New Americans' Pavilion: A Community Farming Hub for Refugees in Syracuse, NY

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Salt City Harvest Farm (SCHF) has provided farmland and job-training programs for new American refugees in Syracuse for more than five years, but has lacked built infrastructure to support its mission. The New Americans' Pavilion under construction at SCHF will provide facilities for refugee farmers to wash and pack the produce they grow on the community farm, as well as net-zero-energy refrigeration where produce can be kept fresh before it is consumed or brought to market. Furthermore, the pavilion will include flexible community spaces which will be used for teaching, learning, socializing, and dining.

This paper describes the collaborative, community-driven design and construction process used in the project. The pavilion was designed and constructed by a combination of community volunteers, professional contractors, and paid student Research Interns. As such, the process and built project serve as a model for how architects can collaborate with community organizations to serve their localities while also educating students of architecture.

The paper also details the specifics of the design as it relates to its unique site, program, and mission. The pavilion's cold-storage employs innovative low-cost technology whose energy consumption is offset by roof-mounted photovoltaics in order to achieve net-zero energy. The design of the pavilion also reflects the specific accessibility needs of the refugees that participate in the farm programs, many of whom are deaf or have serious hearing loss.

Finally, the paper describes how the success of the New Americans' Pavilion will be assessed using a variety of quantitative and qualitative metrics. The paper and the project it describes are intended to assert the agency of architecture to intervene in the multifarious global exigencies of the present day by modeling practices at a local scale, with small interventions that have potentially large impacts for sustainability, food security, social justice, and accessibility.

INTRODUCTION

In the past decade, Syracuse, NY has welcomed more than 7,000 refugees from diverse origins ranging from Eritrea to Nepal to Cambodia.[1] While Syracuse has suffered post-industrial economic decline and population loss since the 1950s, the influx of new Americans has helped to stabilize its population while enriching the culture of the city. However, many new Americans arrive in Syracuse in unfortunate circumstances, with limited social networks and job opportunities, and live in areas of the city with limited access to fresh food. The non-profit community farming initiative Salt City Harvest Farm (SCHF) was founded to assist the refugee community in response to these challenges. Since 2014, SCHF has provided farmland for refugees to grow their own food, as well as a variety of training programs to help the community learn to farm and bring their produce to market. The farm acts as an important social hub for new Americans in the Syracuse area to exchange knowledge, culture, and nourishment.[2]

However, as participation in Salt City Harvest Farm's programs grew, it became clear that the facilities for washing, packing, and storing produce on the farm were inadequate. Produce was processed out in the open with no cover from the sun, and the farm lacked refrigeration to keep produce fresh. These limitations inhibited participation in the farm programs and made it more difficult for farmers to store their produce before selling it at local farmer's markets. SCHF consequently applied for and was awarded a grant from the Chobani® Community Impact Fund to construct a new washing and packing shed including cold-storage.

The author of this paper was invited to design the proposed building on a pro-bono basis together with his Syracuse-based architectural practice ASDF. The author furthermore secured research funding through Syracuse University to support a design-build endeavor together with a team of paid student Research Interns and community volunteers to design, construct, and assess the pavilion building. The proposed building was named the New Americans' Pavilion in order to give the refugee community a sense of ownership over the space and to emphasize SCHF's mission to empower refugees in the Syracuse area.

Figure 1. View of the New Americans' Pavilion from the lower roof. Photograph by author.

The New Americans' Pavilion design-build project provided significant learning opportunities for students of architecture at Syracuse University to improve their understanding of the relationship between design and construction, while also serving the surrounding community. As such, the design project serves as a test-case for the agency of architects to positively impact their localities while simultaneously educating students of architecture.

DESIGN

We began the design process by working with the new American farmers and farm managers to understand the flows of resources in and around the site. We explored how produce is grown, harvested, and sold, and how the profit is then fed back into the operation. We also looked at feedback loops for waste, solar electricity, and water. We rehearsed an efficient process for washing, packing, and storing farm produce and diagrammed a layout of fixtures and equipment that would support this process in order to decide on the structural module of the building and the associated roof spans.

Based on this analysis, we designed the pavilion as a 'double-shed' with one shed devoted to efficient washing, packing, and storage of produce from the farm, and the other shed free for community dining, education, and social events. The double-shed form references local agricultural vernacular architecture, while customizing the typology for the specific conditions of the SCHF program and its site. The roof slopes of the two sheds are optimized for competing conditions: toward the south, the roof is sloped to maximize incident solar radiation on the roof-mounted solar panels; toward the north, the roof is sloped to the minimum allowed by the roofing manufacturer's warranty in order to minimize the volume of the cold-storage space beneath, as well as to minimize the amount of framing and roofing material necessary. The unequal slopes meet at different heights and therefore produce a north-facing clerestory which helps to admit ambient light into the center of the plan.

Structurally, the building is designed as a pole-barn on a concrete slab on grade with posts, beams, knee-braces, rafters, and purlins made from commonly available dimensional lumber. The pole-barn frame is infilled on the western edge of the washing and packing shed with an enclosed storage area, which is split into two spaces: an insulated 8'-0" x 8'-0" room for cold storage, and an unconditioned 8'-0" x 14'-0" dry storage room. The enclosed area of the frame is located on the western edge of the plan in order to block the hot summer afternoon sun and also to block wind-driven rain which mainly comes from the west of the site. The eastern edge of the plan is left open to admit daylight in the early morning and to provide open connection to the refugee farmers' plots to the east of the site. Since the pavilion will be used primarily in the summer months, the shaded thermal mass of the concrete slab will help to keep farmers cool while they use the space, especially when the slab is frequently sprayed with water during the washing and packing activities.

The cold-storage space is designed to be refrigerated by a conventional window-unit air-conditioner, whose thermostat is modified to cool to temperatures of 34-38 degrees(F) using an experimental product called CoolBot™. The CoolBot™ uses an electric heating element attached to the air-conditioner's thermostat in order to create the appearance of temperatures above the air-conditioner's minimum setting until it cools to the desired refrigeration temperature.[3] This technology is significantly less expensive than standard commercial refrigeration options and is simple to install and maintain. Access to refrigeration will improve the productivity of the farm by allowing farmers to keep more produce fresher for longer periods of time.[4]

The cold-storage space is insulated to R30 on all six sides with foil-faced polyisocyanurate foam boards in order to diminish heat gain through the building envelope and reduce the load on the air-conditioner. The electricity consumption of the air-conditioner, lighting, and other electrical devices used in the pavilion is designed to be offset by the electricity production of the 4.8kW rooftop photovoltaic array such that the pavilion is expected to produce more electricity than it consumes. The system will be grid-tied in order to make sure it is reliable and requires limited maintenance. In this way, the pavilion will allow new American farmers to wash, pack, and keep their produce fresh while limiting carbon emissions and operating costs.

The pavilion's storage space is clad in low-cost plywood T1-11 panels similar to many agricultural sheds in the surrounding area. However, while many agricultural buildings are painted red, following the archetypal barn appearance, the enclosure of the storage spaces at the New Americans' Pavilion is stained blue, a more unusual color. The choice of blue reflects the specifics of the population that the building is design to serve. Many refugees who participate in SCHF's programs are deaf or have serious hearing-loss. In New York State, "there is a growing population of deaf refugees due to the large Deaf Community around [the National Technical Institute for the Deaf (NTID) at the Rochester Institute of Technology] which offers education in sign language."[5] Many farmers at SCHF communicate using American and/or Nepali Sign Language, and the majority of educational programs and events held at the farm include live sign-language interpretation.

According to the principles of the "DeafSpace Project" established by architect Hansel Bauman (hbhm architects), visibility is crucial for clear and comfortable communication in sign-language, and "color can be used to contrast skin tone to highlight sign language."[6] Since the refugee population at SCHF is highly diverse both in terms of geographic origin and ethnicity, the proper color backdrop to facilitate visual communication is not obvious at first. For a speaker with a light skin tone, a dark-colored background contrasts well; for a speak with a dark skin tone a light-colored background contrasts well. [7] Based on research conducted by the architectural practice Lewis Tsuramaki Lewis in the design of a new residence hall building at Gallaudet University in Washington, D.C., we arrived at the hypothesis of using a shade of blue for the enclosure color in order to provide a contrasting background for a wide range of skin tones.[8]

We assembled a range of possible shades of blue and surveyed the deaf community and the community of sign-language interpreters at SCHF to decide which specific color would suit our purpose best. This process resulted in the choice of a blue-grey stain that will provide the requisite contrast for visual communication in hand motions and facial expressions, but will not fatigue the eye over a long period of time, as a brighter or more saturated shade of blue might. We intend for the unusual color to be a conversation starter for people visiting the farm to learn about the specific needs of the deaf community at SCHF.

The pavilion design intersects various criteria of sustainability and accessibility into a synthetic whole which makes legible its constraints. Present-day global exigencies of climate change, refugee migration, food security, and accessibility are mutually exacerbating conditions. While architects cannot solve these global scale problems alone, the design of the New Americans' Pavilion serves as an example of how architects have agency at the local scale to model synthetic, integrative design practices which have the potential for broader impacts.

CONSTRUCTION

The New Americans' Pavilion was constructed over a period of one year from 2020-2021 by a combination of community volunteers, professional contractors, and paid student Research Interns. Research Interns also participated in the design and documentation process together with the author of this paper. While planning the construction process, the various stages of construction were separated into tasks which required high skill and those that required less skill. The design/build team completed the lower skill and lower risk tasks, while professionals were hired to complete higher skill tasks involving the building's primary structure and electrical systems.

Figure 2. Structural Framing. Photograph by author.

Figure 3. Design-build team (left to right): Jacob Gigler (Salt City Harvest Farm Executive Director); David Shanks (author); Shaan Lakshmanan (Research Intern); Jerry Jiuye Yan (Research Intern). Photograph by Helna Zhen.

Site preparation and excavation was completed by a team of community volunteers including members of the board of directors of Salt City Harvest Farm. Concrete footings and piers were pre-cast by a professional contractor and set into place by the team of community volunteers. Volunteers prepared the underground drainage and electrical conduit, and also prepared reinforcing steel and form-work for the concrete slab on grade, which was poured by a professional.

The primary frame of the pole barn structure was constructed by a professional contractor, as was the corrugated steel roofing. Phil Hofmeyer, Associate Professor of Renewable Energy at SUNY Morrisville, installed the roof-mounted photovoltaic system and prepared it to be tied to the electrical grid. Cost over-runs due to the increased cost of lumber, OSB, and other construction materials during the COVID-19 pandemic left us short of the funds necessary to run electrical lines to the site, so the photovoltaic and cold-storage systems are not yet operational. Further rounds of fund-raising are expected to deliver the necessary monies to get the system up and running by the start of the 2022 growing season.

Construction of the cold and dry storage enclosures was completed by a team that included the author of this paper, paid student Research Interns, and SCHF employees. By participating in both the design and the construction processes, students in the design-build team learned important lessons about how to incorporate constructional considerations into the design process. Students also estimated material quantities and costs, and worked with the author to purchase materials and manage the project budget, experiences which are valuable but relatively rare in schools of architecture. Although the construction techniques used in the project were relatively conventional, that does not mean that the building process was easy, and we made many mistakes along the way. Together as a team, we treated each challenge we faced as a learning opportunity to ask questions and seek advice from the farm community, among whom a great deal of construction experience already exists.

ASSESSMENT

We intend to track a range of metrics in order to assess the success of the pavilion project. One important metric will be the increased participation in the farm programs, as well as increased farm productivity, and farmer profitability as a result of the pavilion building and its cold-storage facilities. We will track enrollment and attendance in farm educational programs

Figure 4. New Americans' Pavilion, September 2021. Photograph by author.

as well as the number of farmers using the community farm to grow food. The amount of food harvested from the farm and processed through the pavilion will be measured by type of crop and weight. Sales of produce at SCHF and local farmer's markets will be tracked in dollar amounts. These data will be compared with information from prior seasons in order to measure any improvements related to the construction of the New Americans' Pavilion.

Another metric of the project's success will be the amount of carbon emissions that we will be able to offset through the roof-mounted photovoltaics. A farm using a typical refrigeration unit connected to the electrical utility would produce a certain amount of carbon emissions, but our design improves the energy efficiency of the cold storage and also offsets the electricity usage with clean, emissions-free photovoltaic energy production. By comparing data on energy consumption and carbon emissions in a similarly sized conventional agricultural refrigeration setup with data from our specific designs at SCHF, we will be able to gauge the effect of our work in diminishing greenhouse gas emissions.

While we have not been able to gather these performance data just yet, since the pavilion is still not complete, we have been able to assess a less quantitative criterion of the project's success, which is the degree to which it fosters community cohesion through events like harvest dinners, educational programs, and fund-raising events for the farm. The pavilion was occupied by the community as soon as the roofing was completed at the start of the 2021 growing season. Throughout the summer, while the design-build team built the non-structural framing and storage enclosure, the new American farmers took advantage of the micro-climate produced by the shade of the pavilion structure and its thermally massive concrete slab to take a break from working in the heat of the sun, and to simply hang out and socialize.

The pavilion has been used to host a variety of different gatherings in the refugee community, such as a celebration on World Refugee Day. The pavilion is positioned to benefit a wide network of community organizations not limited to Salt City Harvest Farm. Organizations such as SYRAP (Syracuse Refugee Agriculture Program) and RISE (Refugee and Immigrant Self-Empowerment) have regularly used the pavilion to hold educational programs for nutrition and farming instruction. Farm to Fork 2021 also hosted a dinner prepared by local Syracuse chefs to raise money for their organization and Salt City Harvest Farm. SCHF will continue to use the pavilion for fund-raising purposes and events which raise awareness of their mission both locally and nationally.

Although the electrical system is not yet up and running, and the cold-storage enclosure will not be used until next season, it is already clear that the pavilion serves its purpose as a hub for the new American community in Syracuse to socialize, teach, learn, and eat. Going forward, we hope to further assess the strengths and weaknesses of this project with in order to produce and disseminate knowledge within the architectural discipline and beyond about how we can work together to create more equitable, sustainable, and nourishing environments in our local communities.

Figure 5. Open Farm Day, August 2021. Photograph by SCHF.

ENDNOTES

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