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Case Study Investigations and Design-Build Proposal near Gisenyi, Rwanda

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Abstract

This research evaluates architectural responses to peacebuilding and modernization in Rwanda since the 1994 genocide. It proposes a collection of case studies and analyzes the effectiveness of architectural methods that respond to specific programs while maintaining a sensitivity to the political and cultural climate. It identifies the conceptual and practical logic behind design through the selection of local material, empowering unskilled workers, responding to the context, and establishing a positive relationship with members of the community. As an additional frame of reference, this research analyzes the design-build pedagogy at the University of Florida School of Architecture to understand practical implication in Rwanda. These projects collectively serve as a reference for proposing a small-scale design-build initiative with local Rwandan members of a pottery and dance cooperative near Gisenyi, Rwanda, where the University of Florida Arts in Medicine Program has identified a need for improving and building upon the existing facilities.

Keywords: design-build, Rwanda

Introduction

Following the Rwandan genocide in 1994, Kigali has experienced rapid economic growth and urbanization in the interest of the national government and foreign business investors. The government sought to establish peacebuilding by constructing villages, implementing a roof modernization program, and increasing overall government control. They also facilitated the Kigali Urban Master Plan which prioritizes the appearance of progress and modernization above other critical needs.[1] This strategy can be defined as "liberal peace" orthodoxy, where democratic institutions and the liberal market economy are encouraged to produce stability and peace. Critics of this view remark that this system privileges foreign political and economic endeavors instead of focusing efforts at the local scale to address the causes of conflict for marginalized individuals.[2] At times, this "peacebuilding" can exacerbate existing tensions if not

[1] Mearma Sharma. "Remaking Kigali: A 21st century Rwanda built by Rwandans." Matador Network. Last modified May 9, 2012. Accessed March 31, 2018.

[2] Delia Wendel. "Spatializing Social Research: Locating Peace after Mass Violence." The Social Science Research Council. Last modified Nov 15, 2016. Accessed March 29, 2018.

sensitively implemented. Delia Wendel, who received her PhD in Urban Planning, provides an interdisciplinary approach to her research, analyzing how communities rebuild post-conflict, particularly in Rwanda. She identifies effective success criteria for peacebuilding, including "planning for complexity, designing for the margins, learning from local views, and addressing the structural and underlying causes of conflict."[3] This perspective serves as the basis for evaluating the following case studies, which unlike recent government modernization projects, demonstrates a broader cultural sensitivity and design ethic.

Methodology

The following collection of case studies and experiences inform the proposed approach to the design-build initiative in Gisenyi, Rwanda. Three case studies from Rwanda and one local project were selected based on criteria including: consideration of the existing context, a successful response to people's physical and cultural needs, the use of local and sustainable materials and the empowerment of the community. These projects serve as a guide for evaluating and interpreting how to meet the needs of the Rugerero Pottery Studio in Rwanda.

Case study investigations

Case Study 1: Women's Opportunity Center, Kayonza, Rwanda, 2013

Sharon Davis Design, a New York based firm, partnered with humanitarian organization Women for Women International, to build a community center that provides women with opportunities in education, commerce and cooperation. This training center provides women with skills enabling them to generate income for themselves by participating in the subsistence agriculture economy.[4] This project is particularly successful in the way its formal expression responds to the context and how the building elements are made using empowering and sustainable practice methods.

The Women's Opportunity center is a series of seventeen small pavilions centered around a public plaza where participants gather to sell goods and food. The organizational strategy is derived from a traditional Rwandan village. The round pavilions, made of clay brick with sloping

[3] Ibid.

[4] Sharon Davis Design. "Women's Opportunity Center/ Sharon Davis Design." ArchDaily. Last modified October 3, 2013. Accessed March 31, 2018.

roofs, are modeled after the vernacular architecture of the King's Palace in southern Rwanda, which uses passive cooling and solar shading[5]. Because women generally gather in groups of twenty to twenty-five during instruction, this circular form focuses inward in a gesture that is conducive to learning and community-building. The bricks used were made by the women from the center through a labor-intensive manual press method adapted from local building techniques.[6] Not only did this enable the women to contribute to its construction, but it strengthened identity and provided them with marketable skills and the ability to capitalize upon these sustainable building practices for future projects.

Case Study 2: Kimisigara Community Center, Kigali, Rwanda, 2012

This community center was a collaborative project between Esperance, a local Rwandan football team, and Architecture for Humanity. These organizations worked together to design a space that seeks to dissolve lingering ethnic tensions from the 1994 genocide by educating youth and providing a community gathering place.[7] This project demonstrates a critical understanding of the needs of Kimisigara, the largest informal settlement in Kigali. Here, people live in extreme poverty, and suffer from unemployment, inadequate sanitation, and overcrowding.[8] Roofs define meager dwelling spaces, and the spaces between are used for shared activities such as cooking and washing clothes. In this underserved area, the community center is a monument to the people's identity, a vital component to re-establish in communities suffering from conflict.[9] The center is also sensitive to its context, responding to the geography and social infrastructure of the region. It engages the pedestrian walkway along a canal where the people publicly gather to participate in various activities including the buying and selling of goods, bathing and conversing.

The Kimisagara Community Center seeks to create a zone that further encourages these "social interactions and informal economies."[10] A large roof over a flexible community space creates a new public area adjacent to the football field where people can gather, play and

[5] Ibid.

[6] *Sharon Davis Design- Women's Opportunity Center Rwanda* directed by Fredric King (2014; SharonDavisDesign), Video.

[7] Killain Doherty, "Territories of Practice Kimisagara Community Center, Rwanda." Mas Context. Published 2013. Accessed March 31, 2018.

[8] Ibid.

[9] Ibid.

[10] Ibid.

organize events. To provide for this greater need, Architecture for Humanity minimized spending on materials and finishes, opting for locally fired clay and papyrus weave instead of sourcing materials from elsewhere.[11] This decreased cost and enabled the center to invest in the local economy while going beyond the initial program of a football center to meet the visible needs of the larger community.

Case Study 3: Masoro Village Project, Masoro, Rwanda, 2013

The Masoro Village Project, implemented by General Architecture (GA) Collaborative, reflects a strong teaching methodology in the construction of a housing prototype. The successful characteristics of this project include the innovative use of inexpensive material, the ability to effectively communicate architectural ideas with members of the community, and the use of construction methods to empower non-experienced workers. The home was made with a simple EarthBag construction technique utilizing polypropylene, a product of petrochemical waste. Not only is this material sustainable, waterproof, fire resistant and bullet-proof, but it is long-lasting and has efficient thermal and acoustic qualities.[12] A company based in South Africa, Eternally Solar, provided workshops for student interns from the University of Rwanda and for the residents of the Masoro village to learn to assemble the EarthBags, or building blocks.

This process, although labor-intensive, trained students and members of the community in skilled labor and managing positions. For lighter components of the construction, such as screens for the kitchen and bath, the women applied their skills in weaving sisal, reeds, banana leaves, and papyrus.[13] Communication between the designers and residents was crucial to meeting the needs of a dwelling in Masoro. In addition to the language barrier, there was the challenge of translating architectural ideas between the professionals and clients, who had difficulty reading plan, section, and axonometric drawings. The students from the University of Rwanda assisted in bridging this gap by communicating in Kinyarwanda and encouraging the village workers to use creative methods to express their design ideas. In one instance, a woman used a stack of paper to map different room locations on the ground. A few individuals also communicated using elevation drawings.[14] Often times, this translational gap can be overlooked, creating a discord

[11] Ibid.

[12] Yutaka Sho, Syracuse University. "Home Experiments: EarthBag Construction as Teaching Tool in Rwanda." 121st ASEE Annual Conference & Exposition, June 15-18, 2014.

[13] Yutaka Sho, Syracuse University. "Home Experiments: EarthBag Construction as Teaching Tool in Rwanda."

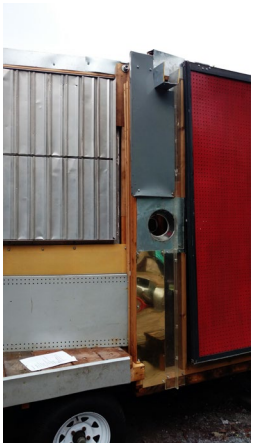
[14] Ibid.

between the ideas of the architect and the needs of the client. By building with low-cost materials and fostering a relationship with the client, GA Collaborative created a more sustainable, holistic and long-term solution that met both the physical and cultural needs of the inhabitants.

Case Study 4: "Maker-space at The Repurpose Project," Gainesville, Florida, 2018

This local case-study draws upon personal experience working as part of a design-build team at the University of Florida. Fourteen undergraduate architecture students spent their last semester working to construct a mobile maker-space at the Repurpose Project, a non-profit organization that diverts useful resources to be re-used or upcycled instead of going into landfills. This maker-space is a 7 ft. x 16 ft. mobile construction intended to travel locally as the Repurpose Project participates in various events.

Like the Rwandan case studies presented, this project focuses on using sustainable low-cost materials, enabling unskilled workers, and maintaining a close conversation with the client throughout the construction process. Materials used in this construction were repurposed from the site and include tongue-and-groove wood roofing, 2 x 4 and 2 x 6 cedar wood, and other found objects at the site. Because most students have little building experience, this project provides an opportunity for them to learn valuable skills that will inform future work while meeting the needs of the client.



Figures 1 and 2. Found building materials led to innovative cladding solutions. © Ana McIntosh

Simply experimenting at the site with the available materials often inspired improved design ideas and creative problem-solving (Figures 1 and 2). The continuous conversations with Repurpose Project employees was crucial to helping understand their needs and driving the design decisions. Discussions with designers who have experience in similar projects were

helpful as well. One week, the University of Florida architecture students had the opportunity to collaborate and learn from DK Osseso-Asare, founding co-principal of LowDo, an innovative design-build firm that implements low-cost, low-energy solutions. His experience working on a maker-space in Accra, Ghana, the Agbogbloshie Makerspace Platform, provided unique insights that helped guide the project. Conversations with DK informed how the students tested materials, considered program flexibility and security, and made design decisions. The team was constantly adjusting and rethinking in reaction to new observations and restrictions. Because the designers were the ones building, responsive changes were easier as the distinction between thinking and making was blurred.

Evaluation and design-build proposal

In recent years, the University of Florida Arts in Medicine Program (UF AIM) has established a relationship with genocide survivors living in the Rugerero village. These people belong to the Twa community and have historically suffered from discrimination, poverty, and lack of access to proper education and healthcare. Since 2008, UF AIM has taken students and professional artists to collaborate with the development of pottery and dance cooperatives in the region.[15]

Figure 3 and Figure 4. Common dance space between existing buildings at the Rugerero Pottery Studio. © Jill Sonke

At the Rugerero Pottery Studio, a need was identified by director Jill Sonke to provide kiln ventilation, pottery storage, drainage, and ground surface stabilization, particularly for the areas

[15] "Community Engagement – Rwanda." University of Florida Center for Arts and Medicine. Accessed March 31, 2018.

between the buildings where people dance and play music (Figures 3 and 4). This proposal seeks to identify a method of approaching the project, informed by the four case studies mentioned. There is a strong possibility that this project could become a teaching instrument for members of the academic and professional community as well as for the Twa living in Rugerero. Utilizing a design-build approach will facilitate learning and collaboration among these groups. The designers and volunteers will learn from each other by sharing building techniques, experimenting with materials, and working to understand cultural differences. Individuals will gain valuable knowledge through this construction and collaboration process that will empower them to augment their marketable skills set, even without previous building or design experience. This is particularly important for empowering members of the community to undertake additional projects and to share and spread knowledge locally.

This proposal introduces the addition of interior millwork to provide storage spaces, a ventilation system for the kilns and an exterior ground and roof condition in the space between existing buildings. The spatial organization of the courtyard within its context is demonstrated in a plan view in Figure 5. Figure 6 shows the proposed architectural elements in that space which will keep people dry and safe as they dance, especially during Rwanda's rainy seasons, from March to April, and October to November.

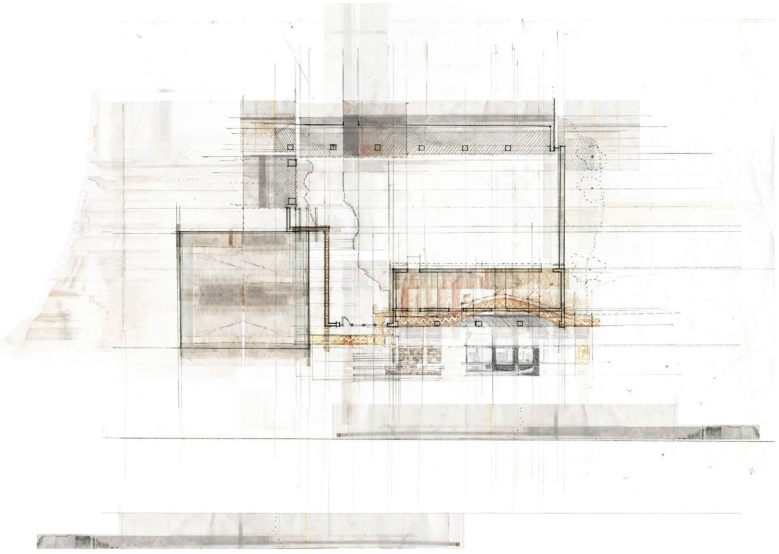


Figure 5. Aerial view of courtyard space with adjacent buildings and edge conditions marked. © Ana McIntosh

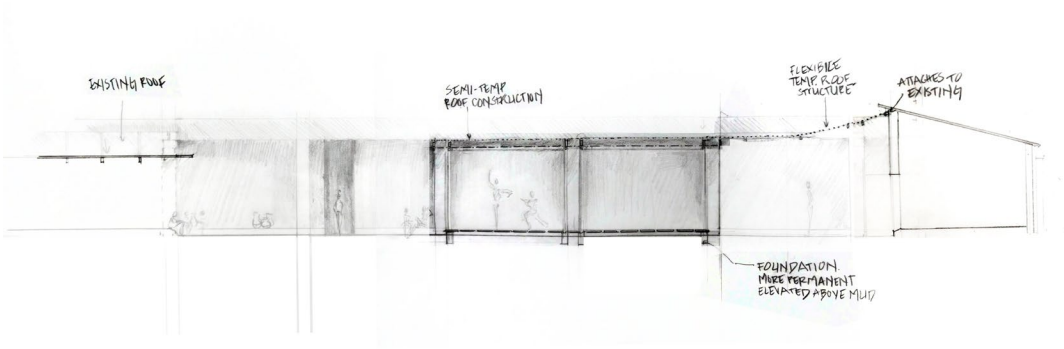


Figure 6. Cross section through exterior courtyard space proposed a raised ground and roof condition. This allows for a protected dancing space. May be temporarily used during the rainy season. © Ana McIntosh

Because Rwanda is in a highland tropical climate, with comfortable average temperatures at 68.9 °F (20.5 °C) throughout most the year, the proposed structure is open air and relatively simple. The available building materials may include woven structures, manually pressed bricks, ceramic tiles and/or other available materials inspired from the site and surrounding contexts. These details are to be further defined with a visit to the Rugereo Pottery Studio to determine site orientation, existing building conditions and to engage the community in extended communication to further identify the project's scope.

Conclusion

As a collection of case study investigations, this research determines important factors international workers and organizations should consider when working in a post-conflict region like Gisenyi, Rwanda. Successful projects identified include those that have closely observed the context of the place they are working by determining the physical characteristics, political climate, and demographics of the area to inform their design. The architects and builders attempt to understand the cultural norms of the community in which they are working and utilize sustainable and local materials to equip individuals with relevant knowledge and skills. Going one step further, this paper identifies the merits of a design-build strategy as a critical method of approach. This will enable designers to investigate and build with more freedom and engender an acute sensitivity to the context, site, and needs of the client.

The proposed design at the Rugerero Pottery Studio identifies initial considerations for providing ventilation, storage and a flexible outdoor dance space. This proposal was unable to further develop without visiting the site and speaking with members of the community to determine their exact needs, the available resources, and specific information about the site dimensions and orientation.

Future directions

The collaboration with UF AIM, the UF School of Architecture and the Rugerero Pottery Studio has only begun. A continued partnership will lead to opportunities to continue research determining how international organizations effectively, sustainably, and ethically work to meet the needs of diverse communities. A visit to the aforementioned case study projects and a site visit to the pottery studio is necessary to more specifically determine how to proceed.

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