

Rehab In A Day: A Service Learning Project

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The best way for a student to learn a skill is with hands-on experience. Construction management students can attain this knowledge through volunteer building projects for the local community. A professor decided to undertake a large residential rehabilitation project for a national non-profit charity organization. This volunteer project had all the characteristics of a real construction project, and had to be completed in one day. In order for this project to also serve as a learning tool for construction management students, they were assigned specific duties as if they were operating a construction company. The success of the project hinged upon the level of planning that the students perform before the big event day.

Key Words: Scheduling, Estimating, Site Logistics, Staging, Labor, Materials, Service Learning

Introduction

Imagine the television show *Extreme Makeover: Home Edition* (ABC) and you can picture the premise for this service learning project. Rebuilding Together, also known as “Christmas in April,” is a non-profit organization that has been rehabilitating homes for low income, elderly, and disabled people for the past thirty-four years. The program began in 1973 in Midland, Texas with neighbors helping neighbors in an old fashioned “barn raising effort” (Rebuilding Together, 2006). The materials for these projects are either donated or funds are raised through local business owners. Labor for these projects is solely volunteer.

Program Background

Rebuilding Together was officially founded in 1983 in Washington D.C. as a nationwide organization with the rehabilitation projects occurring simultaneously through the nation on the last Saturday of every April, hence “Christmas in April” (Rebuilding Together, 2006). Each local chapter of Rebuilding Together is responsible for designating a low income area of the city to be labeled as the “Dream Neighborhood.” Within this neighborhood, applications are distributed to the homeowners to determine the level of need. A committee evaluates all the applicants to determine which people are in the most need of assistance, based on low income, age, and/or disabled statuses. Based on available funds and resources, the organization’s goal is to rehabilitate fifteen to twenty homes every April within each “Dream Neighborhood.”

Each of the homes selected for the program becomes an individual project. A single individual with construction experience is given the full responsibility of completing the project on time and on budget. This person is designated as the “house captain.” The house captain must meet with the homeowners to define the scope of work that can be completed under the \$2500 budget and within the one-day scheduled timeframe. The biggest challenge faced by the house captain

is the unknown labor force. The type and amount of skilled labor is not known until the volunteers arrive on the jobsite that last Saturday in April.

Transition into a Student Activity

The involvement of the construction management students at the university began many years ago at a minimal level of participation. Historically, a group of students and one or two professors would apply to volunteer their services on the actual day of the event. The assignment of these students was determined based on the labor forces needed at any one of the fifteen homes being rehabilitated. While the efforts of these volunteers were greatly appreciated by the organization, the students did not apply any of the construction management skills they were learning at the university. The most successful home rehabilitations were performed by groups of volunteers built upon the labor and management forces of local construction companies. These organized teams became the basis for building a group of construction students to perform similarly today.

Preliminary Research (April 2005 Project): One of the professors at the university decided to serve as house captain for one of the fifteen homes. The volunteers for this home were pulled solely from a pool of students in the construction management and the civil engineering programs at the university. Because this project's labor force was composed completely of students; it became known as the university's "community service project." The house captain performed the entire project pre-planning including the scope of work, estimate, schedule, site logistics, material purchase and delivery, construction tools procurement, management of the labor force, and final punch-list items after the event. The planning experience of the house captain affects the success of these projects directly. For example, some of the work must occur days prior to the actual event, because certain tasks cannot physically be completed on the same day. A concrete foundation cannot be installed the same day as the wall it supports. The house captain continued to work after the event, to complete the final punch-list items and the thank you letters that are sent to all volunteers who performed the work and to the companies that donated materials. At the end of the project, the professor felt that the time allocated by Rebuilding Together for coordination and training meetings should be shared by more than one person. Based on this experience, the professor recruited students to assist with the preplanning process earlier in the project for the subsequent year.

Implementation (April 2006 Project): The professor again served as house captain, but with a renewed plan for a successful project completion. He recruited four senior construction management students, all with various levels of construction experience. One of the students was designated as the volunteer coordinator, responsible for recruiting the labor force and providing food and drinks on the day of the event. The remaining three students served as project superintendents, working under the supervision of the professor, house captain. These project superintendents divided the work equally based on their areas of expertise. Each project superintendent was responsible for all the pre-planning and performance of the tasks they chose to manage. Based on the extent of completion, the cost, the work schedule, and a well organized project team sharing the responsibility for management, the student's efforts resulted in the most successful rehabilitation project performed for the Rebuilding Together organization.

Method

Nuts & Bolts of the April 2006 Service Learning Project:

Terminology

The professor shall hereafter be referred to as **house captain**, the student management staff as **project superintendent #1, #2, and #3** and **volunteer coordinator**. The management group, which includes the house captain, project superintendents and volunteer coordinator, shall hereafter be referred to as the **project team**. The volunteers for the project shall hereafter be referred to as either **skilled labor** or **unskilled labor**. The owners for the home being rehabilitated shall hereafter be referred to as **owner**.

Project Planning Stage

Initial Strategy: The strategy of the house captain for the project was to “divide and conquer” the management responsibilities. The project team began the pre-planning stage of the project three months before the day of the event by meeting with the Rebuilding Together organization. The house captain received an official handbook specific to the proposed work. The handbook included owner contact information, project location, initial scope of work referred to as “owner’s wish list,” list of available supplies and equipment from the Rebuilding Together warehouse, budget and finance information, safety manual, and a homeowner’s waiver form.

Owner Meeting: The project team scheduled its second meeting of the pre-planning stage with the owner at the project site. The purpose of this meeting was to meet the owner and to determine the extent of the work owner’s wish list. During this initial visit, the project team members decided that they would view all the owner’s wish list items with equal importance until an actual scope of work could be well defined. The project team took pictures of the project, sketched preliminary project drawings as required, and made necessary measurements to be used for estimating purposes.

Scope of Work: Following this owner’s meeting, the project team met to define the scope of work for the project. In terms of project costs, the project team evaluated the available funds for purchasing the materials and their ability to secure adequate donations from local suppliers. Based on the house captain’s previous experience, the unskilled labor force could be adequately fulfilled by a large pool of volunteers to perform simpler tasks such as painting, moving furniture, and project clean-up. The availability of skilled labor played a role in deciding which tasks on the owner’s wish list could be completed in a timely matter during the one-day event. The last issue that the project team considered was a reasonable project schedule in terms of labor force and order of work. Realizing that Rebuilding Together focuses on a one-day event, the team separated “long lead” items that must be completed prior to the event day. For example, the drywall patching task had to be completely dry before applying primer and paint to the walls. With all things considered, the project team felt confident at this preliminary stage that all the owner’s wish list items could be met. The project team made a table detailing the

scope of work for the project as perceived by the project team, including separating those items that could not be physically performed on the same day.

Estimate and Schedule

Each of the three project superintendents was responsible for performing a project take-off, budgeting costs, determining the amount of skilled and unskilled labor, and scheduling the work necessary to complete their respective tasks.

Project Schedule

Day	Labor Force	Description of Work
4/22/06 (prep)	Volunteer Group #1 and Project Team	Move contents of home into secure, storage container
4/23/06 (prep)	Project Team	Clean and prepare walls, cabinets, and ceiling. Patch drywall at various locations
4/25/06 (prep)	Project Team	Apply primer to walls and ceiling. Power-wash exterior of house
4/29/06 (event day)	Volunteer Group #2 and Project Team	Perform remaining project scope of work items

Materials and Supplies: Materials and supplies from the Rebuilding Together warehouse were available to project teams free of charge on a first come, first served basis. This warehouse had nails, screws, paint, paint brushes, tape, drop cloths, gloves, safety glasses, buckets, sand paper, and miscellaneous plumbing fixtures. The house captain had \$2500 worth of gift cards for purchasing construction materials at the local building supply store. Donated materials and supplies were also available. Each project team was responsible for collecting donations through local construction companies and suppliers. Due to the many well established relationships through the project team's construction experiences with local suppliers, several thousand dollars worth of items were donated as follows:

- 1.) Air Conditioning Unit (\$1000)
- 2.) Interior Paint and Primer (\$1200)
- 3.) Carpet & Padding (\$900)
- 4.) Miscellaneous Electrical (\$150)

Labor Force: One of the responsibilities of the volunteer coordinator was to recruit skilled and unskilled labor for the project. The volunteers were required to complete applications that listed their skills. The volunteer coordinator organized these applications based on the skill set of the individuals. The information collected was shared with the project superintendents for planning and scheduling the work. Additionally, the volunteer coordinator separated the list of volunteers into sub-groups based on availability. Due to the schedule, a large number of unskilled laborers would be needed the weekend before the big event to perform a moving task. During the big event, the project superintendents were able to shift the labor force between various tasks in order to minimize idle time with each worker while achieving the efficient operational flow.

Site Logistics

Because the duration of the project was short, site logistics became a critical aspect of planning.

Project Staging: The owners had occupied the 862 square foot home since it was built in 1954 and had accumulated many possessions over years that had to be removed and replaced. Additionally, neither they nor their two guard dogs could leave the premises during the project. One of the two bedrooms was stacked from floor to ceiling with papers and books and could not be entered. The project team felt this was a dangerous fire hazard for the elderly owners.

The project scope included replacing the carpet and painting the walls and ceiling throughout the home. Due to size of the home and the limited mobility owners, the project team had to come up with an innovative plan for the work. Reviewing the project plan, the project team affirmed that the walls, ceilings, and cabinets had to be prepped the weekend prior to the one-day event. In order to accomplish these preparatory tasks, the project team had to remove and replace the contents of the home both the weekend prior and the weekend of the big event. Realizing that moving the contents of the home two times would be non-productive and use up too many resources, the project team came up with a new plan. Due to the fact that there was wet weather in the forecast and the project was located in a high crime area, the contents of the home could not be stored outside. Rebuilding Together agreed to have a medium-sized, secure, enclosed storage unit delivered to the home the weekend prior to the big event at no cost to the project team's budget. The storage unit was adequate for storing the loose contents of the home and some of the large furniture. In order to expedite this moving process, the owner's children were asked to pack all the contents of the home into moving boxes provided by the project team.

The volunteers for this project were only available to work on the weekends. The project team planned to remove the house contents on the Saturday prior to the big event day and to replace the contents immediately following the big event. Since the owner must remain in the home during the week when the house contents were secured in the storage unit, the owner was asked to set aside essential items during this off-week (food, cooking supplies, bed, clothes, television, couch, etc).

Material Storage: The only space available for storing materials on the project site prior to the big event was in the one-car garage. This garage was already full of the owner's possessions. The project team was able to make space available for storing paint, drywall, doors, and miscellaneous supplies. The remaining materials were stored with the project team members and delivered on the day of the event.

The Rebuilding Together organization provides a thirty cubic yard dumpster for each project site. The dumpster was adequate for all construction debris, including old fencing, carpet, and yard waste.

Tools and Equipment: The Rebuilding Together warehouse has a limited number of tools on-loan and available on a first come, first served basis. Some of the available tools included shovels, wheelbarrows, ladders, and yard trimming tools. However, the project team relied on each of the skilled laborers to provide their own tools during the big event, based on their respective trades. The house captain brought a trailer full of his personal tools, and each of the project superintendents provided tools for their respective trades.

Project Implementation: The Big Event Day

Resources: Rebuilding Together was extremely organized with the proper resources in place to tackle any unforeseen problems. With fifteen projects occurring in the same vicinity at the same time, material runners who were available for trips to a local building supply store to pick up last minute material items. A moving truck stocked with Rebuilding Together warehouse supplies was stationed at a central location to provide additional painting supplies. A few of the skilled trade people were designated as “trouble shooters,” and assigned to assist with three homes at one time. These trouble shooters had the ability to solve unusual problems, provide additional labor resources, and obtain necessary materials, tools, and supplies. Breakfast, lunch, and beverages were provided for the volunteers. If one of the fifteen project teams completed its home ahead of schedule, it volunteered to help the other project teams as needed.

Service Learning Project: The volunteers arrived in full force by 8 a.m. on the big event day. The project superintendents immediately assigned tasks to volunteers based on their skill sets. The house captain met periodically with the project superintendents to evaluate the progress. Volunteers were assigned and reassigned as needed on an hourly basis. The project team, consisting of skilled labor, ended up taking the lead in most of the project tasks. At times the project was very chaotic, with over forty volunteers in and around an 862 square foot home. By lunch time, the project team had determined that it was on schedule and would be ready to move the house contents back by 3pm. The volunteer coordinator provided a barbeque-style lunch and the work proceeded. After lunch the carpet installers began to run behind schedule, and were not ready to have the house contents replaced at 3pm. A second wave of volunteers arrived at 3pm as scheduled to replace the house contents. After waiting thirty-minutes, these volunteers were sent to another project until the carpet installers were ready. The carpet was not completed until nearly 7pm, and the remaining few volunteers and project team moved the house contents back into the home.

Punchlist Items: Due to this project delay, the floor installers returned the following day to install the linoleum in the kitchen. The owner was completely satisfied with the work performed, and no other punchlist items remained.

One Month Later: The house captain was contacted for a few items including a crack in the porcelain base of a new toilet, a short in the kitchen electrical, and a broken new kitchen faucet. The house captain replaced the toilet and the kitchen faucet. The electrical was repaired by a licensed electrical volunteer.

Results

The project team worked extremely hard during the planning stage in defining an achievable scope of work and organizing volunteers to make the project a big success. The project team stayed under budget by maintaining a good plan in the budget and by securing many valuable donations. Although the project team tried to anticipate unforeseen problems, there were many trips by volunteers to the local building supply store to purchase additional materials.

The biggest unknown in a project of this nature is the skill level of the volunteers that actually show up to help with the event. With this being a service learning volunteer project, some people do not feel obligated to fulfill their commitments. The project team members became a large share of the skilled labor, and thus were not able to perform management responsibilities. This common construction management error was substantiated by the fact that some of the skilled labor volunteers did not show up for the event.

The carpet installers became the controlling operation, which ultimately delayed the project completion. The project team had requested a large number of unskilled labor arrive onsite at 3pm to assist with moving the house contents back. With the carpet installation incomplete, there was no work available for the unskilled labor. The unskilled labor was sent to another project site. Once the carpet installation was completed later in the evening, the remaining labor force, consisting mostly of the project team, had to move the house contents back.

The project staging was a success. The house contents were adequately packed and reduced by the owner's children, allowing enough time for the volunteers to move things into the storage container. The house contents were moved back into the house immediately after the big event, inconveniencing the owner for only eight days as originally promise.

Discussion

Lessons Learned from the Service Learning Project:

Project Goals

There were three main goals to this "student" service learning project:

- 1.) Complete the project on-time and under budget. With the exception of the kitchen linoleum, the project was completed by the end of a very long day of the event. The \$2500 was maintained by a margin with a savings of approximately \$75.
- 2.) The project team consisting of senior level construction management student to learn management skills. The project team applied these skills, such as estimating, scheduling, site logistics, labor force issues, and project management, with a high level of success.
 - a. The schedule was lacking detail. The project team felt confident in their simplistic schedule due to the fact that they had the time and resources to perform many long duration items before the big event. The house captain recommends that a specific individual be assigned to maintain a uniform schedule throughout the project duration. This schedule should be coordinated with the project superintendents and have the ability to change with the labor force availability.
 - b. Although the project budget was met by a margin, the project relied on a large amount of donations from local suppliers. The large donations may not be achievable with other project teams. The project team may need to look more closely at the project costs at an earlier stage, and be required to reduce the project scope of work to maintain the budget. The house captain needs to have better oversight on this spending during the project duration.

- c. The most difficult unknown constraint with this project is the level of skilled volunteers. This skilled volunteer force must be re-evaluated constantly throughout the day. The house captain may try and get skilled labor to commit more securely if these skilled laborers are given assigned tasks, such as titles “foreman.” The project team should not perform the work, but rather manage it.
- 3.) The volunteers, consisting solely of construction management and civil engineering students, were able to gain construction experience. Many of these younger students do not have a strong construction background. The tasks they performed teach them about how things are constructed, which is highly important in developing strong estimating, scheduling, and management skills.

Lessons learned

The level of success for this service learning project, as well as any construction project, is based on the level of planning. This planning includes how much anticipation there has been for unforeseen field issues and the unknown labor forces. The house captain recommends that there be more structured scheduling and estimating from the project team.

Every project will have one task that causes some sort of project delays. The carpet should have been installed prior to the one-day event, and then covered with plastic to paint the walls and ceiling.

A Look Towards next year's Service Learning Project

In an effort to involve more students in this service learning project and to reduce some of the workload the previously designated project superintendents, the professor will assign the following positions :

- Project Manager (house captain, overall responsibility) - Professor
- Estimator (budgeting, ordering materials, runner on day-of-event)
- Scheduler (determine project schedule, maintain it during event)
- Project Superintendent (oversee project engineers, report to house captain)
- Project Foremen (skilled labor only, report to project superintendent)
 - Carpentry
 - General Labor (paint, yard work, etc)
 - Plumbing (as needed)
 - Electrical (as needed)
- Volunteer Coordinator (skilled and unskilled labor list, food, thank you letters)
- Safety Coordinator (hard hats, ladders, cutting, etc)
- Tools Person – checkout, list of individual

References

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