

Son Care Handicap Ramp and Fence

Brendan Mulholland
California Polytechnic State University
San Luis Obispo, CA

The purpose of this project was to build a fence on one side of the parking lot and a handicap entrance ramp for the front entrance of the Son Care Foundation in San Luis Obispo, California. This project aims to help limit the edge of the parking lot so that cars are not parked too far into the neighboring field and to make the front office more accessible to customers. The parking lot for The Son Care Foundation is located next to a field that is used for a multitude of tasks. With nothing to separate the two areas from each other, the cars were parking in the field and getting in the way of the operations going on in the field. Constructing a fence created a barrier between the two zones and kept the operations from interfering with each other. In addition to being a day care for dogs, the resort also helps pair disabled individuals with service dogs. The front entrance of the main office was not very accessible to these individuals. Building a ramp in place of the awkward front porch made the entrance much more inviting and usable for anyone who wished to visit the resort.

Key Words: Non-Profit, Accessibility, Carpentry, Design Build, ADA

Introduction

Providing help to those who are unable to help themselves is one of the best things that a person can do. The Son Care Foundation strives to do exactly this every day. The foundation accomplishes this goal by creating programs for young men to put together a life map that can be used to guide them in making wise decisions. However, a job like this is not the most financially stable, so the Thousand Hills Pet Resort was started to make sure that the foundation did not have to rely on gifts and grants to continue to help people. As these businesses grew, they began to branch into new areas of their professions. With the realization that these new ventures would require more funding, Son Care created more non-profits. Today Son Care manages five additional non-profits: Thousand Hills Pet Resort, New Life K9s, Mission Cars, Gentle Touch Pet training, and Alpha Academy, in order to make sure that each entity would be around to provide for the community in the years to come.

Meeting Son Care

When starting out, most students plan on completing a research-based Senior Project. These projects can take a long time and require a lot of planning. Research has never been a particularly strong skill for the student, which made it difficult to believe they would be able to complete a project of that magnitude. Time was beginning to run out for the student when their roommate said that he would be doing a bathroom renovation for a place called Thousand Hills Pet Resort for his Senior Project. He mentioned that there was a list of projects that the business needed completed, so he put the student in contact with the owner.

It was a few days later when the owner, Jack, was able to meet. After a brief introduction, Jack introduced the student to Dillon Jamison, whom he would be the point of contact and communicating for the duration of the project. The rest of the afternoon was filled with walking around the campus and learning about the different businesses that inhabited the space. It was at this time that Dillon

explained that he worked for Son Care and that Son Care was responsible for managing the other non-profits. Also, during the tour, Dillon showed the location of each of the projects that were yet to be completed and gave a brief description of each to explain what they wanted done. After some consideration it was decided that the student would be completing two of the smaller projects. The first project was the installation of a fence along one side of the parking lot in order to separate the lot from a space of land that was used for various tasks. The second project was the continuation of an older senior project that was unable to be completed due to COVID-19. This project was the creation and installation of a handicap ramp up to the front door of Son Care's office. With the project decided it was time to get to work.

Project Background

The Son Care Foundation was the lead non-profit collaborator for this Senior Project. It is located in San Luis Obispo, California and is built on a forty-acre ranch. The ranch is also home to Thousand Hills Pet Resort, New Life K9s, Mission Cars, Gentle Touch Pet training, and Alpha Academy which are all managed by Son Care. The team that was put together to complete this project was made up of Dillon Jamison and the student. Dillon already had the funding that would be needed for the project as it was supposed to be completed the year prior. He also was the person who approved all the designs and expressed expectations for the end result. The student's tasks for this project included designing, building, and installing the projects. The fence was expected to just act as a divider, so it did not require in depth planning or have any codes that needed to be followed. The handicap ramp was a much larger task and required some in depth planning and had to follow the codes and guidelines set forth by the American with Disability Act. These governmental regulations stated the conditions that the ramp needed to meet if it were to be constructed. These requirements put up a few hurdles that forced some changes in the design of the ramp, but these issues were soon cleared, and work was able to begin.

Construction Process

The first step to for this project was to find out what Son Care expected to have when everything was finished. To achieve this a first meeting was held. During this meeting Son Care described that they wanted to have a fence built that would separate the parking area from the field that was next to it and a handicap ramp installed in front of the front entrance of the building. Figure 1 depicts the location of the fence with a green line and the location of the handicap ramp with a red line.



*Figure 1: Property Overhead View of Buildings on the Ranch
Parking Lot Fence*

As the non-profits on the ranch increased the amount of business that they conducted, there came an increased need for parking. The creation of a parking lot solved this problem. However, the Southern side of the lot did not have a hard boundary to it. As a result, customers who parked in this lot tended to park beyond its boundary and in the field adjacent to it. In order to keep the customers safe and keep the field clear Son Care wanted to install a fence. The first meeting of the project was conducted by Dillon. In this meeting he stated that the fencing material was already on the site, so there was no need to procure the material itself. The fence needed to span total distance of fifty-three feet. The stockpile of fence parts that Son Care already had contained both fifteen feet and eight feet long sections. It was then decided that three of the fifteen feet long sections and one of the eight feet long sections would be used. The fifteen feet long sections were too heavy to span their entire length so they would require an extra post in the middle to help carry the weight. The posts themselves were seven feet tall. Five feet would be left above ground and two feet would be set in the ground. With the realization that eight holes needed to be dug, each at a depth of at least two feet, it became apparent that this task would be too difficult to do by hand. Dillon suggested that renting a small skid steer with an auger bit would make this task much easier. With the “how” problem solved it was time to figure out exactly where the fence would sit.

After layout and installation supplies were procured it was time to mark where the fence location. The process was far from smooth and took a few attempts to get right. In the end a one-hundred-foot tape measure and some layout paint were used to make the center location of each post and then spray paint was used to create rough outlines of the holes on the dirt. With approval from Dillon work was now ready to begin. A few days later we were able to pick up the skid steer and auger bit and begin to dig out the holes. As soon as we began to dig, we became immensely grateful for having rented the skid steer. The top few inches of the excavation were gravel from the parking lot, but the rest of the hole consisted of black clay like soil that even the hydraulic auger had a hard time digging up. The dirt even managed to stop the auger dead a few times. Even with this unforeseen difficulty the skid steer was still able to finish digging the holes in just a few hours.

With the holes for the posts now dug it was finally time for installation. Before beginning to put the fence into place it was believed that this would be a simple task. This assumption was quickly proven wrong when we realized that the fifteen feet long sections seemed to have a mind of their own. The initial plan was to use metal stakes and tie wire them to the posts to hold the posts in place, but the weight of the fence would just pull the stakes out of the ground. After a day of redesigning, it was

decided that holding the posts from the top would provide much more stability. During the first attempt a lot of time, money, and resources were wasted. In order to prevent this mistake from happening again a model was made. The model is shown in Figure 2, and proved to be very useful when trying to envision how the post would be help up while their positions were finalized.

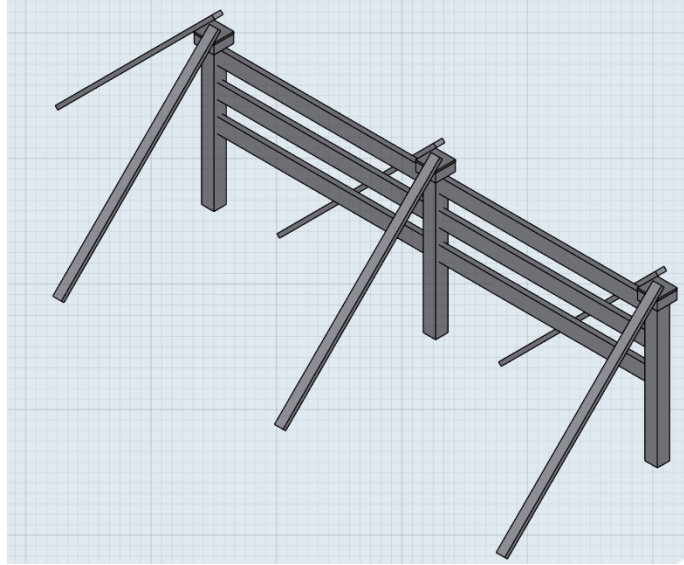


Figure 2: Fence Installation Model

By creating the model, it became much easier to envision how the fence would be put together. With this new foresight and the knowledge from the previous mistake the second attempt at the installation of the fence went much smoother. Even with the extra knowledge and experience the task still took another two days to complete. With the fence finally standing and held in place, it was time to fill in the holes with concrete and finish up this part of the project. Sone Care consistently had projects being completed on the campus and many of them required the use of concrete. Because of this they already had a pallet of ready mix concrete on site. Son Care does not own a concrete mixing machine and renting one was not practical. Unfortunately, that meant the concrete had to be mixed by hand. A quick estimate suggested that about twenty bags of concrete mix would be needed to fill the holes. After three and a half hours the total number of bags used came out to eighteen. With a slight addition from a nineteenth bag the concrete was finally complete. The fence was then left for two days to make sure that it would not move as the install jigs were taken off. Once the install jigs were removed the fence was washed clean. At this point the post caps were pressed into place on the tops and outsides of the outermost posts. With one last check and approval from Dillan the fence was completed and can be seen in Figure 3.



Figure 3: Completed Parking Lot Fence

Accessibility Ramp

The Son Care Foundation and some of the other non-profits that the business manages are dedicated to helping individuals who may need some extra assistance. The main entrance to the office building has a small porch in front of it. This porch creates a large step up from the concrete of the walkway and a second smaller step from the porch to the threshold. In addition to the steps, the porch is angled down and away from the side to the building. These conditions, which can be seen in Figure 4, combined to make it rather difficult for those with disabilities to enter the office. Replacing this awkward entrance with a ramp would allow the much needed ease of access that the building demanded.



Figure 4: Son Care Foundation Front Entrance

In order to get the project started it was agreed that an initial meeting would be needed to bring those involved to the same level of understanding about what was to be done. During the meeting it was revealed that in the year prior to this project another Senior Project Group had volunteered to complete this project. Unfortunately, the group was unable to fully complete the task due to the restrictions put in place because of COVID-19. As a result, the previous group was only able to create a set of plans for the ramp. Upon reviewing these plans and after a year of thought Son Care had decided that the plans that had been created were not to their liking and desired to have something

different. The original plans were not far off from what Son Care wanted but the changes that they wanted to make did call for the redesigning of a couple of aspects of the ramp.

The redesign of the ramp required some research into the requirements of the Americans with Disabilities Act. The ADA sets forth the codes and regulations that must be fulfilled in order to render a facility usable by people with disabilities. Sections 405, 406, 505 outlined the specific requirements that were needed for this ramp. As it turns out the requirements for a ramp are relatively simple. The snag that the design kept running into was how to make a reliable handrail. The specifications for handrails on ramps are very stringent and would have been incredibly difficult to adhere to. After a closer look at the codes, it was discovered that anything with a slope of less than five percent is considered to be a “change in slope” and not a “ramp”. This distinction became vital to the design of the project because it meant that there no longer needed to be a handrail. For the duration of this paper the structure will continue to be refereed to as a “ramp”, even though, according to code standards it is technically not a ramp. Now that the ramp was not required to be accompanied by a handrail, we had freedom to design a handrail to our liking.

With a new description of the structure that Son Care wanted, and the knowledge gained from the background research a model was created. The model can be seen in Figure 5. This model was created with ideal conditions in mind. Existing conditions on site were not ideal and forced numerous field changes. However, the model still served as a useful representation of the structure.

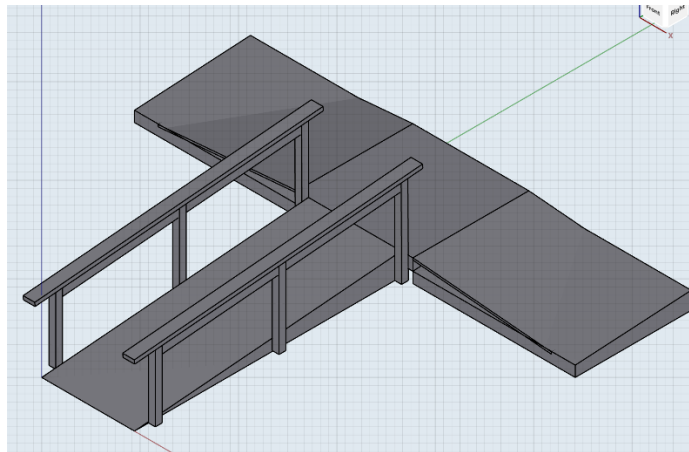


Figure 5: Model of the Accessibility Ramp to Son Care's Entrance

Once the design of the ramp had been approved construction was able to begin. As helpful as the model was during conceptual design it became much less useful during construction. This was due to the fact that absolutely nothing on site was square, flat, or level. This was a fact that was only discovered after construction had begun. The fallout of this discovery was that there was no repeated cuts or measurements, so each element was made completely custom.

From the design that had been created a rough estimate was compiled of the materials that would be needed to build the ramp. Seeing as there was no special materials required for the project everything was able to be acquired at the local hardware stores. As the project went on, it became apparent just how rough the estimate had been. Multiple times trips had to be made to the stores to get more

materials or purchase something that had been missed. Being able to source everything locally made this issue much less troublesome than it could have been. There was still a great amount of time lost and wasted due to the poor estimate.

Construction began with the removal of the molding between the deck and the wall of the office on either side of the door. Next the existing deck in front of the door had to be removed. The ADA Codes called for a flat space at least five feet by five feet wide before the door so that individuals would have space to maneuver around the door. This meant that the deck had to be artificially raised, as depicted in Figures 6 and 7, to sit flush with the threshold of the entrance.



Figure 6: Framing that Supports the Landing



Figure 7: Completed Landing

The next part of the structure to be completed was the main section of the ramp. Framing in the ramp proved to be the most difficult part of this structure. The new landing created an unappealing overhang, so the top of the ramp frame had to be notched to fill the gap. When facing the building the left side of the walkway sits higher than the right and also curves along its length. The combination of these two factors meant that each of the runners had to be cut at different angles and slightly different lengths as shown in Figure 8. Figure 8 also shows how each piece of the frame had its own measurements due to the unevenness of the concrete. With the frame complete exterior grade plywood was placed over the pressure treated frame. Figure 9 shows the unpainted stage of the finished ramp. In order to make sure that the ramp did not deteriorate or begin to creak as it aged exterior grade epoxy was applied to every joint and exposed edge.



Figure 8: Frame of the Main Ramp

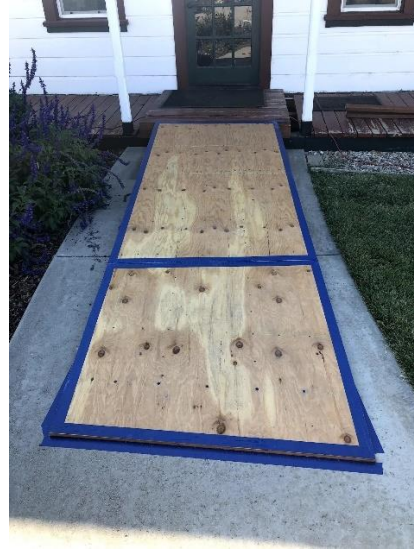


Figure 9: Constructed but Unpainted Main Ramp

Because of COVID-19 there were a couple of issues with procuring the paint from the manufacturer. Once these problems were solved painting began. Many layers were needed to properly cover the ramp, so while each coat was drying the side ramps were constructed. When the new landing was installed, it raised the portion of the porch in front of the door a few inches above the rest of the deck. In anticipation that those who needed the main ramp would also like to walk along the porch, side ramps were designed to eliminate the step. These side ramps were not as difficult to produce as the main ramp was, but still provided a host of challenges as they had to accommodate the more drastic angle of the deck and were forced to extend around the posts that support the porch roof. Figure 10 depicts both the framing for one of the side ramps and a completed side ramp.



Figure 10: The Framing for One Side Ramp with a Completed Side ramp in the Background

The primer coats of paint did not require much drying time which allowed for work to be done near them while the paint dried. The finish coats of paint needed a significantly longer amount of time to dry and thus prohibited work from being done during this time. In order to take advantage of this forced downtime the fence was erected while the layers of paint dried. The installation of the fence finished just as the last coat of finish paint was done drying. With the ability to work restored, the guiderails were built and installed. The posts were mounted into Simpson Strong-Tie post bases and then secured to the concrete with one half inch Tapcon concrete anchors. The guiderails were then painted white to match the siding and roof supports on the front of the office. To comply with the last piece of ADA code, aluminum six-inch-wide door thresholds were placed at the bottom of each ramp to transition the ramps to the concrete below, and eliminate the step created by the plywood. The final product is displayed in Figures 11 and 12.



Figure 11: Side View of Completed Ramp



Figure 12: Front View of Completed Ramp

Reflection on Deliverables

The Son Care Foundation did not require anything to be submitted during the project. The only thing the nonprofit asked was to be consulted when it came to design decisions and if there were any issues that arose. The construction management student was expected to design the project, estimate and procure the materials needed, and build and install the project. Son Care provided the budget that was needed to purchase any thing used during construction. With the openness of the project the only deliverables for the project were the accessibility ramp, Parking lot fence, and the receipts from any purchases that were made. No formal documentation was required for any of these items so the project was closed with the reveal of the two structures. The receipts were then given to Son Care who then reimburse the student for anything that was purchased during the making of the projects.

The fence was the simpler of the two projects. That being said it, was not a simple task. A lack of experience and a feeling of overconfidence made for multiple mistakes that resulted in more than a few problems. The Fence is made of seven feet tall posts, fifteen feet long rails, and eight feet long rails. Each piece is made of vinyl. All the pieces connect together similar to a giant Lego set. After sitting in a field for so long the pieces needed a good wash, but once cleaned were shining like new. The placement of the fence required some debate as it would be somewhat permanent when the project was finished. Overall, the fence will do a wonderful job of keeping the parking lot separate from the field and help keep workers and customers safe.

The ADA access ramp was a beautiful addition to the entrance of the Son Care Foundation. The ramp is not so steep that it requires the use of the handrails and is sturdy enough to stand up to the years of use that lay before it. The sides of the ramps were colored green to match the underside of the porch that wraps around the office. To help the ramp blend with the color of the porch and also add some grip to the slippery plywood, a rustic red paint that was mixed with sand and painted on the top of the ramp. The last touch was the railings. While they were not needed it would have been unsafe to leave the edges exposed. The pressure treated wood was painted over with many layers of white paint so that they would blend in with the color of the office. The finished ramps do not look out of place even one bit and added to esthetic of the office.

During the first meeting it was decided that it would have been impractical to provide the student with a credit card for the duration of the senior project. It also did not make much sense to have Son Care order all the materials that were needed. An agreement was made that the student would purchase and transport the materials back to the ranch. When the projects were completed, the student would then be reimbursed for the total amount that was spent. Turning over the receipts to Son Care allowed the business to verify the money that had been spent and signified the completion of the senior project.

Lessons Learned

There were many lessons that were to be learned from this project. The biggest and most important was just how important project planning is. Most of the project was conducted with only the bare bones of a plan put in place. This lack of a solid plan led to many mistakes and issues that could have been avoided if the proper amount of time had been dedicated to this task. The most glaring of these issues was the lack of skill that was necessary to complete either of the structures. The student had a good amount of experience in rough carpentry and other rough means of building. However, they did not have very much experience with the finer points of finish carpentry. This meant that once a

problem arose it took much longer to solve than it probably should have. Taking the time to plan ahead would have allowed the student the chance to realize that they did not know how to do certain portions of the project. With this insight they would have been able to seek out somebody who had more knowledge on the subject and use that individual's knowledge and experience to avoid making mistakes or to help solve the more complex problems. The lack of planning also created problems beyond a lack of knowledge and experience. Not planning ahead meant that the original estimate left out much of the materials that were needed to put the projects together. Simple things like extra wood, epoxy and most of all screws were bought sparingly at first with the expectation of not needing very much. On multiple occasions work had to be stopped and more screws or an extra piece of wood had to be purchased from the local stores. If there had been more time dedicated to the planning of the project an immense amount of time and frustration could have been saved. The importance of planning ahead is a lesson that will never be forgotten.

Another large lesson that was learned during this project was that of unforeseen conditions. At the beginning of the project, it seemed as if the two projects would be relatively simple. Without the proper planning certain existing conditions were missed that, if caught, would have drastically changed how the project was handled. However, even if there had been more planning, conditions still existed that could not have been found until the project began. The biggest of the unforeseen conditions was that no part of the ADA access ramp was flat, level or straight. The slight misalignments of the different parts of the site made it so that each piece had to be crafted individually. Having to deal with conditions of this magnitude on the fly forced the student to keep a calm demeanor and find innovative solutions. By doing this they learned that no matter how difficult a problem was, a solution always existed, it just had to be found. Unforeseen circumstances are never the end of the world and can always be worked around. The ability to work around difficult circumstances on the fly by using the resources in the immediate vicinity is a skill that will be utilized for the rest of the student's life.

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