在社区成员自己的项目中重复使用这些技术。同时, 这也确保了一旦施工完成, 他们就能轻松维护设施。

一个开放的施工现场

在 2016 年 12 月至 2017 年 4 月期间, 幼儿园的建设需要四个半月的时间。它使用的资源非常有限, 由来自国际非营利组织 (Saga & Uncedo) 和社区的志愿者组成的团队进行。施工现场始终向公众开放, 不同背景的人士根据自己的空闲时间加入进来 (几个小时或几天)。一旦建设开始, 新的公共生活就发生了, 这个地方成了邻里的一个聚集点, 使各方之间进行互动。虽然施工现场是一个有很多缺陷 (噪声、灰尘) 的公共空间, 但却聚集了来自许多城市 (和世界) 各地的富人或穷人, 年轻人或老年人等等……





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- 4 食堂内景 ©Joubert-Loots
5 操场嬉戏的小朋友 ©Joubert-Loots
6 屋顶梁柱细部 ©Camille-Merimeche



在相当长的一段时间里，为了完成这一共同的目标——建造，他们的密切协作，常常需要动用手势和肢体语言。工地成为创建新关系的交流场所；连接社区并给我们自己带来新的机会。对于这些来自五湖四海、在“正常生活”中很少遇到的人们，施工过程反而成为他们彼此分享、相互联系和学习的纽带。

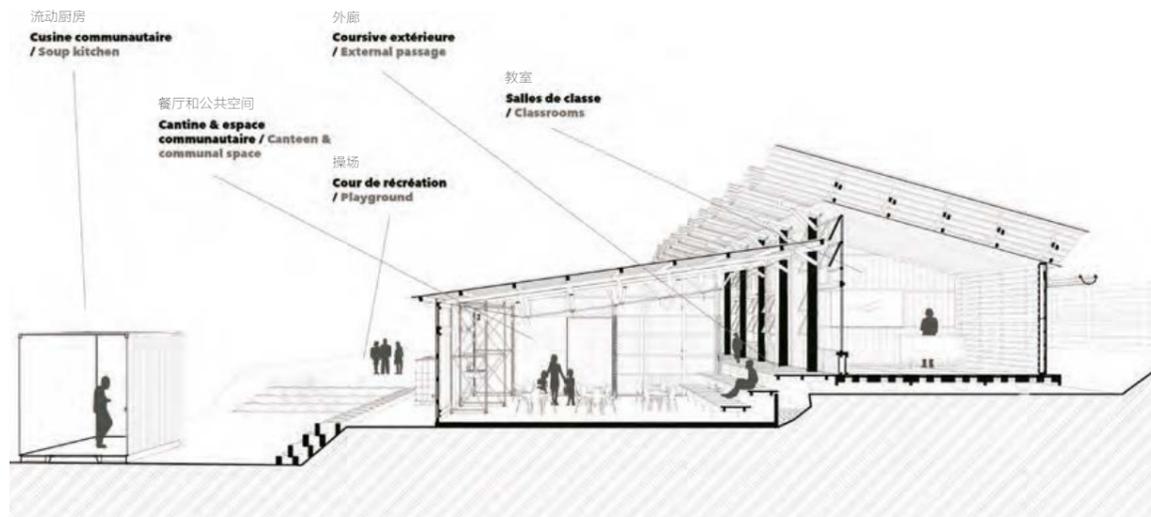
全新的建筑，更美好的未来

新的 Siindokuhle 幼儿园的建筑位于菜园的顶部，使用斜坡俯瞰现有的建筑。它朝北边有较大的开放面，以便享受观景，并最大限度地提高教室的采光利用率。在南边，建筑较封闭，保护孩子免受道路噪声的影响。

两个设施完成的空间（食堂和游乐场），包围外面操场。食堂空间被视为边界，当托儿所不运营时，它可以用作入口空间以及社区空间。在东侧，厕所模块沿着房顶向下倾斜，并在主楼的走廊处结束。

主要建筑有三间教室，每间面积 35m²，办公空间和厕所。48 个混凝土基座支撑由木材部分和调色板制成的高架地板。按树杆作为支撑体系附着在地板的结构上。

这些树杆是用我们在附近森林里砍伐的树木做成的，树皮被剥皮、干燥、烧焦，最后涂上两层亚麻子油。这种技术灵感来源于日本的 shou sugiban 技术，可以长期保护木材而不需化学处理。事实上，在建筑领域中使用的大部分当地可用的组合物都是用杂酚油来处理的，这是通过蒸馏各种焦油形成的含碳化学物质，但却会致癌（仅在法国有限使用）。这个结构体系用作两个幕墙的支撑。南墙是由彼此组合的调色板组成，我们应用了由再生纸板和水泥（纸浆）组成的石膏。感谢一家本地公司，我们能够收集大量的二手纸板，这使得我们能够大大减少石膏的使用量。墙壁结构内铺设了一层二手织物绝缘层，以最大限度地提高教室的散热和声学舒适度。北立面是由当地公司慷慨捐赠的木制窗框组成。这些框架坐落在由纸板管和瓦楞纸板制成的坚固基座上。考虑到结构是由一部分在形状和尺寸上随机完全不同的树杆构成的，我们选择将该外观与结构分开，使其成为独立的元素。

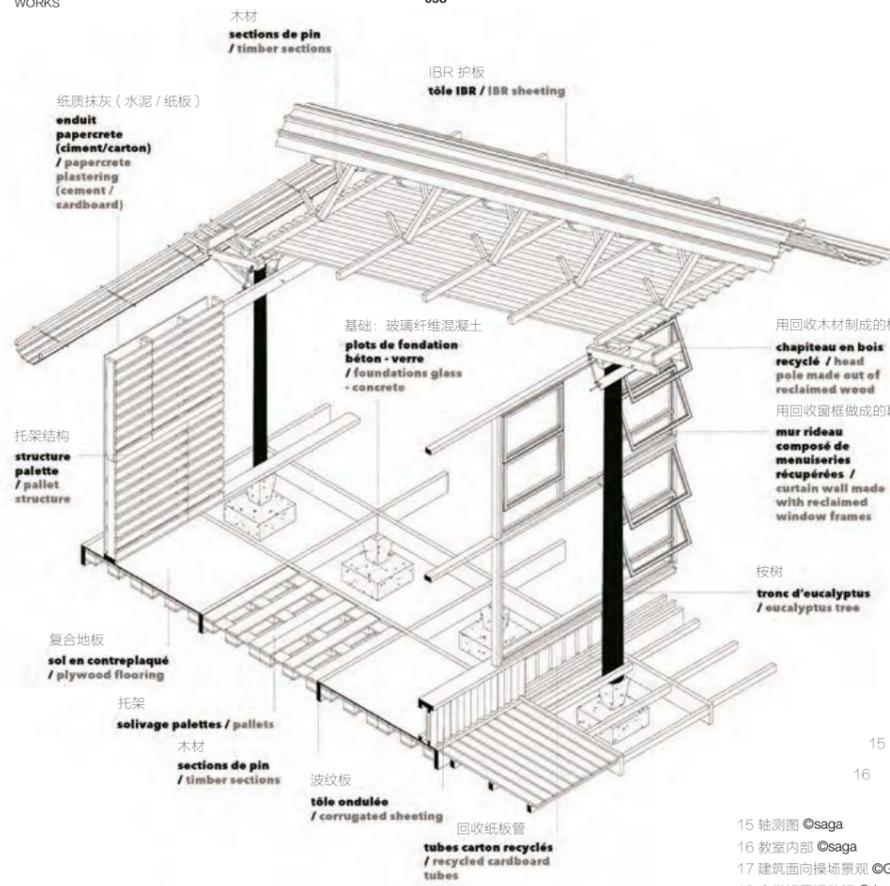




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7 当地民众绘制蓝图 ©saga
8 项目前期展览 ©saga
9 建造及施工过程 ©Yasmina-Gonzalez
10 剖面图 ©saga

11 安装屋顶 ©Yasmina-Gonzalez
12 南面外墙施工 ©Yasmina-Gonzalez
13、14 参与施工的社区居民 ©Yasmina-Gonzalez



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15 轴测图 ©saga
16 教室内部 ©saga
17 建筑面向操场景观 ©Gorka-Biurrún
18 食堂设置滑动门 ©Joubert-Loots



附属于主楼的结构，餐厅空间被视为多功能空间。它是用来给孩子享受午餐以及附近使用流动厨房的人。在周末期间，它可以独立于托儿所开放，用于婚礼、葬礼、派对、教堂活动等社区活动。食堂的结构由我们从当地公司收集的回收工业架构成。屋顶由四个9m跨度预应力梁组成的框架支撑。这些梁由钢板部分制成，预制件采用纸板和镀锌钢板组装，两者都来自当地公司的废料中。

建筑物内已有蓄水系统。它把收集的雨水储存在东侧的四个回收水箱中。这些蓄水池的水用于厕所，这就避免了使用市政用水进行冲洗。雨水也被收集在食堂的屋顶上，然后用来浇灌菜园。



Joe Slovo West is a fast developing area, constantly renewing itself: it is a permanent construction site; governmental houses being built to replace the existing self built shacks. Some of the residents have been waiting for more than ten years to obtain such a house, the same for every household; basic concrete block shell of 36 square meters. This massive construction programme called RDP is a nation-wide initiative launched in 1994, promoting free housing for the under privileged.

Overcoming the precarious life conditions, some local community members actively engage in various initiatives to improve their area. For nearly ten years,

Patricia Piyani, founder of a local preschool and soup kitchen, has been taking care daily of many children from 1 to 6 in her community. Patricia did not have the chance to go to school when young, which led her to dedicate her life to give the opportunity of a proper education to the children of her area. Her initiative slowly grew and the number of children in her preschool is increasing; the need for new facilities arises.

Since 2014, saga has been involved in a community project in Joe Slovo West, an informal area in the suburbs of Port Elizabeth, South Africa. The team has been working together with local residents on the implementation of various facilities within the precinct. After a first building in 2015 (community hall), the team went back to Joe Slovo to continue with the second phase of the process.

The first step is to interrogate what is there, already, what we can use and transform, with whom we can work and what we need to bring. We have to learn about the environment, make the time available to understand the broader context. All together, a project is born, made from local resources and people, an attempt to provide an appropriate shelter to this generous initiative. The design is negotiated collectively; the use of local refurbished and reclaimed materials is imposed: the process has to be incremental, every step of the design being based on experimentation. Materials and objects collected



from all over the city are assembled together, reused, distorted, to create a whole new story, based on a collective effort.

The preschool is a shelter for new experiences for the children, offering large views toward the surroundings, playing with shadows and light, showing the reality of its construction. Raw materials are assembled to form a warm learning environment, offering three large classrooms naturally ventilated, and widely open towards the broader landscape. The canteen space, enclosing the outside playground, offers to the children and community members a shared space, a canvas for new tales, games and other events. Sanitation is provided, using mainly rainwater, and a large office was built for Patricia and the four teachers. The building reflects the story of the preschool, it is singular in its dimensions and aspect, it is man-made; its construction contains a multitude of collective stories, so many beginnings for new opportunities.

Designing With Recycled Materials

At the same time, we started to collect materials for the future building. One of the goals of the project was indeed to show the great potential of recycled and reclaimed materials in the construction field. The idea is to use easily available waste materials (palettes, corrugated sheets, scrap metal, cardboard) and use them as the basis to design the preschool. We established various partnerships with local companies, which let us collect materials from their waste disposal (most of the time they pay companies to take out their trash which makes it easier for us to collect for free). Each and every element collected that way is studied in order to determine its potential to become a construction element.

The second phase is then to build scale one prototypes to test the different combinations of those materials as well as their strengths and durability. The main rule was to always opt for easily replicable techniques, the idea being that those can be reused by the community members in their own projects. In the meantime, this ensures that they can easily maintain the facility once the construction is finished.

An Open Construction Site

The construction of the preschool took four months and a half, between December 2016 and April 2017. It used very limited resources and was conducted by a team composed of volunteers, both from the international nonprofit organizations (saga & Uncedo) and from the community. The construction site was always open to the public, different people from different backgrounds joined for a few hours or days, according to their free time. As soon as the construction started, a new public life took place, the site becoming a singular point in the neighbourhood, generating interaction between

various people. Even though the construction site is a public space with a lot of flaws (noise, dust ...), it gathers many people coming from various parts of the city (and the world), rich or poor, young and old, etc., in one space. For a moment, they are connected, equal in their gestures that they have to achieve, and share a common goal: to build. The site becomes a place of interaction where new relationships are created; connections are made bringing new opportunities to the community and ourselves. After all, the construction process is an excuse for different people, whom would rarely meet in the "normal life", to share something, to connect and learn from each other.

New Facilities for the Siindokuhle Preschool in the Hope of A Better Future

The building of the new Siindokuhle Preschool is set on the top part of the vegetable garden, using the slope to overlook the existing constructions. It opens up to the larger landscape on the North side in order to both enjoy the views and maximize the solar gain in the classrooms. On the South side, the building is more introverted, protecting the kids from the nuisance of a busy road.

Two additional spaces (canteen and playground) complete the facility and enclose the outside playground. The canteen space is seen as a threshold, it can be used as an entrance space as well as a community space when the crèche doesn't operate. On the East side, the toilet block slides underneath the roof and ends the corridor of the main building.

The main structure consists in three classrooms of 35 square meters each, an office space, and a toilet block. 48 concrete foundation blocks support a raised floor made of timber sections and palettes. A set of eucalyptus poles is attached to the structure of the floor.

These poles are made out of trees we cut ourselves in a nearby forest, whose bark was peeled, dried, burnt and finally painted with two coats of linseed oil. This technique, inspired from the shou sugiban (Japanese technique), allows a long lasting protection for the timber poles without using chemical treatments. As a matter of fact, most of the locally available gumpoles used in the construction field are treated with Creosote, a carbonaceous chemicals formed by the distillation of various tars, which is, inter alia, carcinogenic (the use of this treatment is highly limited in France). This frame of poles is used as a support for the two curtain walls closing the building. The South wall is made of palettes assembled one with each other on top of which we applied a plaster composed of recycled cardboard and cement (papercrete). Thanks to a local company, we were able to collect a large amount of second hand cardboard, which enabled us to reduce drastically the use of sand for the plaster. A layer of second



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19 师生合影 ©Joubert-Loots
20 在课堂上上课的小朋友 ©Joubert-Loots

hand textile insulation was laid inside the structure of the wall, to maximize the thermal and acoustic comfort in the classrooms. The North façade is made out of a composition of wooden window frames that were generously donated by a local company. Those frames sit on a strong base made of cardboard tubes and corrugated sheeting. Considering that the structure is made of part of trees that are completely different random in terms of shape and dimensions, we chose to detach this façade from the structure, to make it an independent element.

The roof design was a great challenge for the team: how do we design an efficient insulated roof system with a low budget and nearly no timber sections?

The idea is to combine the use of two roof sheets layers: the top one being curved to bring rigidity, the second one being used for waterproofing and ceiling. In between those two sheets, the wooden section acts as spacers to maintain the top layer curved. Each part of the roof was fabricated on the ground and measures 7,20m by 2,50m. There were lifted on top of the poles using manpower only. To connect the poles and the roofing elements, a head pole was designed and built in recycled wood. The void inbetween the two layers of roof sheeting allows the air to flow and cool down the top layer in summer, to avoid overheating inside the classrooms.

Attached to the structure of the main building, the canteen space is seen as a versatile space. It is used to host the kids for lunchtime as well as the people using the nearby soup kitchen. During the weekend, it can be opened independently of the crèche and used for community events such as weddings, funerals, parties, church events etc. The structure of the canteen is made out of reclaimed industrial racks that we collected from a local company. The roof is supported by a framework consisting in four 9 meters' span pre-stressed beams. Those beams are made of a steel section which is pre stressed with an assembly of cardboard tubes and galvanized steel plates, both collected in the waste of local companies.

A water collection system is in place in the building. It collects the rainwater that is stocked in four reclaimed water tanks on the East side of the facility. These tanks supply the toilets in water and allow us to avoid using Municipal water for the flushing. The rainwater is also collected on the canteen roof and then used to water the vegetable garden.

