

Mount Sinai Ambulatory Surgical Facility

Kyabirwa, Uganda



SQ FT
8,500 BGSF



OWNER/AFFILIATION
Kyabirwa, Uganda



ARCHITECT(S)
Kliment Halsband
Architects



COMPLETION DATE
2019



EXTERIOR VIEW



NORTH

SITE MAP

ABOUT | DESIGN INTENTIONS

This independent, **off-the-grid ambulatory surgical facility** is a replicable prototype for the five billion people in the world who lack access to safe or affordable surgery. The buildings is composed of three functional elements: a reception pavilion with offices grouped around a family waiting area courtyard, an intermediate pavilion for pre-op and post-op activities, and a sterile pavilion with two operating rooms and related support spaces. **These elements are sheltered under a solar panel shade structure.**



AERIAL VIEW



WAITING SPACE

Mount Sinai Ambulatory Surgical Facility

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THREE OPEN ENVELOPE PAVILIONS

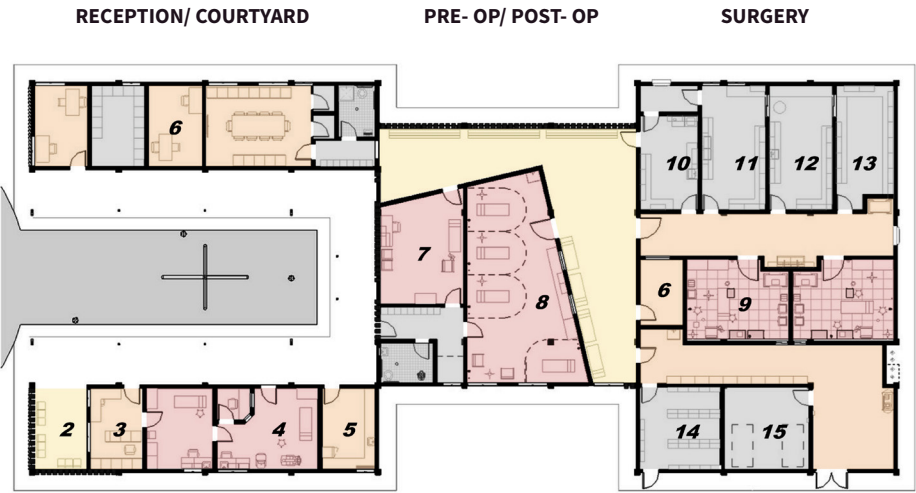
- Reception & Courtyard Waiting
- Pre-op & Post-op activities
- 2 Surgery Operating Rooms

This project provides ambulatory surgical procedures for a population that has no access to such care today. Careful analysis of required systems and equipment resulted in the elimination of many redundant complex and costly systems typically found in high tech urban hospitals. This research, and simplified construction, relying on local materials, made it possible to deliver cost-effective health care in underserved areas.

KEY

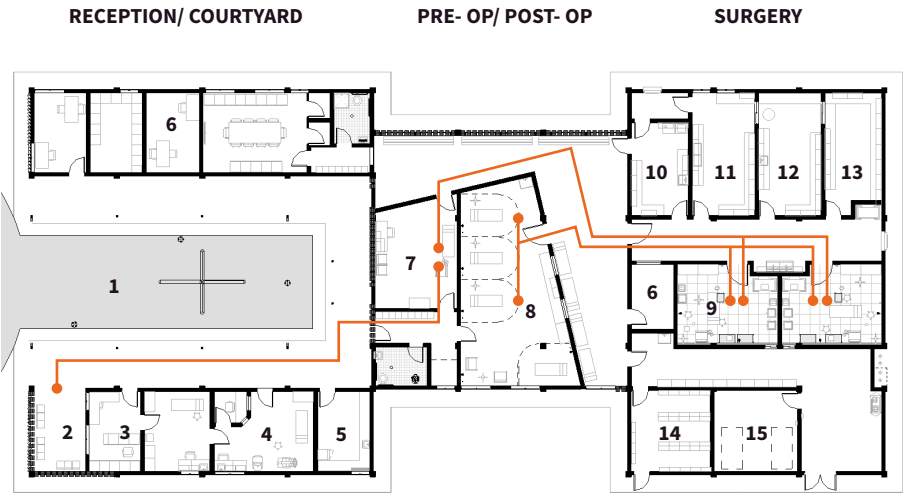
- Patient Care
- Registration/Waiting
- Staff
- Building Support

GROUND LEVEL:



- | | |
|-------------------|----------------------------|
| 1 Courtyard | 9 Operating Room |
| 2 Waiting | 10 Wash/Linen |
| 3 Registration | 11 Surgical Soiled Room |
| 4 X-Ray/Exam Room | 12 Surgical Clean Room |
| 5 Lab | 13 Sterile Supply |
| 6 Office | 14 Medical Supplies |
| 7 Pre-Op | 15 Electrical Battery Room |
| 8 Recovery Room | |

TRAVEL DISTANCE ANALYSIS



- | | |
|-------------------|----------------------------|
| 1 Courtyard | 9 Operating Room |
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THREE OPEN ENVELOPE PAVILIONS

- Reception & Courtyard Waiting
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The aesthetic goals of the project were to relate to the surrounding architecture while adding contemporary unique visual elements. Red clay cladding tiles with wavy shapes reminiscent of the nearby White Nile were formed in custom, handmade molds. In combination with the shade-providing solar roof, the brick structure tells the story of modern and vernacular technologies working together to improve lives.

KEY SPACES:

- ▶ X-Ray/ Exam Room (627 nsf)
- ▶ Recovery Room (678 nsf)
- ▶ Pre-op Room (950 nsf)
- ▶ Office (340 nsf)
- ▶ Operating Rooms (750 nsf)
- ▶ Wash/ Linen (411 nsf)
- ▶ Surgical Soiled Room (608 nsf)
- ▶ Surgical Clean Room (608 nsf)

DEPARTMENTAL GROSS SQUARE FOOT

| TAKE-OFFS | Net | Gross | N/G ratio |
|----------------------|---------|---------|-----------|
| Patient Care | 2750 SF | 3500SF | 1.27 |
| Registration/Waiting | 400 SF | 500 SF | 1.25 |
| Staff Work Area | 3180 SF | 4120 SF | 1.30 |

TRAVEL DISTANCE ANALYSIS

- Patient Waiting/Registration to Pre-Op 143ft
- Patient Pre-op to Operating Room(s) 135ft- 159ft
- Patient Operating Room(s) to Recovery 81ft - 134ft

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DESIGN GOALS

The building is designed with a focus on the simplicity of construction. Materials and systems are **minimally invasive**, based on available materials and labor. **Simple modular building forms** made it possible to use local labor to construct the building. All materials and technical system components are available locally and can be maintained in place. **Regionally sourced bricks are composed in complex patterns of varying densities, forming screens that let in light and air to solid walls.** The bricks and cladding tiles used in the facility were made from red clay dug directly out of the ground near the building site and fired in a local kiln. **Brick was utilized in this project because of its availability, its historical presence in the area, and the potential to support the local economy through its use.**



"TREE-LIKE" ROOF SUPPORT

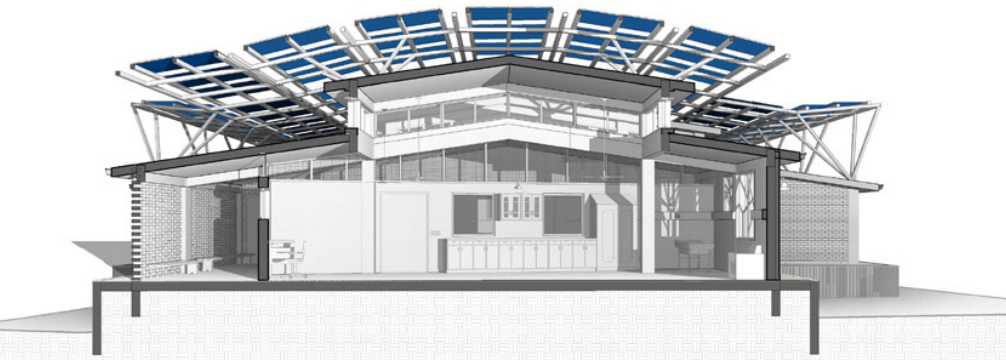


COURTYARD

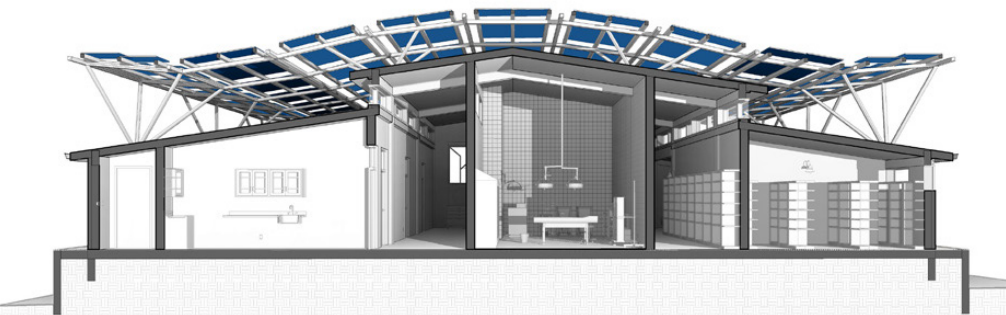


SOLAR COLLECTOR ROOF

SECTIONS



SECTION - THROUGH RECOVERY



SECTION - THROUGH OPERATING ROOM

SECTION

The site didn't have potable water, reliable electricity, internet, or the necessary sanitary facilities available so the firm had its work cut out. **It built a canopy made up of solar panels that also offers shade.** Uninterrupted power is provided using a combination of the solar panels, as well as battery storage, an onsite generator, and the intermittent power available from the grid.

A reliable internet connection is essential as it's used for the local doctors to consult with Mount Sinai Surgery in New York, USA, using a real-time operating room video link. **Therefore, some 20 miles (32 km) of underground cables had to be installed too.**

Well water and whatever safe water can be sourced from the nearest town is stored in gravity tanks and filtered and sterilized as required. **Rainwater is collected and used for both toilet flushing and an onsite vegetable garden used to feed patients and staff.** Liquid sanitary waste is handled by an onsite septic tank system and medical waste is incinerated onsite. The interior of the building is cooled passively with the breeze (except for the actual operating rooms which require air-conditioning).

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DESIGN GOALS

INSPIRATION

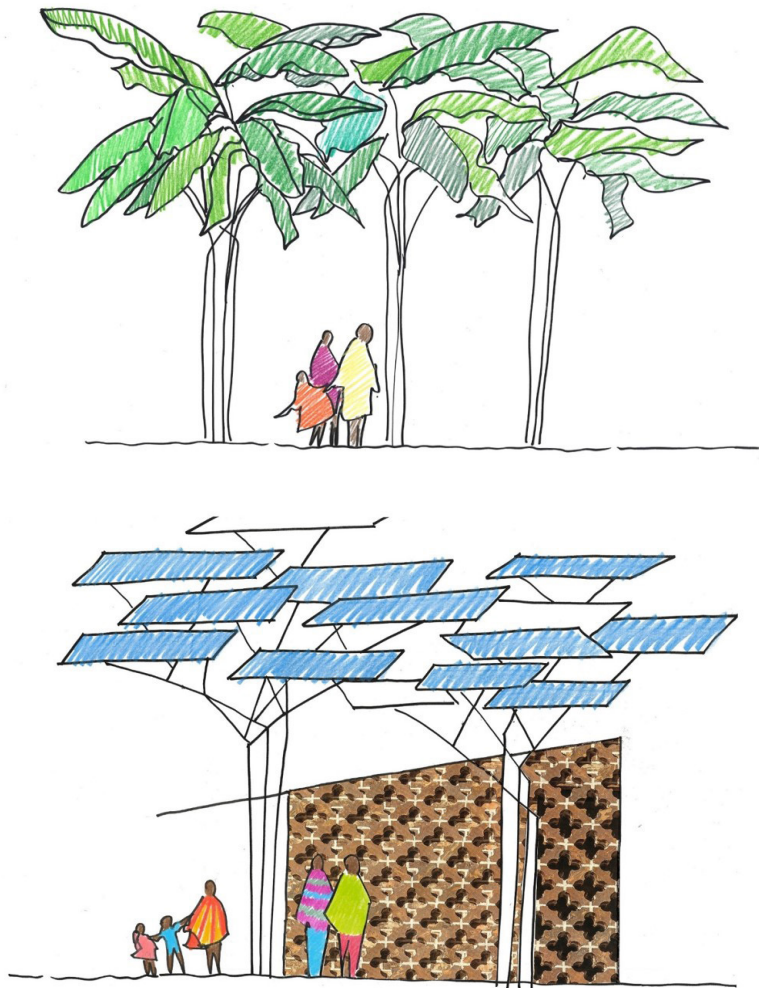
The stand of banana plants.

The banana plants on the site were the inspiration for the form of the building. The plants gather sun and **provide shade for the ground below** as the natural function of the solar panels: we thought of **solar panels as leaves of banana plants gathering sun and providing shade**. The solar array shelters and powers the simple modular brick facility beneath.

SOLAR ENERGY DRIVEN

PROJECT SUMMARY:

Project: Mount Sinai Ambulatory Surgical Facility
Project location: Kyabirwa, Uganda
Owner/Client: Kyabirwa, Uganda
Architect: Kliment Halsband Architects
Building area GSF: <10,000 sq. feet
Construction start date: 2017
Substantial completion date: 2018



AIA/AAH DESIGN AWARD WINNER

Category: Innovations in Planning and Design Research, Built and Unbuilt

JURY COMMENT

- ▶ This project is an understated and beautiful response to the difficult functional program of translational medicine.
- ▶ The needs of academic research, clinical medicine and community on an iconic campus were thoughtfully combined with this design.
- ▶ The clean form and refined details enable this facility to stand comfortably alongside prominent neighbors. In a context sensitive urban setting, this facility creates a bench to bed (or clinic exam room) facility that will accommodate a wide variety of research efforts tha is still welcoming to the patients.
- ▶ Material selection exterior and interior are sophisticated and technical while imparting a comfort and warmth.
- ▶ This is an exemplary solution of how design can foster interdisciplinary collaboration between departments and research teams.



EXPLODED AXON - layers of construction

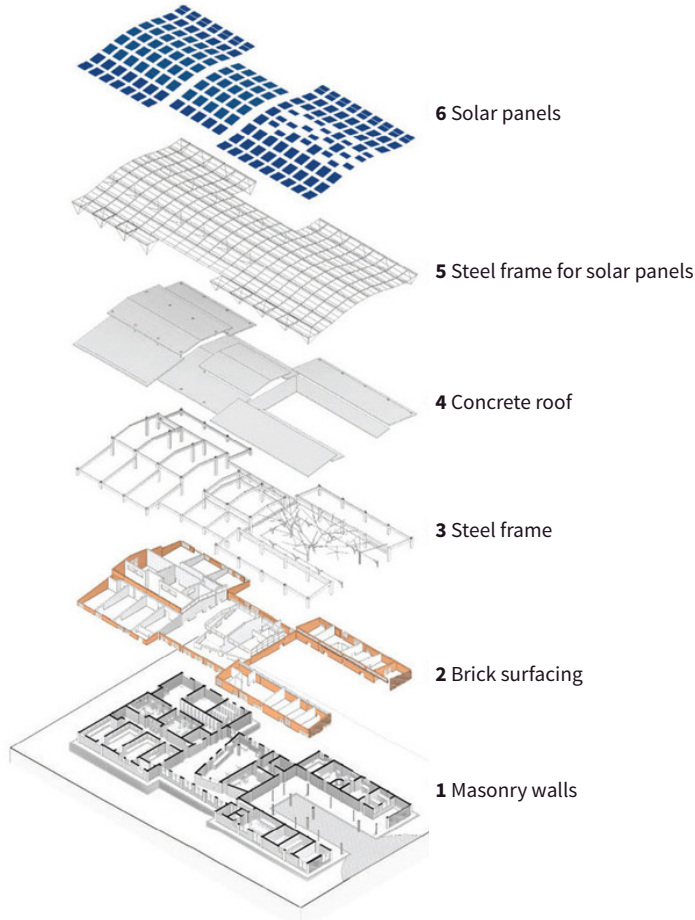


Image Sources: <https://www.archdaily.com/928402/mount-sinai-kyabirwa-surgical-facility-kliment-halsband-architects>