City Farm of SLO Animal Feed Shed

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The City Farm of SLO is a local nonprofit for San Luis Obispo that functions as an education center for individuals looking to live more sustainably. This organization teaches different aspects of farming such as planting crops, taking care of them, how to care for a wide variety of farm animals, and maintain the health of the farm. To achieve all these objectives, facilities must be in place to ensure the correct number of materials are available. One lacking feature of this farm is the space to store animal feed. Before this project the food was stored outside subject to the weather. After a meeting with the farm manager, Shane Lovell, a senior project to build a shed was created. An 8’ by 12’ shed was determined to be sufficient to provide space for all the animal feed. It took five months of planning and finding outside sponsors to fund the entirety of the project. From several sponsors $7,500 was raised in addition to donated construction materials. After funding was secured, construction began, which took just 2 months to build. This project was built under budget and without having to use any of the 12% contingency that was accounted for.

Key Words: Farming, Nonprofit, Animal Feed, Shed, Construction

How Project Came About

This project was located at the City Farm of SLO that can be found at 1221 Calle Joaquin, San Luis Obispo, CA 93405. The City Farm of SLO is a local nonprofit for San Luis Obispo that functions as an education center open to the public. The City Farm of SLO consists of a board of members that run the organization and a team of staff that runs the day-to-day operations. I worked closely with two of the staff members, farm manager Shane Lovell, and executive director, Kayla Rutland. This coordination of work between the farm and I started by the farm reaching out to Cal Poly Construction Management Department proposing senior project ideas if anybody was interested. After an initial consultation with the farm manager and executive director I decided to take on the shed project.

This project is an important aspect to the farm as one of the objectives of the farm is to educate people how to raise and care for farm animals. As part of caring for the animals is to keep them well fed, food is kept onsite at the farm. However, this food was kept outside subject to the elements. Rain and wind would quickly deteriorate the food source restricting how much food could be kept at the farm.
It was determined that an enclosure or shed-like structure could prolong the life of the food and give the ability to store more at a time. This would reduce the frequency of animal feed orders and allow that time to be allocated elsewhere on the farm. A shed was the preferred idea of what was going to be built, however substantial funding would be required to build such a structure.

This project was simple in idea but contained several obstacles to tackle before construction could even begin. The major obstacle for this entire project was the lack of funding allocated to this project for the farm. The farm had several other projects to fund and was hesitant to donate to the shed project. After months of outreach to several sponsors funding was secured for the entirety of the project. The farm offered to help with funding in case costs went over budget.

**Process of Student Project**

*Design and Funding*

The design of the shed was complied with from a variety of sources. In this project the farm manager, Shane Lovell, was treated as the client. This approach was taken to put the farm’s interest first followed by constructability concerns and architectural design. The primary concern from the farm manager was that it would be waterproofed to keep the animal feed dry. The farm manager was also concerned with proper clearance of the ground and the shed so unwanted animals could not burrow underneath it. It was also stressed that a barn door was wanted to utilize space since the shed backs up to the sheep enclosure. It was clearly explained to the farm manager that the decision for a barn door was a less than optimal choice in a door when considering waterproofing since it lacks a seal.

*Figure 1. Initial Design and Overall Dimensions*

As mentioned above one of the great obstacles with this project was the approach to how this shed was funded. No funding was provided by City Farm of SLO so outside funding was relied upon. The sponsors that provided the financial support were Hensel Phelps ($1,000), Bogner Pools ($1,000), CMAC ($1,500), and the Alliance Foundation ($4,000). In addition to this Simpson-Strong Tie provided the fasteners, anchor bolts, other bolts, and nuts needed for construction. With this generous funding the farm manager’s considerations, constructability concerns and architectural design could all be taken into account. This process of acquiring funding took place in November till late March. It was the longest process in the project’s timeline.
Schedule and Estimate

Before outreach to possible sponsorships, it was advised to be as prepared as possible. Hence, developing an accurate schedule and estimate seemed like a great way to achieve this. A preliminary schedule was created and adjusted over the life of the project to show how the project turned out. Similarly, the estimate was drafted up this way to envision how the project would go and adjust it to what materials and costs would be accrued over the life of the project.

![Updated Schedule for Project Timeline](image1)

**Figure 2. Updated Schedule for Project Timeline**

![Initial Estimate for Animal Feed Shed](image2)

**Figure 3. Initial Estimate for Animal Feed Shed**
Construction

Phase one of construction started in early April due to awaiting funds and weather delay due to rain. However, once these issues were resolved construction of phase one began. Phase one consisted of breaking ground to a complete subfloor system to await walls to be framed upon it. This process took roughly two weeks to complete with the help of other Cal Poly students as pictured in figure 5. The layout was dictated by measurements off the sheep enclosure fence pictured below in figure 5. This was proven difficult since the fence was not straight and coordination efforts were made with another Cal Poly student building the adjacent pathway. Once firm measurements were taken six footing holes were dug and filled with concrete with post hangers. A total of 2,160 pounds or 14.4 cubic feet of concrete was required to fill the footings.

The subfloor system was designed to be strong and long lasting as possible for this farm. To ensure that, pressure treated wood was used and oversized lumber for this application. The three beams spanning eight feet pictured below were 4’x8’ beams and the surrounding joists were 2x8’s. In addition to six footings being used compared to four. Architectural professors from Cal Poly were consulted and it was confirmed that this system was more than strong enough for its’ desired purpose.
Once the subfloor system was complete, phase 2 could begin which would consist of much of the building. Such as framing the walls, framing the roof, applying building, and roofing paper, completing the roof, installing, and waterproofing the windows, and painting the T1-11 siding. Due to the rainy season of winter and spring of 2023 it was imperative to get this building dried in as soon as the walls went vertical. This obstacle was overcome by employing the help of three other Cal Poly students and one professional constructor to complete all these tasks over the course of three days. This was only possible because everybody was committed to this process and spent an average of 10 hours a day building phase 2.
After phase 2 was completed, it rained for the following three days. It was a combination of luck and determination to get this building dried in before it rained. The only part of the shed left exposed to the rain was the barn door opening that would be constructed phase 3. This was fixed with temporary plastic to keep the water out of the structure. This would later be removed once construction of phase 3 begun. Every part of phase 2 went according to plan except for sourcing issues with one of the windows, so only two windows were installed. Coordination with the farm manager helped finalize where the windows would be placed.

Figure 7. Day 3 of Phase 2

Once phase 2 was completed, the course of construction took a slower pace for phase 3. This was due to a reduced number of people working on the project. This worked out since phase 3 involved labor reduced tasks. Phase 3 consisted of building the barn door, installing the barn door hardware, pouring a concrete step, installing trim, and painting every exterior wood surface. Phase 3 took four weeks to complete, taking small details into mind. For example, the barn door was retrofitted with fabricated pieces of steel so that someone could not pull off the door from underneath. Another example could be painting the eaves of the shed. Simple in theory but time consuming as it was all painted by a hand brush and an eight foot step ladder. These types of small details were taken into consideration to build the best type of shed for the farm and taking pride in the work Cal Poly students put forward.
Phase 3 was the final construction tasks and finished in line with the schedule in figure 2. This project was finished just in time with the schedule of spring quarter of 2023. With the completion of phase 3 in week nine of the ten-week quarter here at Cal Poly San Luis Obispo. This left enough time to complete final deliverables in post construction.

**Lessons Learned During the Process**

The biggest lessons learned from this project were not in the construction phase as expected but in the preconstruction planning phase. I was given the opportunity to take on this project if I led the charge on a variety of aspects. For example, the lack of funding was the biggest obstacle overcome in the preconstruction phase. Funding resources were referred from personal sources, networking connections, and sources from Cal Poly professors. However, it was my account to provide them with a viable proposal for what was going to be built, why it was being built, and it could support a senior
Cal Poly construction management student. After multiple attempts to acquire funding, it became clear what sponsors were looking for and how I could convince them to help my cause. This project taught me how working with a client can be challenging at times, to explain to them why certain considerations must be considered and may change their desired outcome of the project.

Some of the lessons learned were in constructing the shed itself. Cal Poly’s logo of “learn by doing” was clear in this case. The prior knowledge from this project was from the classes I took at Cal Poly as they prepared me for what to expect. However, real life experience like this project showed me what I knew to be true and what I did not know at the time. Some construction practices were learned after some improper installation. This led to some remodeling work, but it turned me into a better builder for the future.

**Deliverables**

This Animal Feed Shed at the City Farm of SLO was an overall successful and positive project. Preconstruction services were provided to secure funding and finalize design efforts. Construction services were executed to build what was planned to help the farm’s lacking animal feed facilities. Finally, the completed construction project was presented to the City Farm of SLO and the Cal Poly Construction Management department. The City Farm of SLO clients, Shane Lovell and Kayla Rutland, were pleased and excited with the free shed built. Many of the farm volunteers also commented how they liked the shed whether it be impact it would have on the farm itself or the aesthetics of it. The sponsoring companies were influential in making this project possible and wanted to see myself succeed in my endeavor in taking this project on. The Cal Poly Construction Management department that had a chance to be involved and see the shed were impressed of what got built and proud of another successful senior project here at Cal Poly San Luis Obispo.