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## RURAL STUDIO AND THE FRONT PORCH INITIATIVE: THE OPPORTUNITIES AND CHALLENGES OF PLACE-BASED RESEARCH

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### ABSTRACT

Harnessing the applied student research developed through design-build projects at Auburn University Rural Studio, the Front Porch Initiative aims to develop a scalable, sustainable, and resilient process for delivering homes in underserved rural communities. Student research forms the basis for the Initiative's work, which extends its reach and impact through collaboration with housing providers and policymakers.

A unique process of prototype home development and versioning of the homes engages students in the research of home affordability at different points in their architectural education. Graduate students undertake a comprehensive project: designing, developing, and ultimately building a prototype home for a local client in Rural Studio's West Alabama service area. Third-year undergraduate students then utilize those prototypes for in-depth study and development of a specific topic related to contemporary issues in housing, such as accessibility, energy performance, material research, or emerging building technologies. Faculty working through the Front Porch Initiative can synthesize that information and deliver it as products to housing providers outside of Rural Studio's service area.

Currently, student research is driven by the particular demands of creating housing in the rural communities of West Alabama. This provides students the opportunity to deeply investigate and respond to local conditions, a key component of Rural Studio's teaching pedagogy. However, as the Front Porch Initiative continues to expand the geographic, climatic, and sociocultural footprint of the housing research, Rural Studio faces new and different challenges and opportunities presented by other localities. As the Studio moves forward, it works to better understand how the local and particular can inform a broader conversation on rural housing while educating the next generation of citizen architects.

**Keywords:** Affordability, Design-Build, Housing, Place-Based, Rural

### 1. INTRODUCTION

Established in 1993, Auburn University Rural Studio gives architecture students a hands-on educational experience while assisting the underserved communities of Alabama's Black Belt region. A fiercely place-based program, Rural Studio operates within a 25-mile radius of

its home base in Newbern, Alabama. During their third and fifth years of undergraduate studies, as well as a through a new Master of Science in Architecture program, Auburn University architecture students have the option to move off the main campus and relocate to Newbern (an approximately 2.5-hour drive west of Auburn University) for an immersive design-build experience. The Studio engages in projects that promote sustainable rural living, providing architectural works focused on housing; education; safety and welfare; health and wellness; and food access. Students design and build projects with varied scales and programs, including homes, community centers, farmers' markets, a library, a fire station, and a town hall, totaling over two hundred built works to date.

After twenty-six years of performing place-based learning, Rural Studio is pursuing opportunities to extend its research agenda beyond the on-the-ground student experiences. Through the Front Porch Initiative, the Studio is beginning to externalize its housing affordability research. This paper examines Rural Studio's applied research methods and strategies for disseminating the research outcomes to a broader audience. It also considers the transfer of knowledge between external partners and place-based student researchers. To begin, the paper summarizes how the consideration of housing design has evolved over the Studio's history, beginning with singular client homes and into the development of prototype homes through the 20K Project. Examples of prototype development, refinement, and variations illustrate the iterative nature of the homes. Next, the paper articulates how student work from Rural Studio is disseminated to an expanded network through the Front Porch Initiative. Finally, the paper posits how external feedback might influence the place-based work of the Studio, creating both opportunities and challenges.

## 2. THE EVOLUTION OF HOUSING PROJECTS AT RURAL STUDIO

Rural Studio began by designing and building homes for families in the underserved communities of Hale County. The Studio's first project was a new home for Shepard and Alberta Bryant to replace their substandard residence. The designs of this and other early client homes were specific to the families for which they were built and were often—out of budgetary necessity—composed of found, reused, or repurposed materials. Less focused on replicability or affordability, the homes were a recognition that good housing is not always affordable, but that people deserve it anyway. When successful, the homes were reflective of their climatic and sociocultural contexts, featuring raised floors, high ceilings, big roofs, and large outdoor rooms (Figure 1).



Figure 1: The Harris "Butterfly" House features a large roof that collects rainwater and a sizable porch for outdoor living. (Timothy Hursley)

After years of designing custom homes for local families, the Studio began to question if the resources put into the projects could be used to affect greater change. As a land grant institution, Auburn University has a mission to improve the lives of the people of Alabama and beyond. Following the university's service and outreach mission, in 2004, Rural Studio began development of the 20K Home, an affordable, replicable house prototype. The original goal of the project was to design a home that could be built for \$20,000, the estimated loan that a person living on mean social security could afford through the USDA 502 Direct Loan program. However, as the project has continued to evolve, the Studio's focus has shifted to examining the total cost of homeownership: both the cost of construction and the ongoing costs of operations and maintenance.

The 20K Homes still integrate concepts from the first client homes, such as resourceful use of materials and attention to local social conditions. Like the client homes, the 20K Homes learn from the vernacular buildings of the area, with many featuring large roofs with generous overhangs to protect and shade the walls, high ceilings and cross-ventilation for passive cooling, and pier-and-beam foundations to protect the homes from water and pest intrusion.

Since 2004, over twenty-four prototypes have been designed, built, and given to local community members. Each prototype is named after the homeowner for whom the home was first built. These prototypes serve as a growing library of local case studies for new students, who study the previous homes before designing a new prototype. Over time, the designs have been refined and influenced by many voices, including student teams, faculty advisors, professional consultants, and clients. By focusing on a variety of spatial conditions, client needs, and potential site arrangements, the prototypes form a Product Line of homes (Figure 2). While each new student team works to develop a new design, they both improve upon past research and work to create designs that expand the client base that the homes can serve.



Figure 2: 20K Home prototypes. From left to right: Dave's, MacArthur's, and Joanne's Homes (Timothy Hursley)

### 3. 20K PROJECT

The 20K Home began as and remains a student research project. Depending on year level, students interact with the project in different ways. Graduate students design and build new prototypes that focus broadly on issues of equitable, efficient, and affordable housing. Third-

year undergraduate students create variations of the existing prototypes and alter them through deep analysis of the needs of a specific client and site. The feedback loop between third-year and graduate students fosters continuity from year to year and provides a framework for refining ideas.

### 3.1 Graduate Projects

At the graduate level, the coursework is designed to provide advanced students with a comprehensive design and construction experience. Each year, a new team of approximately four students tackles broad ideas related to increasing access to quality, affordable housing. Over the course of twelve months, they design and build a complete home. Focusing on the general needs of affordable housing, a client is not assigned to the team until after the design work is largely complete. Clients are selected for the students as the design challenge emerges, so the final product is appropriate for the individual receiving the home.



Figure 3: The student design for Ann’s Home analyzed Idella’s Home, a previously designed prototype, to compare the actual placement and use of furniture in the house (right) as compared to the design assumptions (left). This analysis influenced decisions about adjacencies and door sizes in their design. (Auburn University Rural Studio)

The concepts graduate students use to develop their design brief are based on observations of need, aggregated data, and experience gained from previous projects. For example, Ann’s Home focuses on aging-in-place and the changing needs of an individual living in one home over the course of his or her lifetime. Design features such as wide-set doors, an accessible bathroom, and bedrooms with increased connections to living spaces ensure that occupants are still able to comfortably participate in family life as they age. Studying the use of previous homes influenced their home design (Figure 3). Often, students can create linkages between seemingly unrelated issues through their designs. In another project, Turner’s Home, students used ANSI A117.1 and ADA guidelines to design a home that could accommodate individuals with ambulatory disabilities. The raised home features a ramp integrated into the front porch (Figure 4), a roll-in shower, and increased clearances and turning radii throughout the house. Intelligently, the student team recognized that if a

home is designed to accommodate a person with an ambulatory disability, then that person may have trouble seeking shelter during a storm event. The year before Turner's Home was designed, a series of exceptionally strong tornadoes devastated parts of West Alabama. While some local communities have designated shelters, they can be miles away in rural areas, which can be particularly challenging for elderly or disabled individuals to get to. Therefore, Turner's team designed an above-ground tornado shelter, following FEMA guidelines, which is accessible from inside the house. The ability to shelter in place for homeowners with limited mobility makes a home more livable and life more resilient.



Figure 4: Turner's Home pairs ambulatory accessibility with a tornado safe room. (Timothy Hursley)

### 3.2 Third-Year Projects

Each semester, around ten to fifteen third-year architecture students move to Newbern and work on a single project as a studio team. Each two-semester, nine-month academic year, students build one house for a local community member. Building on the technical coursework taught during their second year, the third-year students are able to apply lessons of structural, environmental, and material assembly design to a real building. Students engage with a real client and site, performing a methodical analysis of client need and field conditions. These projects contribute to the larger body of 20K research by testing alternative structural strategies, enclosure details, and plan layouts based on their analysis of the site and client.

Third-year students study narrow, yet deep architectural issues. Focused design problems, such as alternative foundation systems, allow the students to fully engage the design of details. Using wood frame construction in third year teaches students basic construction skills and prepares them for alternative and more advanced systems in their fifth year of study. Practically, starting with a prototype helps the Studio meet its goal of completing the house on schedule. The focused third-year research can compare and analyze the built details and performance of the existing prototypes, quickly test and improve alternative architectural details, and record and catalogue alternative systems for future study.

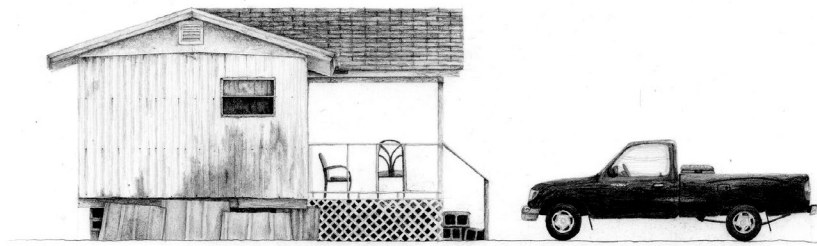


Figure 5: The north elevation of Ree's previous home. Her porch surfaced as an important aspect to her lifestyle and is evidenced by the chairs. (Will Hall, Auburn University)

### Design Process

The relationship with a real client is key to the third-year research (McGlohn 2019). Students meet their client at the beginning of the design process and work closely with the client to determine which 20K prototype is most appropriate for the project. The first step in the third-year's research process is gathering information about the 20K Project prototype houses. This process runs in groups; students study the construction documents, design intent, home performance, and the successes and weaknesses of the prototypes. Concurrently, students gather information about the client's lifestyle and study his or her existing home for clues about patterns of life. They record what they observe through meticulous, hand-rendered elevations that highlight particular aspects of life that translate into design criteria (Figure 5). Often, these observations become evidence for careful plan modifications, door arrangements, or porch configurations that respond to the particular needs of the client. This close observation of how clients use their current homes frequently improves the usability of the prototypes.



Figure 6: Ree's Home. Her porch remains an important aspect of her life. (Timothy Hursley)

For Ree, having a street-facing porch is an important part of her lifestyle. A version of Joanne’s House was modified for Ree after renderings and interviews highlighted her patterns and desires, and an analysis of the prototype homes showed Joanne’s to accommodate those patterns most closely. Adjustments to Joanne’s Home included the addition of a ramp up to the porch and a direct connection to her sister’s house next door. The foundation was also swapped from a pier-and-beam system to an elevated slab. This allows for a more reasonable ramp length, only having to climb 15 inches instead of 36. Two closets were added in the floor plan. An energy heel truss was used to increase the insulative value at the wall-to-ceiling connection. Ophelia, another third-year client, sleeps in her living room because she feels safer and likes to keep the television on at night. Her son also lives with her and helps maintain the house and yard. Although Ophelia’s new home will only be a one-bedroom house, her son will move in with her. To accommodate this beneficial arrangement, a “quarter bedroom,” which is simply a small nook in the living room for her daybed, was added, and the back door was moved to the bedroom. This allows her son to come and go to work without disturbing Ophelia at night. Exploring new plan arrangements that support various living arrangements makes 20K Homes more versatile and resilient. Students learn to make judgements based on the core values of the 20K Project.

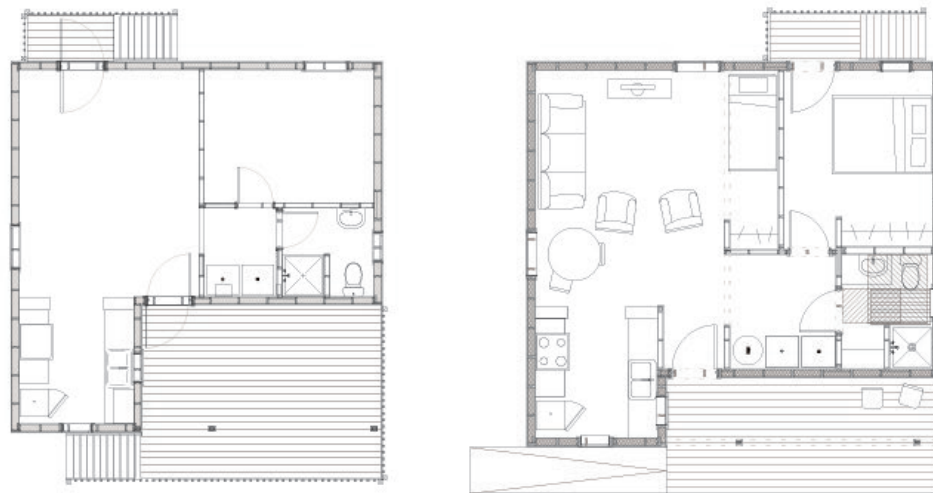


Figure 7: Joanne’s Home and Ophelia’s Home. A sleeping nook was included to accommodate her daybed and long-term overnight guests. The bathroom now meets FHA size requirements. (Auburn University Rural Studio)

#### 4. FRONT PORCH INITIATIVE

Front Porch Initiative—an outward-facing branch of Rural Studio—is dedicated to addressing housing quality and affordability while promoting homeownership in rural communities. Funded through contracts and grants, the Initiative provides added capacity to Rural Studio; the work is *in addition to* the Studio’s academic mission. Built on sixteen years of place-based research, Front Porch Initiative has developed a three-pronged approach to addressing housing affordability. First, the Initiative offers *products*—in the form of prototype designs—that link home performance to affordability. Second, the Initiative advocates for *policies* that facilitate equitable opportunities for homeownership. And third, the Initiative works with *partners* to extend the impact of Rural Studio’s housing affordability research.

Through Front Porch Initiative, Rural Studio's reach has expanded to a regional area that encompasses the southeastern United States. Through a series of "field tests," Rural Studio engages with housing providers, also referred to as "field test partners," by supplying the partners with house prototypes and technical assistance. In exchange, the field test partners agree to work closely with Rural Studio, providing feedback and data about project implementation. Currently, Front Porch Initiative is actively engaged in projects with housing providers in Alabama, Florida, South Carolina, and Tennessee. Additionally, the Initiative works with governmental, industry, and subject matter experts to engage the nonarchitectural barriers to housing affordability, including financial, insurance, and land use considerations. The relationship between Rural Studio student research, Front Porch Initiative, housing provider partners, and housing policy stakeholders is defined by reciprocal knowledge building and information sharing (Figure 8).

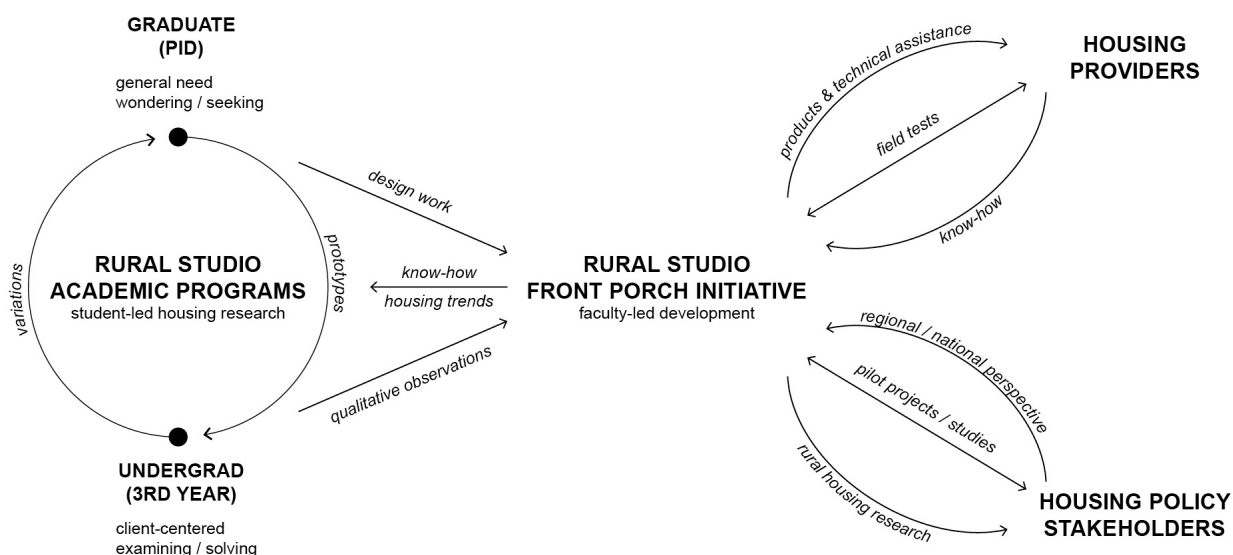


Figure 8: The Front Porch Initiative facilitates the exchange of information between Rural Studio and a larger network of housing providers and policymakers. (Auburn University Rural Studio)

#### 4.1 Project to Product: Disseminating the Research

The Front Porch Initiative builds from a vast body of student research collected over sixteen years of place-based learning. The research includes both the iterative design work and associated prototypes as well as qualitative observations about rural housing patterns and conditions. Both the designs and the contextual information are aggregated, synthesized, and disseminated to external organizations focused on housing.

Design research from the Graduate and Third-Year Programs is transferred to the faculty-led Front Porch Initiative team, where it is adapted for use with field test partners. This is an ongoing and dynamic process, with the work continually informed and evolved through the most recent student projects. For example, as material selections, building assemblies, and detailing are refined at Rural Studio, those findings are integrated into the expanding library of information that the Front Porch Initiative utilizes when working with housing providers. As a design-build program, Rural Studio's research not only covers the design aspects of the home but expands beyond the conventional purview of the architect into the means and



methods of construction. For example, just as the design of a building assembly can be refined to improve its thermal performance, the process of constructing that assembly can be refined to streamline coordination between trades, shorten the construction schedule, or facilitate other construction management outcomes.

Work with field test partners has also necessitated the development of additional details that accommodate best practices across multiple states, adopted building codes, climate zones, and housing delivery models. The complexities of implementing prototype homes in an increasing variety of situations allows both faculty and students to reassess and reimagine the concept of a “Product Line” of homes. Instead of containing rigid, unalterable designs, the evolved Product Line provides a flexible framework of elements that can be applied across home prototypes, providing a range of variations that tailor the homes for individual housing providers, clients, and sites.

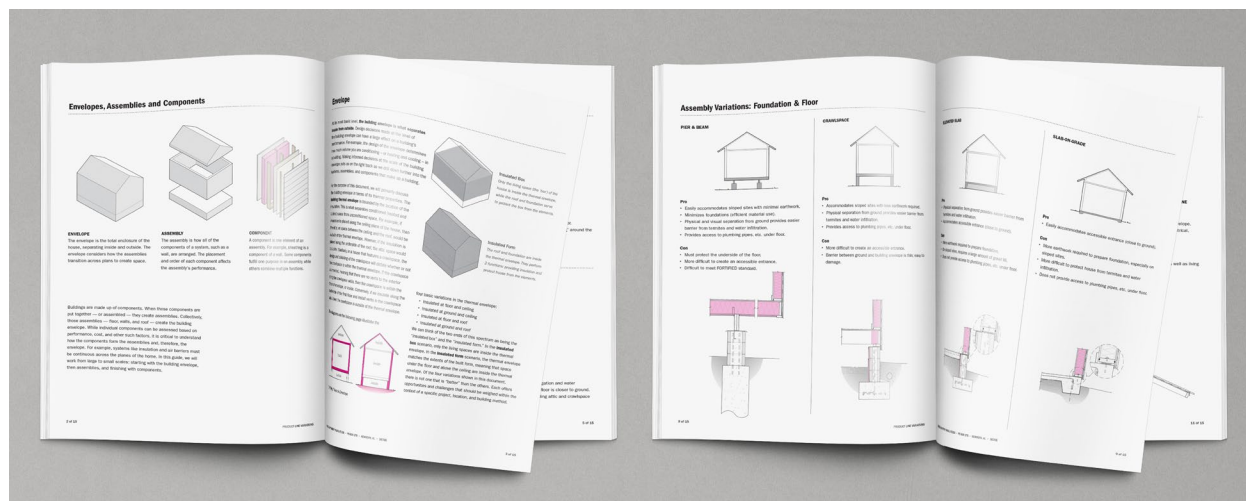


Figure 9: Design variations are described in documents intended to plainly convey technical information to field test partners. (Auburn University Rural Studio)

The Front Porch Initiative team is responsible for synthesizing the designs of the homes, along with their variations, and communicating the design intent to field test partners. This process begins by analyzing the field test partner’s needs and communicating the opportunities and challenges of different design variations. Documents such as the Product Line Variations booklet are utilized to provide context and criteria for making design decisions (Figure 9). Once elements of the home have been selected, a drawing set specific to the project is created. Finally, the Front Porch Initiative incorporates knowledge of building construction into documents that illustrate not only what to build, but how to build and—most importantly—why things should be built in a specific way. The Construction Resource is part of the set of documents provided to field test partners alongside construction documents (Figure 10).

In addition to the design of home prototypes, Rural Studio’s applied research offers valuable transferable research that informs a larger understanding of rural housing. In many ways, the object of the house provides a way to illustrate unseen linkages, patterns, and systems. These observations, gained through years of living and working in rural West Alabama, provide insight into the specific challenges and opportunities of rural living. Though observed locally, many of these concepts translate to other rural communities

across the country. For example, many of Rural Studio's clients live in settlements of multigenerational kinship networks on property passed down from ancestor to descendant over many decades. These kinship networks provide a source of resilience for the extended families through sharing of resources such as food, transportation, and childcare. Accordingly, if the network is disrupted or separated, the negative effects can ripple through the entire extended family. However, the strengths of these networks are largely overshadowed by known challenges, such as heir property, which can prevent families from leveraging traditional mortgage financing or access to federal assistance programs for home repairs.

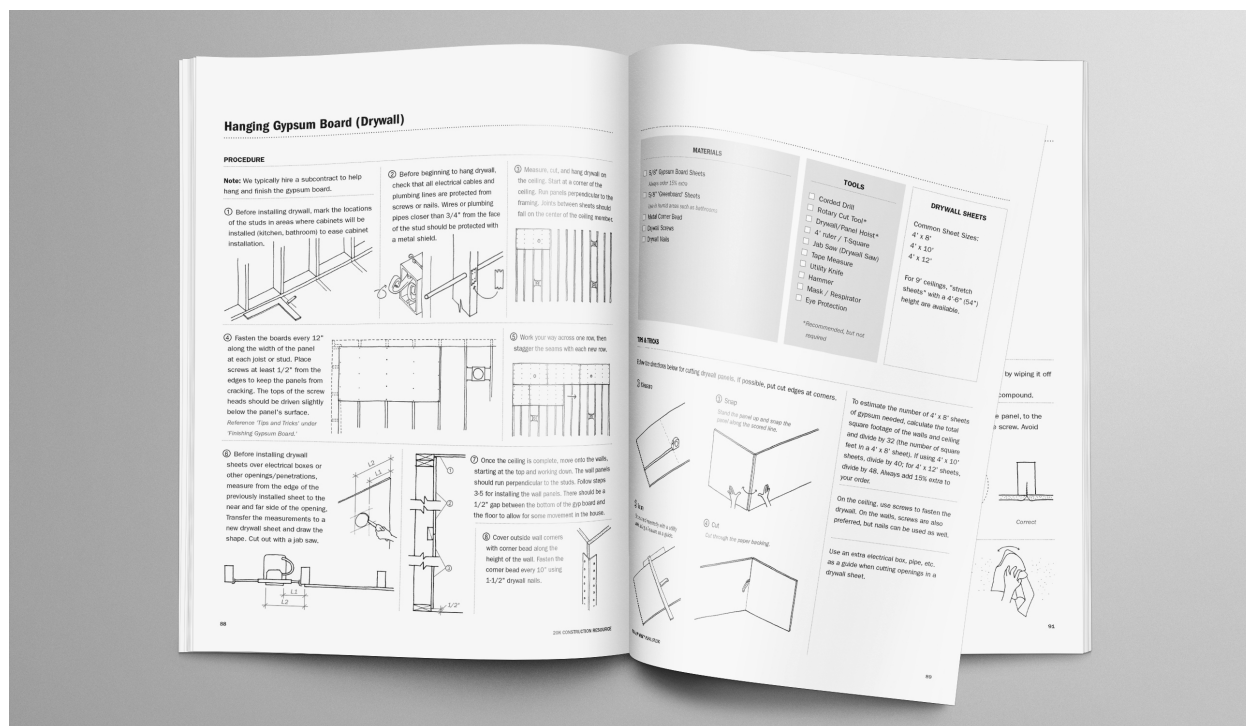


Figure 10: The Construction Resource walks field test partners through how to build and why things are built a specific way. (Auburn University Rural Studio)

The breadth of Rural Studio's community work also allows the program to better understand the systemic nature of housing affordability. For example, in 2004, Rural Studio completed construction of a firehouse for the newly formed Newbern Volunteer Fire Department. Though a firehouse is seemingly unrelated to housing affordability, the availability of fire protection services made homeowner's insurance more readily available and affordable, which, in turn, lowered the barriers to entry for acquiring mortgage financing for local homeowners. Intimately understanding the obstacles to housing affordability is the result of Rural Studio's long-term commitment to living and working in rural West Alabama. By sharing insights into the challenges and opportunities with other stakeholders, Front Porch Initiative is advocating for policies conducive to rural housing.

## 4.2 Product to Project: Incorporating External Feedback

In addition to collecting and disseminating housing research to a broader network of partners, Rural Studio benefits from information shared by external partners. This comes in the form of knowledge of design and implementation of high-performance homes and through a regional and national perspective on housing and available housing resources. Taking what the field test partners learn and working to create new learning objectives for students is the faculty's responsibility to continuing the applied research.

The transference of knowledge to know-how, through the designing and building of a structure is a key learning outcome for Rural Studio students. In the same manner that students learn from the built projects that precede them at Rural Studio, the homes built by field test partners expand the knowledge base and library of precedents for future student teams. Working with multiple partners also facilitates the testing and evaluation of scenarios in an expedited manner, allowing evaluations of outcomes to happen in a more timely manner. For example, in partnership with a Habitat for Humanity affiliate, two versions of the Buster's House prototype were completed: one built to meet Passive House (PHIUS) energy standards and the other to Zero Energy Ready Homes (ZERH); both homes were also built to FORTIFIED Home Gold standards for High Winds. These projects not only supplied quantitative data tabulating the costs of the beyond-code features but also provided valuable insights about the detailing and sequencing of the projects. Through documentation of the field test projects, future Rural Studio students have access to more precedents for building assemblies (Figure 11), budgetary information, and data on high-performance homes. Continued post-occupancy monitoring of these projects will also provide the Studio with confirmation of the efficacy of the designs.

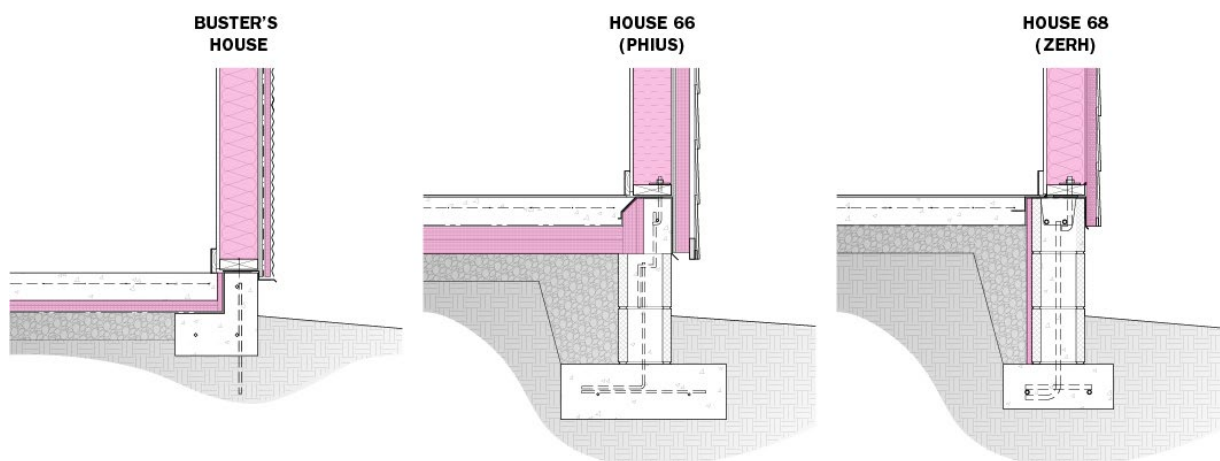


Figure 11: Foundation detail comparison between three versions of the same house prototype (Auburn University Rural Studio)

Rural Studio also benefits from a larger national perspective on housing affordability. The research of regional and national organizations helps contextualize what Rural Studio observes in its own local communities. It also exposes Rural Studio to some of the paths other communities are taking to address the challenges and barriers to equitable homeownership. This context has allowed Rural Studio to sharpen and reinforce its understanding of the places in which it works and to clarify the mission and value of its

projects. For example, Rural Studio's understanding of the unique value of homeownership in rural areas has been better articulated through contrast with urban settings. In urban places, the value of the home is typically derived from the value of the land on which it sits. Capital is extracted when the homeowner sells the home and gains from the appreciation of land value. In contrast, the value of rural lands is typically fairly stagnant and, therefore, the homeowner does not gain as much benefit from a reliable increase in land value. Instead, the asset is the home itself, through its ability to be passed down to descendants, building wealth over generations. Through this context, Rural Studio can advocate for the importance of creating quality, durable homes that are an asset for their owners for generations to come.

## 5. CONCLUSION

The integration of research gathered through the Front Porch Initiative into Rural Studio's student projects is ongoing, but the work has shown pedagogical advantages for undergraduate and graduate students to work together in collaboration with a larger research agenda. Both academic outcomes and research findings have benefited from the relationship. The applied, place-based research performed at Rural Studio contributes to the body of knowledge and research related to housing affordability and sustainable rural living. With rural America accounting for approximately 21 percent of the nation's population, rural housing is frequently overlooked in national conversations about the current housing affordability crisis (George et al. 2012, 11). However, the unique character of rural housing requires different approaches and responses, and Rural Studio's applied research in this field holds value outside of the outcomes it generates for its students and community members.

However, Rural Studio's primary mission is the education of architecture students, and all projects and research efforts must create opportunities for meaningful academic investigations appropriate to the year level and course of study. Rural Studio has been located in the same area of West Alabama since its establishment in 1993. The Studio is built around the importance of working in and learning from that specific place. When integrating inputs from other geographic, climatic, and cultural places, how do we ensure we remain focused on local communities?

The methods and benefits of collecting and disseminating products and data from Rural Studio's place-based research are apparent in the work of Front Porch Initiative. Yet methods of incorporating outside feedback into Rural Studio's coursework still require careful consideration. Influence from field test partners will enrich research efforts, but a strategy must be developed to make thoughtful adjustments that will not diminish the immersive nature of the work. As information sharing continues, Rural Studio will work with students to distinguish between the universal and the particular, continually sharpening the research questions.

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