SLO City GaGa Pit

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This project included designing, constructing, and assembling a GaGa court, also known as a GaGa pit, for a local community church in San Luis Obispo. GaGa is a game similar to dodgeball where all the players are inside an octagonal court and try to hit each other with a rubber ball below the knees. The walls help keep the ball within the court and can be used to bounce the ball off of. Dimensional lumber was used to construct the walls as it is both durable and strong. The walls were also extensively sanded to prevent any sharp corners or splinters in order to maximize safety. The walls were finished with stain and then transported and assembled onsite at the church. One crucial design consideration was the ability for the court to be taken apart if needed and not a permanent structure. Another key design challenge was constructing a court that was strong enough to withstand play but light enough to be easily transported and set up. This project benefited the community by providing a fun outdoor recreational opportunity for kids. It also enriched my construction management skills by providing me with real-world construction and project management experience.

Key Words: GaGa Court, Construction project, Outdoor games, Playground, Project management

Introduction

After speaking with several community organizations about potential construction projects, I found that SLO City Church was looking to purchase a GaGa court for their youth ministry. They were originally looking at plastic and pre-made wood kits, but they were cost prohibitive. By working closely with the Youth Pastor, I was able to understand their vision and develop a design that would work best for their needs. One design challenge was they wanted a court that could be taken apart but also was durable and sturdy. Once we had an agreed upon design it had to be approved by their landlord. I was then able to procure all the materials, construct the pit, and assemble it at their site.
Background

When the idea of building a GaGa pit was initially proposed to me, I immediately knew it was the perfect senior project for me to undertake. I grew up attending camps with my dad and GaGa was always one of the most exciting games that would keep me entertained for hours. I wanted to create the same opportunity I had growing up of getting to spend time with friends outdoors and to have healthy competition. I knew this project would further enhance my construction management skills as this project required lots of communication with the owner, estimating, scheduling, and constructing. I also really wanted to contribute positively to my community and leave behind something that can be enjoyed for years to come.

Process

Design

The majority of preconstruction time was spent on determining and refining a design that would work best. GaGa courts come in a variety of sizes with varying wall lengths and heights. By working with the church, I was able to determine that using 8ft long walls, resulting in an octagon about 20 feet in diameter, would best fit their available space. I chose to build the walls on the taller end to help keep the ball in since the court would be near a parking lot. In addition, the opening was cut in one of the walls so kids could easily enter and exit the court. In order to make the court collapsible, hinges were used to attach all the walls so the pins could be removed. 2x10 and 2x6 dimensional lumber was used in order to create strong walls that kids can lean up against. Leaving 4” gaps between the horizontal planks also helped reduce weight making it easier to transport and assemble.

Estimate

This project was funded by the Construction Management Advisory Council, CMAC. I was able to estimate my costs after conducting a quantity take-off of my initial design. The only unexpected
additional costs were more sandpaper discs and 20d nails that were used in lieu of hinge pins. All of the materials were procured from Home Depot and the ball was from Dick’s Sporting Goods.

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**Schedule**

The entire project was estimated to take just under 18 days to complete. A majority of this time, 15 days, was spent in preconstruction determining the design and waiting for their landlord to approve the project. The construction was planned to take just under three days with a majority of the time being spent on cutting material and screwing together the eight walls. While the preconstruction duration went as planned, the construction schedule was extended due to an underestimate of the amount of time it would take to sand and stain the walls. I originally planned to do both the sanding and staining in one day, however both activities took about twice as long as expected. Due to how rough the wood was, I spent much more time sanding the walls smooth. The staining also took longer than expected as I forgot to include drying time between coats of stain in the schedule. Overall, the actual construction took about two days longer to complete than expected.
Pre-Task Plan

1. Tools needed: chop saw, jig saw, impact driver, orbital sander, tape measure, framing square, paint rollers
2. Means and Methods: Attach the horizontal 2x10s together with 2x6 vertical supports. Use four deck screws per connection. Use template blocks for spacing between horizontal 2x10s and for vertical support spacing. Measure and cut 36” angled opening. Sand and stain all walls. Attach walls together with utility hinges with removable pins.
3. Risks/Challenges: Walls not lining up due to improper spacing – use template blocks where possible. Poor material with cracks or splintered edges – pre-drill where needed.

Construction

After procuring all the materials I was ready to begin constructing the walls. The walls were preassembled at my house in order to eliminate many unknowns at the site such as power availability.
and noise concerns. The 2x6’s for vertical support were cut to 36” in height. Since two were required per wall, 16 of them were needed. The 2x12’s were procured in an 8’ length so they didn’t have to be cut. After spending a long time trying to get the 2x12 spacing just perfect, I decided template blocks could save lots of time. This also helped ensure that all the walls were the exact same. Template blocks were used to determine the distance between the horizontal and vertical boards.

**Assembly**

Star flat-head wood deck screws were used in order to attach the vertical supports as they provide the best corrosion resistance and are the strongest. After completing the first wall, seven more identical were built, that when put together will make up the octagon. Once the walls were completed, the nicest one was used to make the entrance. The angled opening in the wall was traced out and then cut. 3.5” of the second 2x12 was left in order to ensure structural integrity. This notch ended up being the perfect height as it is just high enough to prevent the ball from being hit out excessively but short enough for kids to be able to step over. A notch was chosen instead of building a gate as it allows kids to exit the court quickly which is vital as the game doesn’t stop when someone gets out. 1x4’s were then used to trim out both sides of the wall. These boards provide structural support as they help lock the wall all back together while creating a nice entrance.

**Sanding**
The next step was sanding all of the walls. An orbital sander was used to sand both the inside and outside of the walls. Special attention was paid to any sharp corners, and they were sanded round to prevent injury. 80 grit sandpaper was used where more material needed to be removed and 120 grit on all the surfaces to prepare it for stain. Due to the large amount of surface area that needed to be sanded, over 250 SF, I ended up using two sanders at once and worked in a methodical way down the length of the boards.

**Staining**

The next step was to stain the wall sections. Plastic sheeting was used in order to prevent contamination and spilling stain into the grass. A roller and an extension pole helped as I could remain standing. It took several hours for the stain to dry in order to flip them over to do the opposite side. Once the majority of the wall was stained, a brush was used to get in between the 2x12’s and the edges all the way around.

**Hinges**

Finally, each wall was lined up square to each other and utility hinges with removable pins were installed linking each wall segment to each other. Once the hinges were fastened, I removed the pins. Each wall was labeled with a letter assigning it an order due to the lack of play and precision required...
when lining up the hinges in order to assemble it. I then transported them to the site and assembled the walls by using trimmed 20d nails as the pins. These nails being slightly smaller in diameter than the original pins allowed for a little more flexibility when installing.

**Deliverables**

The deliverable in this project is one octagonal GaGa court which is approximately 20 feet across. This pit is very durable as it is built out of 2x dimensional lumber and should last 10+ years. One major consideration I satisfied through the use of hinges that the client requested is for it to be able to be taken apart and moved if needed. I also provided the client with a ball so it could be used right away.

**Lessons Learned**

I think the biggest lesson learned is the gross underestimate of how long it would take to complete each step of the process as there were so many walls. For example, I estimated it would take around two hours to sand the walls and it ended up taking over eight hours. The staining also took far longer than originally anticipated by several hours. I think this project gave me a better understanding of how long building something can actually take, especially when doing it by yourself, and will help me in the future make better predictions when scheduling. When it comes to construction, I think one thing that could have improved efficiency and quality would have been to build a square jig that I could have dropped the 2x10s into. This would have ensured each wall was square and would have eliminated the need to place the eight template blocks each time. While building the jig would have taken some extra material and time up front, it would have helped considerably during the construction of the walls.

**Conclusion**

This project enabled me to benefit a local community church while learning construction management and hand-on skills. Working with the client helped me refine my management skills as I had to communicate frequently in order to determine and confirm design intent and schedule the project. In addition, I had to estimate the project in order to confirm its feasibility. Finally, I had to procure the
material, construct, sand, stain, and assemble the walls. This real-world experience helped me better understand everything that goes into a project from conception to handing it over. This project was very rewarding as the client was super excited about the finished product and couldn’t wait to use it. They were also grateful for their design requests being implemented. I hope my project will provide kids with a fun outdoor activity for the foreseeable future and bring as much joy as possible.