

West End Project – A “Hard Hats” Service Learning Class

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When society is too concerned with meeting an individual's need, service-learning projects provide an opportunity of integrating community service with hands-on activities for students. Faculty members are allowed to integrate teaching / learning objectives with real community needs. Classroom environments may not allow students to experience significant hands-on construction activities, and consequently not appreciate the activity as a learning event. Even if students are working in the construction field while attending classes, their level of experience may limit their technical learning. Taking into consideration this apparent disconnect in teaching / learning, a service-learning construction class was created. This paper discusses the development and implementation of the class for a residential renovation project, and examines the outcomes expressed by participants of the class.

Keywords: Service-learning, Community service, Experiential learning, Hard Hats

Introduction

Why incorporate service-learning into a construction management class? In a society that is too often concerned only with meeting an individual's need, service-learning provides a process of integrating community service with hands-on activities for students to enrich their learning experiences (Padrón, 2000). Faculty members are provided with an opportunity to explore learning objectives that run outside the mainstream of typical construction management curricula. The activity allows an integration of teaching / learning objectives with community needs.

Students spend many hours in classrooms and labs that are too often disjointed from the accumulated knowledge of the total tasks of a building project. Classroom graphics and instructions show students how to frame a wall or form a footing, but those activities become isolated actions that students may or may not appreciate as being learning building blocks. Students may work for construction companies while in school, but may not have the opportunity to experience hands-on construction activities. Instruction in the classroom may teach estimating, scheduling, and planning, but these procedures are geared to the management characteristics of construction. They do not necessarily provide the opportunity to construct building components that students analyze from construction drawings.

This disconnect between learning labs and hands-on construction led to the creation of the “Hard Hats” service-learning community engagement class. The class allowed students to experience the realities of renovation construction in concert with community interaction and thus grow through the service option.

“Hard Hats” Project Development

The West End of Greenville, NC has long been a depressed business and residential area of the city. In mid 2005, the City of Greenville undertook the task of area revitalization in this community, and through a referendum vote of the citizens, Block Grants became available. During the Fall 2005 a group of interested faculty members in East Carolina University's College of Technology and Computer Science (Construction Management) and the College of Human Ecology (Interior Design and Merchandising), and Pitt Community College (Construction Technology) met to create the “Hard Hats Interest Group” to determine areas of need that as a group could provide assistance to the City.

Over the course of the semester a variety of talking points were developed for discussion purposes with Community Development Department divisions of City Planning and Urban Development Division, and the Office of the Mayor. Key talking points included 1) design and construction of new in-fill residential construction, 2) design and renovation of existing residential buildings, 3) neighborhood site planning and landscaping, and 4) general building maintenance.

The mission of the Community Development Department states “The City of Greenville is a hub of commerce, health services, education, and culture for Eastern North Carolina. As a city, we understand that in the new economy regions are vulnerable without diverse, dynamic, and livable centers. The City's preservation and redevelopment initiatives compliment public-private initiatives led by East Carolina University, regional economic development partners, and local business leaders to upgrade infrastructure; to attract dynamic business firms to Greenville and surrounding areas; and to train and retain the region's high-quality workforce.” (City of Greenville)

Because of the City of Greenville desired to reinvigorate the East End Neighborhood, it was possible to develop a working arrangement for a service-learning project. During discussions with the City Planning Department, it became apparent that an opportunity to assist in the revitalization was possible. A two-fold design and construction project was envisioned and developed. A three building segment of residences was selected for renovation by the city (See Fig. 1). Based on the Block Grant funding model developed by the City, each of these homes would be completely renovated at a cost no greater than \$40,000. Upon completion each home would be sold to residents of the neighborhood at that cost. Based on the residential housing market study, the \$40,000 amount was in the mid to high end range for the neighborhood. Consequently, renovation costs would limit the scope of work to the absolute necessities with little room for innovative materials or designs.



Fig. 1 - Renovation Buildings

In negotiations with the City, a Work Breakdown was established between the Hard Hats group and the City's General Contractor, Chance and Smith Contractor. Because of liability issues imposed by East Carolina University Risk Management, as well as the experience level of the Hard Hats participants, certain activities were eliminated from the Scope of Work. The final Work Breakdown included building demolition, new rear addition (foundation, floor framing, wall framing, and roof framing), new interior partitions and existing partition renovations, new crawl space insulation, new wall insulation, new drywall walls and ceilings, and new vinyl siding. The General Contractor was responsible for new replacement windows, a new metal roof, new mechanical, electrical, and plumbing systems, and masonry in-fill work on the foundation.

The Project

During the Spring 2006 semester, eleven students in the Department of Construction Management, under the direction of author, became the "Hard Hats" Construction Team as an Independent 3CH lab/class. This class placed students in an environment that none had first hand knowledge. They were asked to become ambassadors to the community while they worked on the project.

This class was not considered community service, volunteering or an internship, but a service learning project. The National Community Service Trust Act of 1993 defines service learning as "a method under which students learn and develop through active participation in thoughtfully organized service experiences that meet actual community needs, that are integrated into the student's academic curriculum or provide structured time for reflection, and that enhance what is taught in school by extending student learning beyond the classroom and into the

community.”(Rhoads & Howard, 1998) The course was created to equally benefit both the provider (student) and the recipient (residents of the community).

The first activity required students to measure the existing residence and to create a dimensioned as-built AutoCAD drawing. Based on that documentation, the author, a registered architect, was responsible for the final project design. (See Fig. 2)

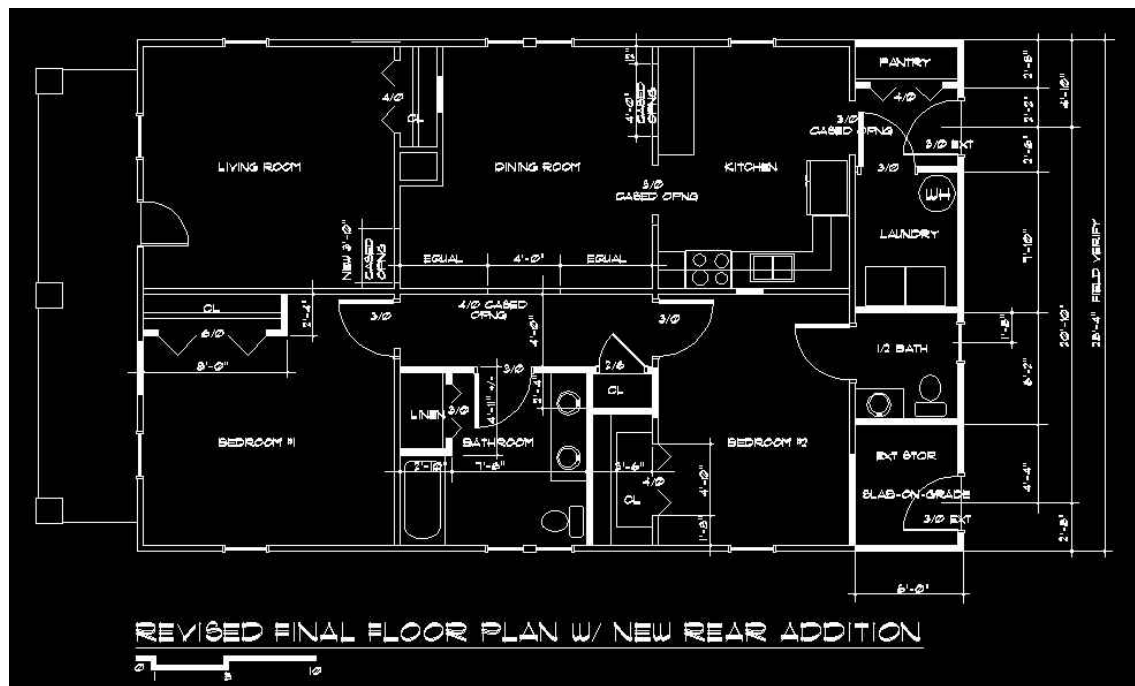


Fig. 2 - Revised Final Floor Plan w/ New Rear Addition

Before any work could begin on the project residence, students were assigned project tasks that would become a part of the activities for the semester. Since the class membership was composed primarily of seven sophomore students whose construction experience was limited, it became evident that basic construction skills and activities would have to be developed. The remaining four upper class students had sufficient construction experience and skills in residential construction. Two of these students were selected as foremen for the project.

Tasks assigned for research and creation of step-by-step installation methods included insulation installation, vinyl siding installation, and drywall installation and finishing. In addition, quantity take-offs and Purchase Orders were required for all wood framing, sheathing, vinyl siding, insulation, and drywall. Students were required to present their findings in class presentations followed by lengthy Q&A sessions. Analysis of quantity take-offs were undertaken by the author in conjunction with the responsible student(s) to verify calculations were correctly determined. From those discussions students prepared Purchase Orders with the City approved agencies.

As in any renovation project, discoveries took place during the demolition of interior plaster with wood lath walls and ceilings. Although the residence was currently termite free, numerous locations of previous infestation became visible. Students learned that 60+ year old lumber is not as dimensionally consistent as today. Students had been fed with the rumor that all construction in the past is better than constructed today. How soon they found out that is not necessarily true!

In addition, students learned real examples of why wall and trim flashing is an important component of a wall system. All these conditions required reconstruction of wall systems. They also discovered that lumber sizes have changed over the years and new infill construction has to be adapted to the dimensional differences. (See Fig. 3)

During demolition one major change to the Scope of Work took place. Initially the rear enclosed porch (See Fig. 4) was to be retained as part of the reconstruction. However the existing conditions, as well as the interior headroom, required that the porch addition be removed. (See Fig. 5) This necessity led to additional construction of a new rear addition. The additional work substantially changed our construction schedule.



Fig. 3 - In-fill Wall Framing

New footings were dug and poured, new CMU foundation walls laid, and new floor, wall, and roof framing were added to our activities. These changes took place during a rainy period of the season, causing some delay on particular workdays. (See Fig. 6)



Fig. 4 - Existing Rear Porch



Fig. 5 - Rear Porch Demolition



Fig. 6 - Completed Rear Addition

Because the class construction time was limited to two 3 HR labs per week and on available Saturdays, our initial building schedule and associated activities soon became obsolete. However the students took every change and setback as a learning experience. They became acutely aware of coordination between trades. An example that did cause some discontent was during the placement of crawl space insulation placement. The general Contractor, Chance & Smith, had informed the Instructor that electrical, plumbing, and HVAC inspections had taken place and that the team members were approved to install insulation. After a long day of insulation placement (no two joist spaces were of consistent width), the team members were informed by the Electrical Inspector that it was necessary to remove all perimeter insulation in order to verify wiring penetrations to the main floor. Once the three students responsible for the insulation installation released their frustration, the insulation was removed in a timely fashion, and the inspection was completed. It took much cajoling by the instructor to get the students back under the space to complete the re-installation of the insulation.

The twelve weeks of construction and over 875 hours of student involvement (See Fig. 7) went by too fast. The team discovered that with the additional rear construction, it was not possible to complete the full scope of work initially intended. However, the City, understanding the scope changes, negotiated the completion of the project with the General Contractor. The work is currently ongoing with this building. By December 2006 the residence will be completed for occupancy. (See Fig. 8)



Fig. 7 - Final Day of Hard Hats



Fig. 8 – 95% Completed Residence

Reflections on the Project

The service learning course was successful by impressing upon our students valuable lessons concerning our societal and economic differences. On many occasions students were stunned that the finish materials used were so basic, and why better materials were not used. It was necessary to reiterate to the students our building budget, and a reminder that the “small house” would be considered a “mansion” by the population of the neighborhood. In visits with

neighbors, the students were reminded that the two bedrooms, 1300 GSF residence would easily provide luxurious living space for most of the residents. These observations were indicative of the real reasons for the service learning course. In discussions with neighborhood residents, students realized that this house was a treasure in the desert of homes of the area. The participants were excited to help the people that were not asking for a free ride but were working to purchase this house.

Students learned to work effectively as a team, relying on each other for task training and subsequent activities. They were able to learn new trades, such as drywall hanging and finishing, roof framing, and trim work. All students were given responsibility to take lead roles for particular activities, based on their initial class assignment. The student responsible for drywall installation, even though having no previous experience, became the leader. As such, the individual sought out assistance or listened to other students and the instructor concerning better methods of installation. As always, the instructor was watching all activities to insure that installation was per the building code and accomplished in the best quality. Students were also self-regulating, many times informing their classmates that the work was unacceptable and needed to be redone.

Because most of the students had limited field experience, they found this “the class that taught them the most about residential construction”, “a class that finally integrated the text and reality”, “students learned leadership skills while others learned useful work skills”, and “I think it was one of the best classes that a construction management student could take, I learned so much from the experience”. All former students desire this class to be taught as an on-going service-learning class and would gladly take the class again. Student comments show that easily 20+ students are ready to sign-up.

Issues that the instructor felt needed correcting are 1) a hands-on class at the beginning of the semester to provide instruction on methods and techniques of construction and the use of hand tools and power tools, 2) a weekly wrap-up meeting with all students to discuss the progress of the project, solutions to problems that had occurred, and directions for the upcoming week, 3) carefully delineate the Scope of Work based on the work experience of the students, and 4) attempt to make the class meeting a minimum of 3 days per week 3 hours per day, in order to maintain the “head of steam” associated with the project construction. Only meeting twice a week severely compromised the ability to complete tasks in a timely fashion.

Currently the author is actively working with the City Planning Department to develop year-long projects for such a class. A semester was deemed too short of duration to provide the service-learning experience. Students remain enthusiast in developing a future class such as this one; they are anxious to participate.

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