Education Center for Beardsley Community Farm

JENNIFER AKERMAN & ROBERT C. FRENCH
University of Tennessee-Knoxville
A NEW FORM OF DESIGN-BUILD

Design-build teaching and learning has the potential to advance both the practice of architecture and the process of educating architects. Students and faculty from [Name Redacted] developed a new form of design-build to produce public work with an engagement focus, creating an education center for a non-profit public farm specializing in sustainable urban agriculture. The design-build effort used architecture to foster meaningful community engagement, teaching students fundamental issues of design, craft, and leadership.

A unique collaborative process—led by design-build architecture students and faculty and supported by professionals, city officials, and industry partners—allowed our team to exceed bureaucratic and budgetary limits that often prevent high-quality public architecture from being possible. Students and faculty were invited to join the collaboration after pro-bono efforts of a professional architecture firm and contractor failed to meet budget through three consecutive design-bid cycles.

The design approach is characterized by a series of overlays and contrasts, just as Beardsley is itself a contrasting entity—a farm within the urban fabric. Ideas of the contemporary vernacular are situated at all scales: site, plan, and detail. The architecture is designed to strengthen the Farm’s outreach mission by making places for meaningful community engagement. Comprehensive issues of sustainability and craft were critical, as was the emphasis on design leadership and the ethical imperative of contributing to public space.
LEARNING OBJECTIVES: ETHICAL AND INNOVATIVE PRACTICE
A unique curricular structure engaged students through a design integration studio, design-build seminars, and a sustainability seminar. All told, approximately fifty undergraduate and graduate students contributed through enrolled coursework, with two becoming project research assistants post-graduation. More than fifty additional students and faculty contributed as volunteers.

KEY LEARNING OBJECTIVES MET
PUBLIC ENGAGEMENT ETHIC Students reframed the project to one of community service based on what they learned from the farmers, residents, and from their study of a complex urban site. Students volunteered throughout design, facilitating deep understanding of needs.
CONCEPT-TO-REALIZATION PROCESS Fundamentals of design-build bridged ideation to realization, in both the built artifact and collaborative process.
CONSTRUCTION INNOVATION Students designed and built a novel triple-wythe brick wall assembly that provides structure and environmental performance, among other innovations.

LEADERSHIP
STUDENT DESIGN-BUILD PROCESS
Students worked collaboratively to arrive at a unified approach, converging twelve independent ideas into one team-generated design. Concept and design refinement continued throughout construction.
A FARM IN THE PARK
Beardsley Community Farm promotes food security and sustainable agriculture through education and community outreach. They have operated out of a public park in an economically-challenged urban neighborhood for eighteen years, making do with very limited resources. The median annual income in Mechanicsville is $6,000. With the help of volunteers, the Farm provides 10,000 pounds of food annually to other community-oriented entities nearby. Though progress has been made, tensions exist between the farm and its neighbors.

"Thank you for reminding us that this is about more than making a modest shelter to support Beardsley."

—[Name Redacted], Mayor’s Representative, Head of Public Works, [City Redacted]
COMMUNITY ENGAGEMENT
The project is understood to be more than a modest farm shelter. Rather, everything is designed to be a teaching tool operating in service to the Farm's mission. Design goals include:

- Design as Catalyst for Engagement
- Minimize Conditioned Footprint / Maximize Public Space
- Contemporary Vernacular
- Providing Identity for the Farm in the Community they Seek to Serve

ROCK AND TREE
The rock represents a durable heart embedded in the earth, while in the foreground the tree shrouds the rock with dappled light. As a group we agreed that the simple palette of rock and tree emphasizes an agrarian aesthetic and the economy of means inherent in a vernacular ethic.
“This is a public farm. It’s yours and it’s ours. When the door is open, the farm is open.”

—[Name Redacted], Client Representative, Head of Urban Agriculture for [City Redacted]
DESIGN INTENT: SOCIALLY RESPONSIVE DESIGN-BUILD

FLOOR PLAN KEY
01. Outdoor Classroom  f. Bike Parking
02. Classroom  g. Vegetable Washing
03. Mudroom  h. Boot Washing
04. Director’s Office  i. Bottle Fill Station
05. Shared Workspace  j. Built-in Storage
06. Toilet  k. Built-in Bench
07. Outdoor Storage  l. Built-in Desk
a. Bamboo Screen  m. Custom Door
b. Entry Gate  n. Permeable Pavers
c. Roof Edge (above)  o. Accessible Planters
d. Rain Cistern  p. Visitor Parking
e. Dry Well
STUDENT DESIGN-BUILD SCOPE

Students were primarily responsible for building, fabricating, and installing the following in collaboration with faculty, builders, and fabricators:

- STUDENT DESIGN-BUILD SCOPE
  - CONCRETE DETAILS
    - sills, lintels, beam seats
  - FIBER CEMENT SIDING
  - WATER-JET STEEL SIGNAGE
    - building address, parking, toilet rooms
  - AMPHITHEATER
  - CASEWORK
    - storage, worktops, benches
  - CASEWORK
  - ROOF + FRAMING
  - SCREEN WALL
  - STRUCTURAL MASONRY
    - up to +/- 6'-0" a.f.f.
  - COLUMN BASES
  - FIBER CEMENT SIDING
  - CONCRETE DETAILS
    - sills, lintels, beam seats
  - ENTRY DOORS
  - PARTITIONS
  - CASEWORK
    - storage, worktops, benches

*student design phase exploded axon diagram of building components*
**SUSTAINABILITY**

Students addressed sustainable design comprehensively. The project is designed to achieve LEED Silver certification and it addresses guidelines from AIA’s Committee on the Environment and the Living Building Challenge.

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**SUSTAINABLE DESIGN GOALS**

01. **REGIONAL + COMMUNITY DESIGN:** Visitors to the farm learn about sustainable design features of the new building.

02. **SITE:** Reuse of an existing tennis court in a public park, close to many community amenities (bus lines, library, elementary school, day care). The design strengthens farm ecologies, providing water for crop irrigation and habitat for bees.

03. **BIOCALORIC DESIGN:** Outdoor rooms provide refuge from weather and extend the time that people can gather and work in communal space.

04. **LIGHT + AIR:** Well-considered natural daylighting is a key design feature, providing views, balanced light, and natural ventilation.

05. **WATER:** Rainwater is harvested via cisterns and reused to irrigate farm crops, or diverted to dry wells. Permeable surfaces are maximized.

06. **ENERGY FLOWS:** The solar-ready roof is capable of generating a significant amount of energy, reducing the farm’s energy footprint.

07. **MATERIALS:** Masonry is the main structural and enclosure system, taking advantage of a local, natural, and durable resource. The project reuses waste material inventively: converting invasive bamboo into an architectural screen wall, using waste masonry as fill for the amphitheater’s gabion walls, and reusing scrap structural LVL beams as the countertops and benchtops. Regional, sustainably-harvested plywood was used for all casework.

08. **LONG LIFE, LOOSE FIT:** The ethic of making the most for the least means designing all spaces as multi-purpose and privileging public access.

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student research into Living Building Challenge Petal Certification

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daylight and views, materials, long life / loose fit

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student diagram on visitor education: full farm tour (green path and dots) with “Eco Pit Stops” (orange dots) where sustainable design features are discussed

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reclaimed materials

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rainwater harvesting
DESIGN-BUILD PROCESS

progress review at construction site

pre-cast concrete sills, lintels, and beam seats

steel column bases

fiber cement siding
entry doors: poplar, glass, steel

DESIGN-BUILD PROCESS

architectural screen wall of harvested invasive bamboo stalks

casework: regional plywood
DESIGN-BUILD PROCESS

amphitheater for park engagement

gabion walls filled with reclaimed/waste masonry
outdoor classroom, custom entry doors; mudroom and public restroom in background
A MODERN URBAN FARM

transparency of layered facade from south-west

exterior details

outdoor classroom with Farm resident and custom doors beyond

mudroom and public restroom
A MODERN URBAN FARM

window-seat library, custom doors

shared workspace

casework detail

multipurpose classroom

mudroom, vegetable wash
A MODERN URBAN FARM

Custom casework in storage hallway looking toward shared workspace.

Custom casework looking toward basketball court and farm plots.
CONCLUSIONS

Though a remarkable project was achieved and a cohort of young architects is now motivated to design, build, and serve, this was not a perfect process. Because of the academic team’s leadership, the city went further than they would have in backing a project that foregrounds engagement and design excellence. But, pressure within the collaborating team to fulfill differing goals—quality vs budget vs schedule—limited what could be achieved. Tensions between the farm and neighbors remain, evidenced by sporadic vandalism. But now when the Farm is open, basketball players visit to seek shade, get water, and use the restroom, suggesting the architecture is eroding boundaries and facilitating dialog between the farm and the community it seeks to serve.