This paper covers the planning, fundraising, design, construction, and installation associated with building the Growing Grounds Farm of Santa Maria greenhouse planter bench tables. Growing Grounds prides itself on nourishing the local community through a combination of horticulture therapy, and vocational training for individuals with severe and persistent mental illness. The farm offers various opportunities for socialization and interaction with coworkers and customers. After meeting with the farm managers, Anna Wiens and Keith Bartlett, it was clear that this project was of the highest priority. Upon agreement of the project, the farm managers and I determined the future vision and narrowed expectations into a concise project scope. This paper describes the steps to fundraise, design, plan, and build the desired project for Growing Grounds. This individual project was assisted by fellow Cal Poly student volunteers and funded by four local construction companies. Full funding was secured over the span of two months which consisted of networking and contacting local construction companies. Shortly after funding was received, off-site prefabrication construction and installation occurred. The final deliverable was completed one month prior to the farm manager’s desired deadline. This project was completed in three months and $3,633 was donated for this project.

**Key Words:** Greenhouse, Tables, Construction, Prefabrication, Installation

**Background**

This project based senior project is located at the Growing Ground Farm at 820 W Foster Rd, Santa Maria, California. Operated by Transitions Mental Health Association, Growing Grounds serves as a nonprofit wholesale nursery providing therapeutic horticulture, socialization opportunities, paid employment, and soft job skills training for adults with severe mental illness. Throughout my college experience, I volunteered at the organization’s San Luis Obispo location with the Cal Poly Associated General Contractors chapter. I was confident that this was the organization I would like to provide for as a part of my senior project.
In October of 2022, I met with the farm managers, Anna Wiens and Keith Bartlett, to discuss potential senior project ideas. A multitude of project options were discussed, but the most reasonable and highest impact project was to build the greenhouse bench tables they were desperately in need of. After putting together an initial design and estimate, I spoke with my subject matter expert (SME), Andrew Kline, to discuss project feasibility and expectations. Once full funding was secured, I received approval of the project from subject matter expert (SME), Andrew Kline and senior project director, Phil Barlow.

**Design & Fundraising**

Prior to reaching out to local construction companies for fundraising, I finalized a complete design with a detailed estimate. I shared my design and estimate with Anna and Keith, before potential project sponsors. The estimate included pressure treated lumber, exterior screws, delivery costs, plastic grated tabletops, protective tarp, chop saw rental, pipe hanger straps, PVC pipe, custom yard signs, and transportation costs. The initial estimate resulted in a total cost of $3,493.81. This complete estimate was provided in a brochure handout to all potential project sponsors during fundraising.

In addition to the project estimate, I created digital drawings of the tables with dimensions that were utilized during material take-offs for the complete estimate. Based off these drawings, I put together 3D renderings in SketchUp to be included in the project sponsor brochures as shown in Figure 1 and Figure 2 below. The design depicted 16 individual tables, that created 4 parallel aisles, with one aisle running perpendicular in the center. The tables showed a 4’x8’ tabletop area which was elevated by six 2’-3” legs. These tables were designed to enable plant elevation to a workable height for customers and farm workers for easier accessibility. The tables were designed with the intention of rolling carts to fit in between the table aisles.

The project sponsor brochures were provided to the companies in an email with follow-up phone calls or in-person meetings as necessary. Contractors and Developers Bonding donated a lump sum of $1,750. Specialty Construction, Inc. covered the cost of all lumber and hardware resulting in a total of $1,163. Blois Construction donated a lump sum of $500. Precision Construction Services donated a lump sum of $250. The total funds raised equated to $3,663.
Immediately after funding was received, off-site prefabrication began. This phase was the first phase of construction, which consisted of building the tabletop frames and cutting the table legs. In order to streamline efficiency, I built the first tabletop frame with all cross member supports complete. I then built the next frame directly on top and lined up all cross member supports and verified exact dimensions. See Figure 3 below for technique. This process was utilized for all 16 units. In order to cut the table legs, a chop saw was necessary to efficiently cut through the 4x4 lumber members. I rented a chop saw for an allotted time of 4 hours which cost $36.82 and cut all 96 table legs in roughly 3 hours. The entirety of the off-site prefabrication of the units consisted of 20 man-hours of construction. This process was extremely efficient and the rotation of four 20v batteries for the drills allowed for minimal downtime when fabricating the units.
During the material buyout phase, some cost savings were revealed thanks to a supplier of the plastic grated tabletops that Farm Supply uses. I had the material priced at $1,598.72 based off the online supplier costs, whereas Farm Supply ended up getting it at a cost of $1,227.05. This resulted in cost savings of $371.67. An additional change was made in the form of adding additional 2x4 cross supports in the tabletop frames. This was to help keep the table sturdy over time and avoid any warping due to heavy loads on the tables. This cost was not shown in the initial estimate, but funds were available within the budget. Additional screws were needed for this change as well. The 2x4 table frames were built to have a 4’x8’ surface with cross member framing spaced out with gaps no larger than 2’.

During the off-site prefabrication portion, I was working in between rainy weather conditions. This was a challenge largely due to necessitating material storage. The table frames were incomplete as the legs had not been attached to the tabletop frames, unwanted warping could occur due to shrinkage and expansion of lumber in the rain and sun. Aside from that, working with saturated lumber is never ideal. Therefore, covering the lumber with a waterproof tarp and utilizing an organized material laydown method was critical. This was difficult due to the amount of lumber that needed to be covered, available space in yard, and strong winds during this time period.
In coordination with the farm managers and windows in between rainy weather, an installation date was agreed upon in January of 2022. I borrowed a dump trailer from a local friend in order to transport all of the material in one trip from San Luis Obispo to the project site in Santa Maria. With the assistance of one volunteer, I was able to install the tables at the farm in two days resulting in a total of 14 man-hours. The installation consisted of attaching the 4x4 legs to the table frames, securing the plastic-grated tabletops, and attaching the PVC shade arches. The plastic grated tabletops were requested by the farm managers to allow for drainage and any soil debris to fall through. Installation of the tables marked the completion of the construction phase which accounted for a total of 34 man-hours.

**Final Deliverables**

The final deliverables were completed partially during the construction phase upon installation of the tables. At which point, the farm was able to start utilizing them for their intended purposes. Anna and Keith requested that the tables be completed prior to their busy season which starts in February and March. I installed the tables in January of 2022, a month prior to the farm manager’s desired deadline. In addition, I promised all project sponsors photographed recognition of their support to Cal Poly Construction Management and the nonprofit organization. Once the custom ordered yard signs arrived, I made one final trip to the farm to take photos with the company signs and completed tables in use. These photos will be utilized by the companies to share their commitment to Cal Poly Construction Management students and their support of the local community.
There was also a surplus of roughly $220 dollars at the time of project completion. I informed Anna and Keith of this surplus and the following options: the funds could go towards any additional upgrades to the planter table area, purchase of tools for the farm, or as lump sum donation to the greater Growing Ground organization. They elected to go with the tool donation as they were in great need of a cordless battery powered leaf blower. This would be utilized throughout their property to ensure clean and clear walkways, in particular underneath and around their new planter tables. I felt this was an excellent use of the remaining funds. This tool donation was delivered at the same time that the project sponsor signs were set up for photos.

Lastly, I uploaded all project photos starting from existing conditions all the way through to project sponsor photos to a Dropbox file. A link to this file and overall project summary and update was provided to each project sponsor. I also created a LinkedIn post with all project stakeholders recognized to share with my network and promote the project.

**Lessons Learned**

This project gave me the opportunity to interact with a client in a professional, real-world project scenario. I was able to take responsibility and ownership from the start to finish of the project. I implemented skills that I learned during my time at Cal Poly throughout the planning, design, construction, and installation processes of the project. By utilizing software systems such as SketchUp and Bluebeam to create professional marketing content to share with project sponsors and client, I successfully presented the project in a creative and organized manner. Through the fundraising process, I learned what it took to communicate effectively and harness the support of local companies and connections. I also practiced the skill of managing the expectations of the client and understanding what they are ultimately looking for in their project.

Moving from the planning and design phase into construction, I practiced my hands-on building skills with a focus on safety at all times. I had the opportunity of managing others during this phase and prioritizing efficient delegation of tasks. As the project manager, I enjoyed the responsibility of

![Figure 6. Completed greenhouse bench tables w/o PVC shade structures](image-url)
having a comprehensive understanding of the objectives and logistics needed for this project to be successful. Having this mindset prior to working with others and delegating work was of the utmost importance. This instilled trust in those that were working with me and demonstrated the thought I put into the planning of my project.

The project not only was a rewarding experience but also a valuable opportunity to dedicate my time to an organization that is truly making a difference. Living by their own version of “learn by doing,” they are changing the lives of those struggling with severe mental illnesses every day. Being a local of San Luis Obispo, I have always had the urge to give back to this community that I am so appreciative to call home. This project provided me with that opportunity and taught me valuable lessons I will take with me into future endeavors.

**Conclusion**

The greenhouse bench table project at the Growing Grounds farm in Santa Maria was overall a personal and professional success. The clients, Anna and Keith, are very pleased with the end result and are already receiving positive feedback from farm shoppers. The sponsoring companies were eager to interact and assist at their available capacities. Lastly, the Cal Poly Construction Management department is pleased and proud of the work this project represents.

![Figure 7. Completed greenhouse bench tables with shade structures attached](image-url)
The Growing Grounds organization as whole, but specifically the farm location in Santa Maria is always in need of assistance in terms of building projects. The land they lease cannot have permanent structures, therefore everything must be movable. They are able to get creative and design in ways that doesn’t always require permitting. The organization has a handful of other projects ranging from renovation to new construction that they are in need of. Any students looking to pursue a project based senior project should reach out to the farm to discuss potential projects.