Changing the Course Design to Include Habitat for Humanity Improved Course Outcomes and Broadened Student's Perceptions of Community Service

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Introduction

Architectural education often includes course(s) pertaining to the creation of architectural working drawings. Working drawings require the individual creating them to have knowledge of principles, conventions, standards, applications, and restrictions pertaining the manufacture and use of construction materials, components, and assemblies.[1] Working drawings are a vital component of the architect's ability to communicate the design to the construction team. In the initial phases of design, the owner often meets with the architect to discuss the intricacies of the design, and when the graphical representation is not completely conveying the design intent, the architect is able to verbally clarify and 'paint a picture' of the design for the client. However, the architect is typically not on the construction site every day to 'paint a picture' for the construction team. The architect does conduct and participate in construction phase start-up meetings, site visits, phone and/or email inquiries, and request for information (RFI) documents, but verbal communication between the contractor and the architect is limited. This means that the ability for the architect to communicate design graphically through architectural working drawings is one of the most important skills required to have an architect's design concept interrupted into constructed form.

Architectural Documentation I is typically taught during the sophomore year. The course teaches students design concepts and building codes for a residential, wood framed construction project. While design is an important component of the course, the true focus and goals of the course is to introduce students to the complexities of creating architectural working drawings, and specifically on the construction drawings portion of construction documents. Components of design meld with constructability, selection and sizing of materials, reducing material waste, efficient space design, and clearly illustrating the resulting design in a set of construction drawings. To achieve these course goals in a semester, the project size is kept small, allowing us to focus on quality instead of quantity.

Initial offerings of the course resulted is several issues that needed to be addressed. While students are most often very excited about the first phase of the course, 'designing' a home, keeping the individual projects small in size and scope became quite difficult. Students were intrinsically motivated to design their 'dream home', intent on solving all the preceived problems of their childhood home(s). While student enthusiasm and motivation to attack an architectural design problem is always welcomed and enjoyed in the classroom, the 'design creep', and resulting increase in square footage for preceived 'dream homes' reduced student concerns for efficient space design. They essentially added more space in a room to 'solve', in their minds, functionality problems. This trend can be witnessed in our american larger suburbian homes, and is discussed in Sarah Susanka's book, *The Not So Big House: A Blueprint for the Way We Really Live*. Making spaces larger is often trading quality and functionality for a space that is oversized and laking the intamacy integral to the to the concept of 'home'. While reorienting student perceptions of quality home space design is important, it is not the primary

focus of the course and would require much more time to be invested in teaching these concepts. It is also important to note that these concepts are covered in other courses withing the program.

The resulting issue of increased square footage and the design complexity of the 'dream homes' designed by the students became more apparent during the second phase of the course, construction drawings. As with any design, the larger and more complex the project, the longer it takes to produce a quality set of construction drawings. In addition to the increase in time, students also encountered situations that required a much more creative technique in documenting the design. This was a rather large issue, because this course is the student's first exposure to the standard techniques of documentation. To adequately cover the additional, specialized techniques of documenting individual student situations that occurred in their designs through plan, elevation and section, detailing constructability and reducing material waste portions of the course suffered.

While the students did not understand that the quality of their work suffered because of the issues that occurred, as an evaluator of the student work and a professional in the industry, it was apparent that the complexity and quality of the construction drawings did not match the complexity of the designs produced by the students. The student's construction drawings lacked the ability to communicate the design intent to a construction team. To combat the 'design creep,' the following semester imposed strict and enforced square footage and design limitations on the student's individual designs. Even though the rational of the square footage limitation was explained to the students, and they realized and understood the limitations during the second phase of the course, motivation and enthusiasm as a whole was diminished. All of the components of the course were covered and implemented in the student designs, and the production quality and understanding of the standards for producing construction drawings were improved from the previous semester. But a solution needed to be found to regain high motivation and enthusiasm for the course, for when they are diminished, so is the resulting quality of the student work.

Literature Review

To find a solution that would overcome all the issues encountered, and increase the motivation, excitement, and enthusiasm for the course, a study of traditional architectural education techniques began. A particular statement increased personal motivation to nullify its validity or allow it to be experienced in our program. The statement came from Stirling Howieson, "Architects are typically seen to be trained as individualistic prima donnas, systematically subjected to the capricious and pseudo-intellectual vagaries of fashion – often referred to as 'style'" [2].

As currently being taught, the course followed many aspects and traditions found in the traditional design studio environment. "Traditional design studios are too often insulated from ordinary, everyday life of the community in which a project may be located, or often, hypothetically located. Topics of investigation are artificially controlled; promoting theory in a laboratory environment where design methodology is contained and success is often guaranteed" [3]. By allowing students to design their 'dream homes', they were able to design inside a prescribed envelope, devoid of any knowledge of the community where they would be placing

their 'dream home', focused on design techniques and controlled documentation procedures, and as long as students produced quality work, they were going to be successful.

This separation of community from the process of design prompted an investigation into service learning and civic engagement. "The consequences of excessive individualism of today's cultural climate include a growing sense that Americans are not responsible for or accountable to each other; a decline in civility, mutual respect, and tolerance; and the pre-eminence of self-interest and individual preference over concern for the common good. Goals of personal advancement and gratification too often take precedence over social, moral, or spiritual meaning." [4] The concept and actions of the student designing their personal 'dream home' focused them on expressing their individual desires of prestige and success which was often manifested in the design of an ostentatious home with no regard for engaging the community in which they placed the home. Samuel Mockbee was quoted from a conference held at Princeton University to say, "The practice of architecture… also requires active civic engagement. It is in our own self-interest to assert our ethical values and our talents as citizen architects." [5] The project in its current state was clearly disengaging students from reality, culture, and the true richness of designing to exist and engage within a project's community. The students needed to be taught the ethical values and influence they can have on the human experience within our communities.

The search for new approaches to the design studio is being seen throughout the design disciplines; one example of an innovative educational practice is the concept of incorporating 'live projects'[6]. Experiential education puts students in the field, addressing real, complex and open-ended projects. Fieldwork is integrated with the academic content and students have a context in which to apply practical, theoretical, and ethical solutions to problems or projects.[4] "Live projects reject the separation between real and theoretical, practice and education, and allow the student to be creative within constraints." [7] Sara defines 'live projects' as:

> "The live project is defined here as a type of design project that is distinct from a typical studio project in its engagement of real clients or users, in real-time settings. Students are taken out of the studio setting, and repositioned in the 'real-world'. This external involvement tends to result in students producing something that is of value to the client/user group, which might range from ideas, feasibility reports, or research, to a completed design scheme, a construction or other intervention. The project is typically worked out in collaboration with the external collaborators, rather than being imposed by the design studio tutor (in fact the tutor is often very much a part of the team). As a result, the process is more dialogic and inclusive than traditional studio projects, allowing and embracing alternative voices in the studio environment." [6]

With the incorporation of a service-learning project, a 'live project' studio would provide the connection to community, civic engagement, and connections to the reality of architectural practice.

Habitat for Humanity

Having personal connections and volunteer experiences with Habitat for Humanity, investigation into the melding of the academic goals and outcomes of the course with the goals and mission of Habitat for Humanity began quite naturally and instinctively.

Habitat for Humanity International strictly governs and regulates the design of the homes they construct in their *U.S. Sustainable Construction Standards* guidebook. For instance, a three bedroom, one bathroom house is limited to 1,070 square feet, but may include an additional half-bath. They also strictly govern circulation throughout the home, requiring corridors to be a minimum of three feet, four inch wide from rough frame to rough frame, and all human passage doors, including the bathroom door, are to be at least three feet wide. [8] Providing and requiring house designs adhere to the design guidelines supports Habitat for Humanity International's mission, "to build simple, decent, affordable houses in partnership with families in need of shelter. [9] Strict adherence to the guidelines is required to ensure designs do not experience scope and cost 'creep', and to promote equality between the homes being constructed for families across the country.

Groups of concerned citizens wanting to address the problem of poverty housing in their community can form a Habitat for Humanity affiliate. The affiliate level Habitat for Humanity office will serve that specific area in partnership with and on behalf of Habitat for Humanity International. [10] While Habitat for Humanity International provides an extensive design guidebook, sample house plans are quite limited in quantity and do not always respond to local community culture and specific family needs. Unfortunately, most Habitat for Humanity affiliates have no other source of design advice or support beyond Habitat for Humanity International. [11] Given the affiliates responsibilities of fund raising, acquiring land, selecting and nurturing families, recruiting volunteers, constructing homes, and much more, home design dialog can get lost and often be seen as a luxury. [12] In fact, many low-income housing nonprofits do not include creating quality designs as part of their mission. [13] Home design expertise is clearly an area where low-income housing nonprofits could use volunteer assistance from experts, or potentially, experts in training. "The challenge has been, and will likely continue to be, to get architects and nonprofit builders to talk the same language: simple, decent, and easy-to-construct housing." [12]

The American Institute of Architects reports that only six percent of its member firms report involvement in the affordable single-family homes market sector. [14] Sara Susank's expresses her philosophy on home design as:

> "It's time for a different kind of house. A house that is more than square footage; a house that is Not So Big, where each room is used every day. A house with a floor plan inspired by our informal lifestyle instead of the way our grandparents lived. A house for the future that embraces a few well-worn concepts from the past. A house that expresses our values and our personalities." [15]

Susank's approach to smaller, quality, thoughtful design practices in home design does not always lead to reduction in construction costs, but rather a reallocation of funds spent on the details and quality of materials rather than the sheer volume of space. [15] Indirectly, Susank's approach will assist in developing quality home designs for low-income families, and Habitat for Humanity. The use of quality materials will not be able to be utilized, but the concepts of quality and meaningful space designed for the way we live and use our homes is a perfect philosophy to embrace in this course.

This critical need for low-income, affordable housing design skills is apparent, and the Architectural Science program in the Department of Architectural & Manufacturing Sciences at Western Kentucky University has two licensed U.S. Architects, an internationally licensed

Architect, a Ph.D. in Architectural Technologies, and over 150 students at various stages of development in their architectural education. The emerging relationship is natural, healthy, productive, and nurturing for both entities. In particular, becoming involved with the local Habitat for Humanity affiliate supports the university mission and quality enhancement program that promotes applying knowledge and training to address relevant issues in our communities or society; demonstrate respect for diversity of peoples, ideas, and cultures; and to seek opportunities to contribute as responsible citizens living and working in a global society. "It is important for students to develop a sense of being members of various communities, to understand the responsibilities entailed in community membership, and to have both the inclination and capacity to contribute in important ways to those communities." [4]

Often students do not realize the embodied knowledge and skills they possess; nor do they understand the value of those skills to their communities and how or where to apply those skills outside the realm of employment. Once students are made aware of specific contributions they alone can make to various communities in need, most often, the students are eager to do so. As stated by Hinson and Miller, "in every academic collaboration case they studied, the affiliate leaders cited the energy, enthusiasm, and commitment of the students they worked with as one of the most positive and satisfying aspects of the partnership." [11].

"As much of the architectural media still holds the traditional view that design is a high-value servant of the wealthy and powerful…"[15], through the collaboration between the local Habitat for Humanity affiliate and the architectural students in the Architectural Documentation I course, those perceptions should begin to change. The richness of the experience and resulting product and relationships should also begin to alleviate the prior statements and expressions made by Stirling Howieson.

The Project

Architectural Documentation I, as stated previously, focusses on teaching students how to create construction drawings for a house design they created and developed. Using Habitat for Humanity International's *U.S. Sustainable Construction Standards* guidebook restricted the students to a rigid size and scope for their projects. Habitat for Humanity International's web site also provided data, personal stories, imagery, and a connection to the tremendous need for affordable housing and the mission of Habitat for Humanity International. This combined with the selected philosophies of Sarah Susanka, the students were able to embrace the design challenge with more motivation and drive than ever before. Students embraced the idea that they could make an impactful, meaningful contribution that a family living in poverty would feel and live within every day.

Teaching two sections of Architectural Documentation I provided 28 different home designs for Habitat for Humanity affiliates; see student designed example floor plans in figures 1, 2, and 3. "The more designs available to Habitat, the easier it will be to involve the homeowners in this important decision that will shape their lives." [12] Because Habitat for Humanity affiliates limit contact with the families that will be occupying the homes during the initial phases of family selection and floor plan layout, students were asked to design homes for their hometown Habitat for Humanity affiliates, the local affiliate in the surrounding community of the university, or they could choose an affiliate they felt could benefit from their contributions. This gave the student a

sense of connection with the community, town, and often the specific location where the home would be placed. The sense of pride in their contributions and the use of the strict guidelines of Habitat for Humanity International resolved all of the issues that had been present in the previous semesters of teaching the course.
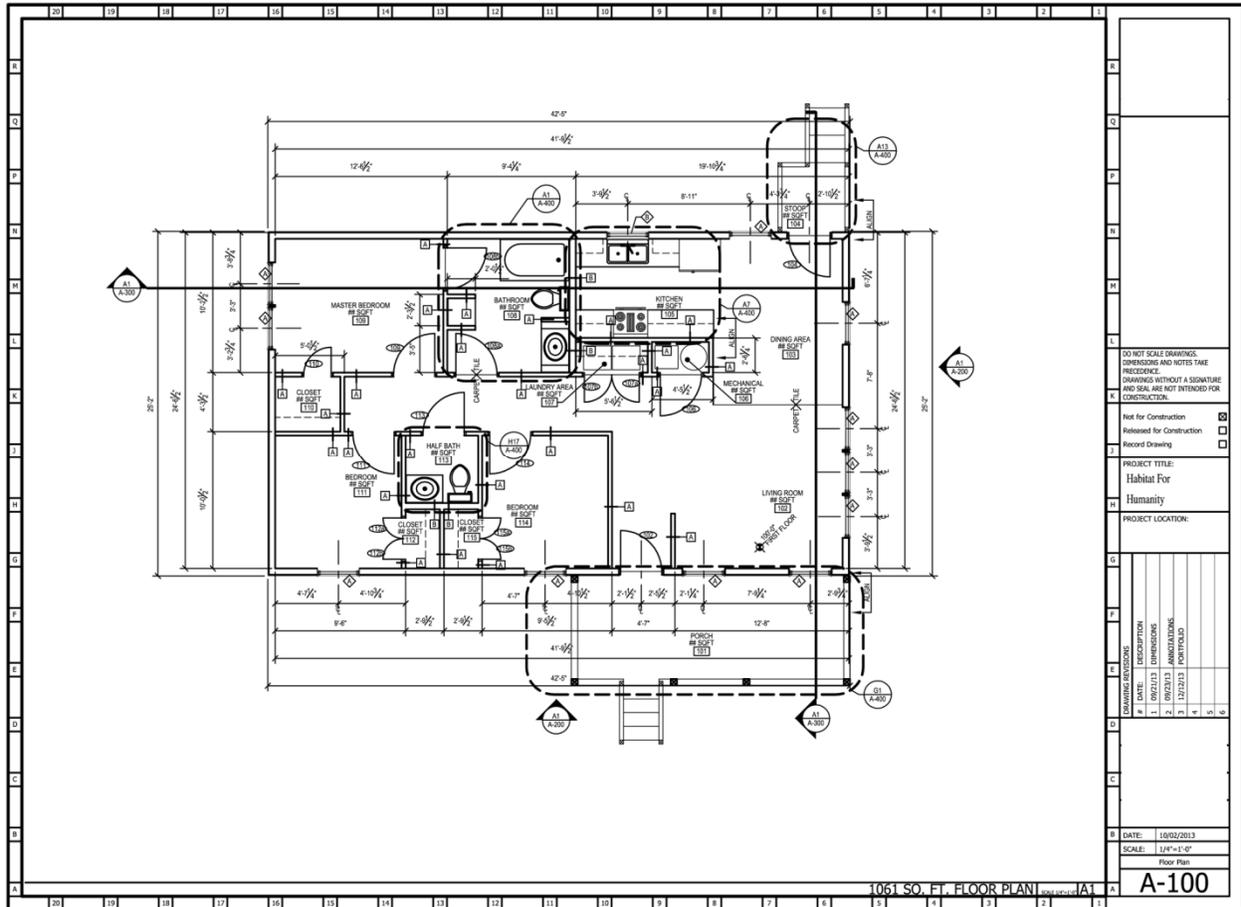
Figure 1: Student Floor Plan Design

The strict rules of construction materials did provide for some contemplation and controversy. Scott Wing posed the question: "To what degree should the mission of an architectural education conform to the mission of a nonprofit building partner (Habitat)?" Which ultimately lead Professor Wing's decision to increase Habitat's standard wall construction to two-by-six walls, with energy-conserving detailing and cellulose insulation throughout the house. [17] After finding support in my decision to deviate from the strict guidelines in my literature review, we too changed the construction of the exterior walls to two-by-six construction for the very same reasons, all of which was explained to the students.
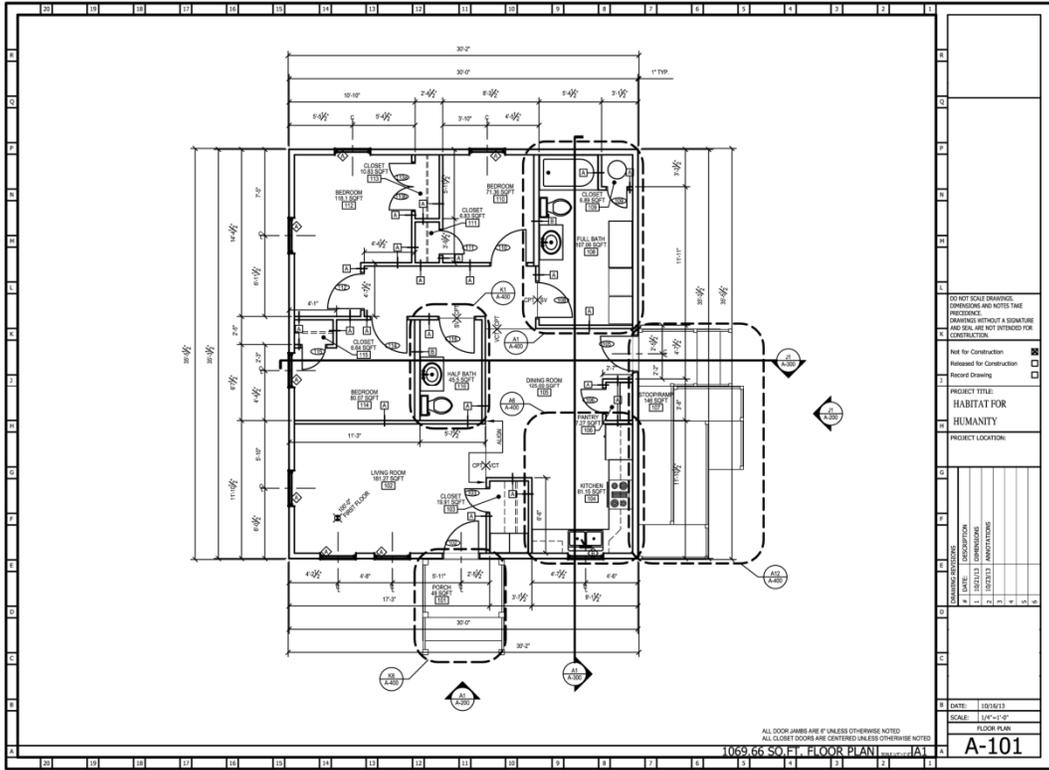
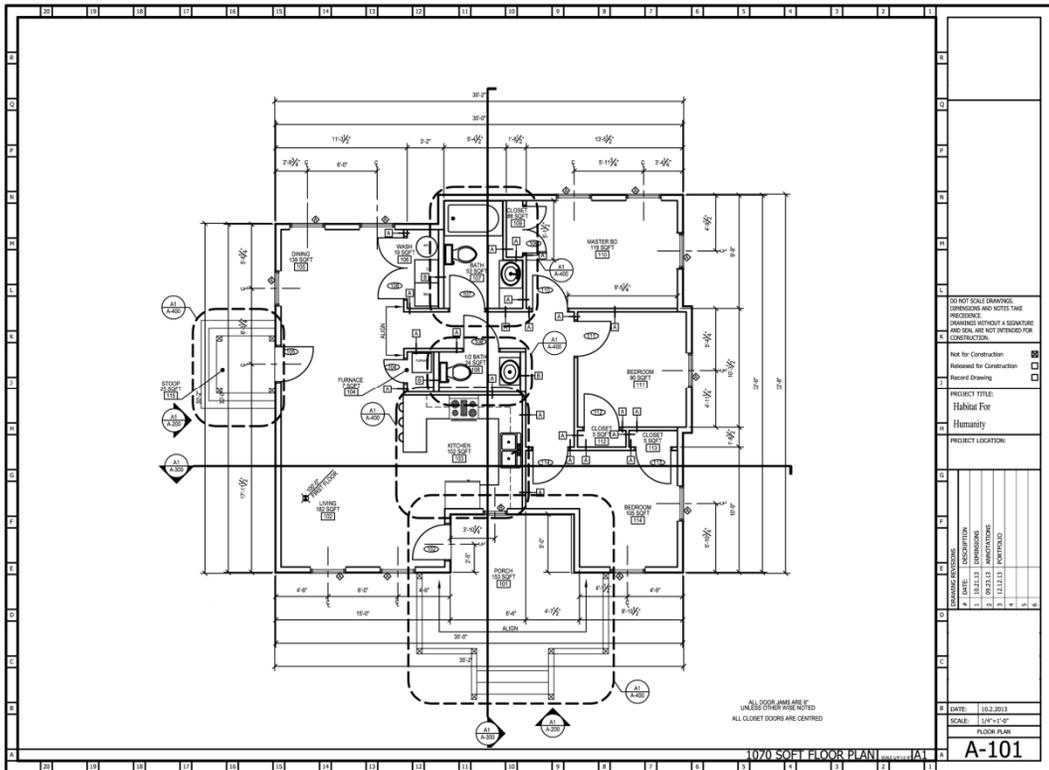**Figure 2: Student Floor Plan Design**

Figure 3: Student Floor Plan Design

Students designed using plan, elevation, and section of their individual homes. Those drawings were then used as external references in the creation of the construction drawings. A standard architectural drawing set is organized as: A-100 Floor Plan, A-200 Elevation, A-300 Building Section, A-400 Enlargements, A-500 Details, A-600 Schedules and Diagrams, A-700-800 User Defined, and A-900 3D drawings, isometric, perspective, and/or photos.[18] Advanced AutoCAD techniques of externally referencing drawings, dimensioning and printing various scales, managing layers, drawing organization through filing, file naming and layer naming are a few examples of the professional practice content areas implemented in the course. The floor plan was externally referenced into two sheets, A-100 and A-400, allowing the students to produce enlargements of difficult to annotate areas of their floor plans. The elevations were externally referenced into two sheets, A-200, and their cover sheet. The building sections were the most challenging and created in such detail that it could be used in more sheets than any other drawing. The building section was used in A-300, A-400, and A-500. A-300 was the building section, which was mapped to enlargements of cabinetry layouts on sheet A-400, and also mapped into sheet A-500 illustrating the details and constructability of their designs. All sheets were annotated, including dimensioning, key noting, and mapping symbols; see an example of student designed and annotated construction drawing set in figure 4.

As with any project, design never truly stops until the project is dropped by the client, construction completed, or the semester ends. The students in the course were no exception to this factor of design. Students continually made improvements to their design throughout the documentation process; always updating each sheet that was affected by the change or modification. The realization that their projects could indeed be constructed and utilized by a family in need for as long as they lived within its walls proved to be highly motivational for the students to produce their very best work.
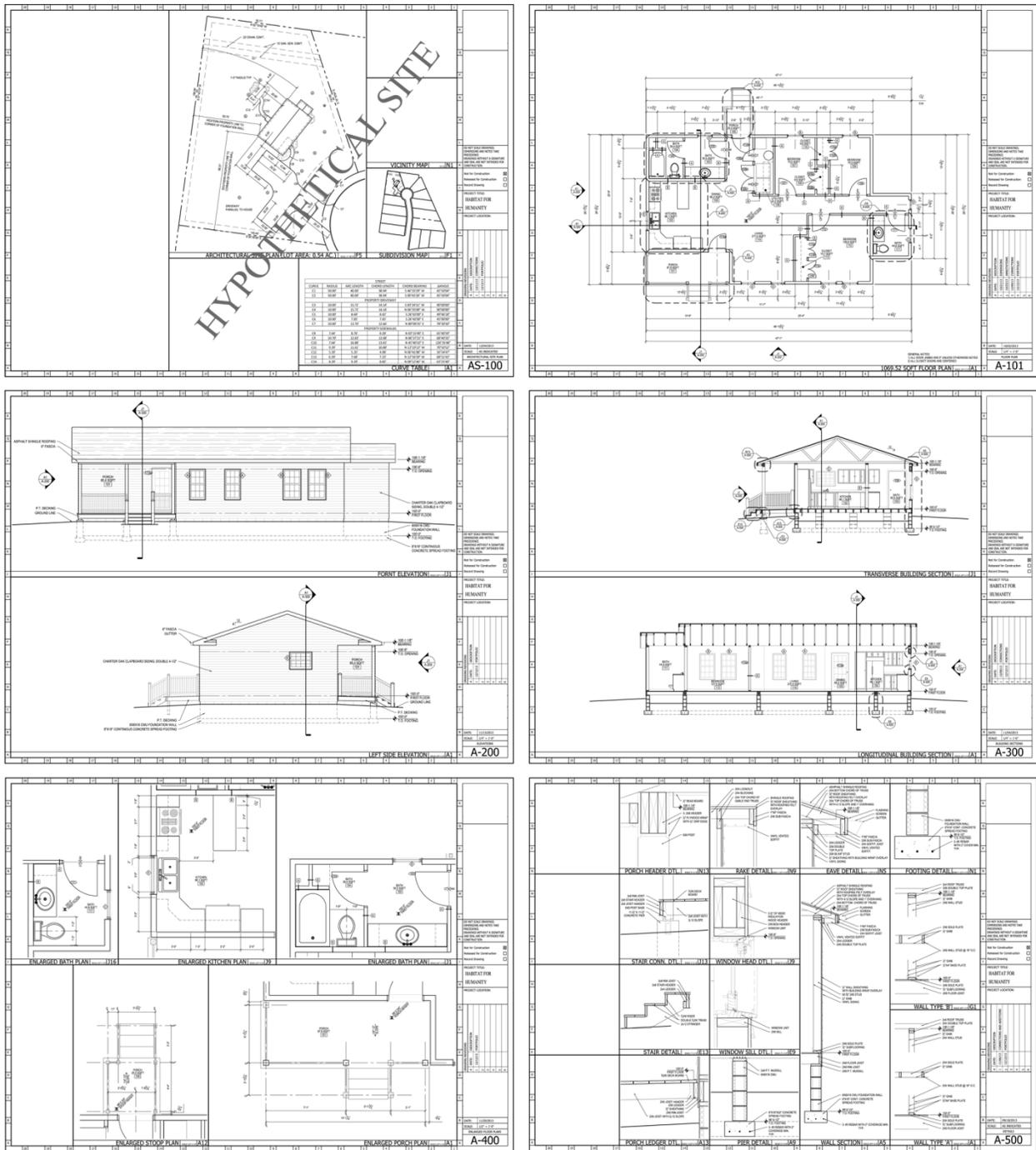
Figure 4: Student Designed and Annotated Construction Drawing Set

Conclusion

Many other architectural programs around the country are also working with Habitat for Humanity. Some of these architectural programs are discussed in *Designed for Habitat: Collaborations with Habitat for Humanity* by Hinson and Miller: Auburn University School of Architecture, University of Arkansas Community Design Center, Louisiana State University

School of Architecture, Louisiana Tech University School of Architecture, and University of Virginia School of Architecture. [11] However, these schools are including the construction of the house as part of the curriculum. For Architectural Documentation I at Western Kentucky University, including the construction would go beyond the academic goals and outcomes of the course. The primary focus of the course is creating construction drawings. But this does not mean that the students learning and participation with a Habitat for Humanity affiliate must end. In fact, the students are encouraged to follow up with their affiliate and determine if they can assist with modifications or changes to the home designs they created. If their home design is chosen to be constructed, the student has the opportunity to volunteer to work on the construction of the home they designed. This model has an added benefit. The students are not required to continue a civic engagement relationship with the affiliate. The students intrinsically want to continue that relationship for their own personal reasons, not for the grade. This simple act is instilling a since of community involvement and civically minded architectural contributors to society.

The 'live' project studio approach has proven to be beneficial for all parties involved, and particularly for our students. To continue to develop the richness of the course, future offerings of the course would include direct contact with the local Habitat for Humanity affiliate, the selected family, and the site where the house would be constructed. This interaction between the students and a 'real' client increases the professional practice content of the course to include: client interaction skills, interviewing, and presentation skills. Direct access to the site would allow for the student designs to relate directly to the community surrounding their home; utilizing contextual and environmental clues to improve the quality and relevance of the student's designs. Perceptions of architectural education and architectural students would also improve through the interaction between the students, faculty, and the community. The community would witness and benefit from the talents, skills, expertise, and enthusiasm the students have to offer the community.

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