Steven Holl Architects
Library for MAF

THE MIRACLE FOR AFRICA FOUNDATION

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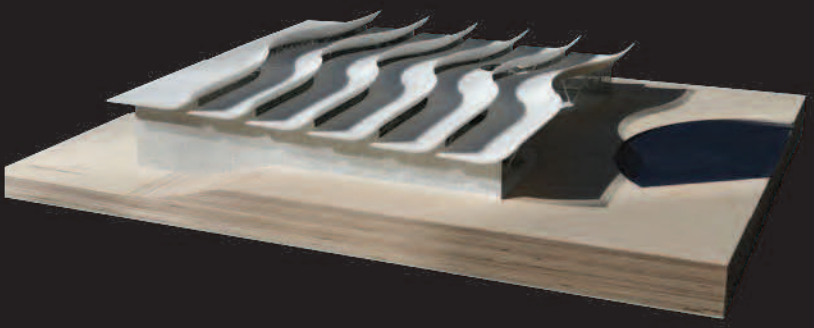
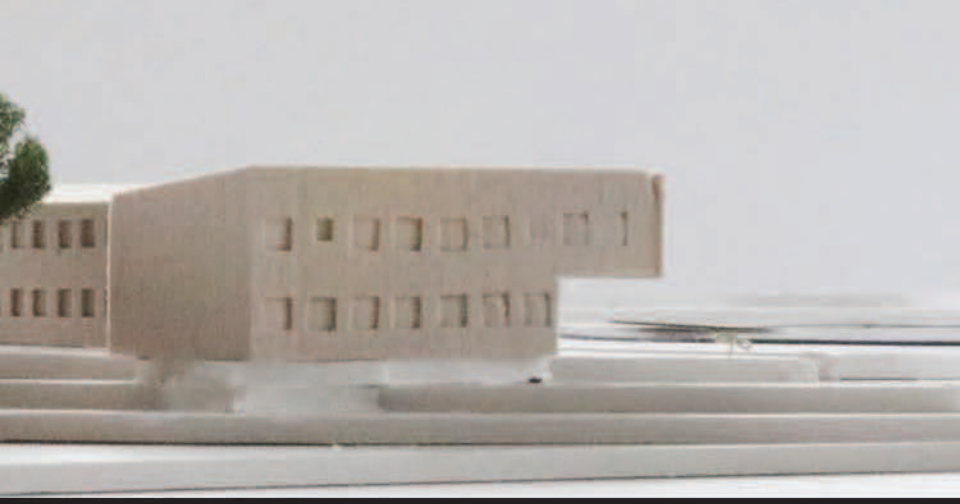
http://www.stevenholl.com/projects/malawi-library
http://www.stevenholl.com/projects/malawi-masterplan
http://www.miracleforafrica.org/our-work/education

For more information on the Malawi Library, please contact jongseo@stevenholl.com.

In the hills on the edge of Lilongwe, Malawi, 170 hectares of land are dedicated to a new campus for the Miracle for Africa Foundation, an initiative to expand healthcare, education, and agricultural education. The campus masterplan, inspired by Batik paintings of a local Malawian artist, creates a condensed pedestrian campus positioned strategically in relation to its existing buildings.

The first building for the new campus is a central library providing





6,600 square meters of space for books, archives, reading rooms, classrooms, offices and an open forum. The architectural aim: to bring in the maximum of cool natural light while powering the building via solar energy. An ascending array of roof elements each have a gentle curve, like the wind moving across a field, giving orientation to the interior spaces. The flexible solar panels along the roof create an ecological engine, supplying energy to the library itself and other campus buildings. A locally crafted bamboo screen enclosure allows the entire library to breathe with natural ventilation and net-zero energy consumption, while a few free floating glass rooms control humidity.

Building as an Ecological Engine for the Campus and Malawi

The curved roof is covered with flexible solar PV sheets, a pioneering solution to Malawi's crippling energy crisis. The roof produces 627 MWh/a of electricity, 340% more than its calculated consumption of 142 MWh/a. All excess energy is distributed to the rest of the campus.

Thermal capillary mats behind the PV panels harvest solar energy for free water-based heating at night, while boosting the efficiency of the PV panels themselves. The ratio of the façade's perforation was calculated to utilize the dominant East South East winds and maximize cross ventilation throughout all reading and office spaces. Roof-formed mezzanine clerestories allow diffused daylight from the South, ensuring reading and office spaces with the maximal duration and quality of natural light.

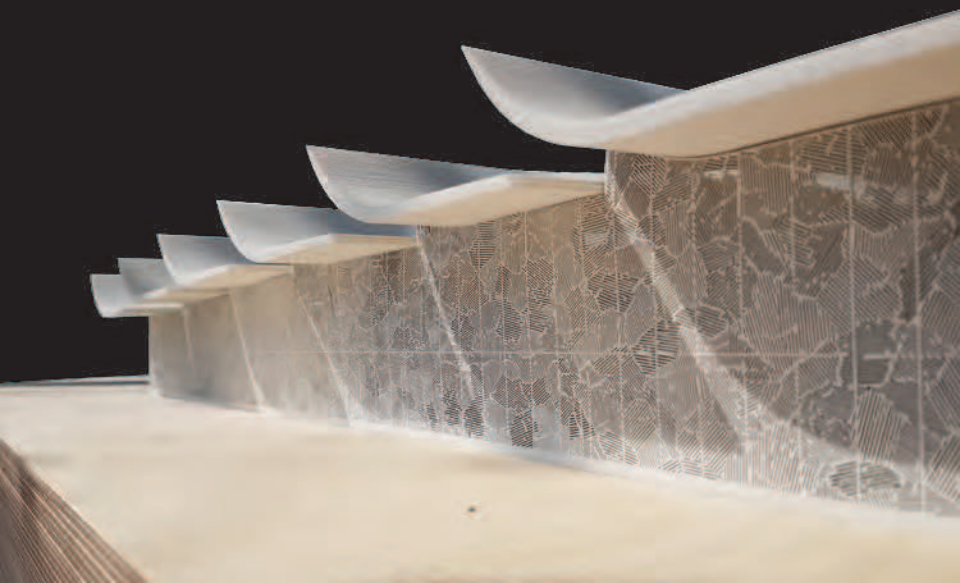
The two main construction materials, local wood & bamboo, are used to create a permeable façade, while ductal or UHCP concrete is used for the roof / columnar structure. The UHCP results in a very low carbon footprint while providing tremendous material savings in iron and aggregates, up to 70%. The roof is designed to be thin enough to reduce material consumption and waste, while sufficiently thick enough to provide a regulating thermal mass. Waterless toilets and greywater management strategies

in combination with rain water harvesting and storage ensure no drop of water goes to waste, but is instead utilized for landscape irrigation.

A permeable dust filtering façade for the building allows natural cross ventilation through the building during the day and an exposed thermal mass to naturally cool off at night. During the dominant rainy season peak temperatures are above 35C while nights are below 22C.

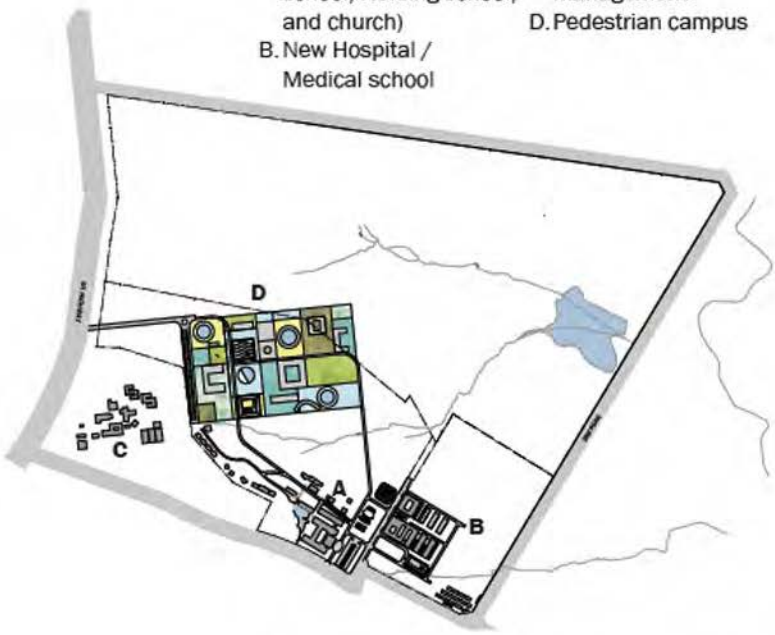
Awards

2017 LaFargeHolcim Awards, Middle East & Africa Prize Winner
2018 Progressive Architecture Awards, Citation



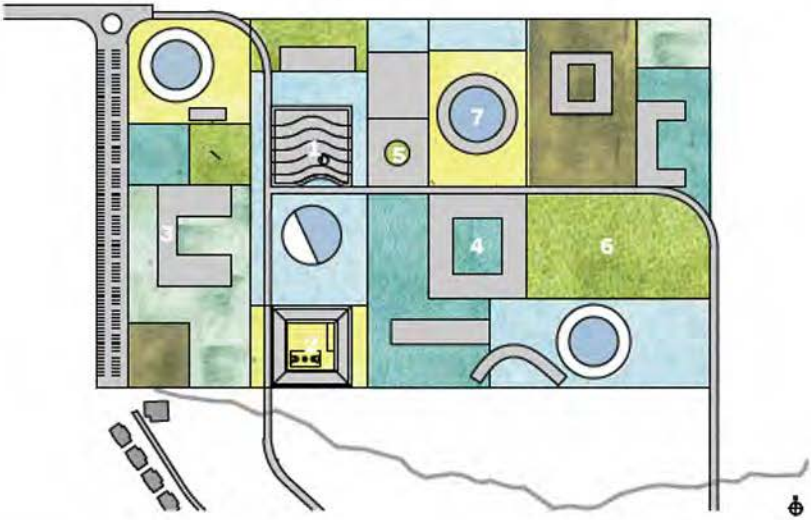
Site Plan

A. Existing campus (IT school, Nursing school, and church)
B. New Hospital / Medical school
C. Malawi Institute of Management
D. Pedestrian campus



Pedestrian Campus Plan

1. Library
2. Dormitory & Gym
3. Science & Technology Building
4. Art Building
5. Student Union & Cafe
6. Athletic Field
7. Ecology & Agriculture Building



Miracle for Africa Foundation Site

- Lilongwe International Airport to Miracle for Africa Foundation: 8 miles
- Miracle for Africa Foundation to Malawian Parliament House: 6.8 miles