SHABANG Music Festival Seating

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This outlines the process of the building and installation of four shaded seating areas at the SHABANG Music Festival located at Laguna Lake Park in San Luis Obispo. This paper places an emphasis on the pre-construction elements of the building stage. SHABANG Music Group rented out a section of Laguna Lake Park to host a music festival designed to bring the San Luis Obispo community together. The goal of the project discussed was to build a raised VIP seating area facing the main stage on which music lovers could relax while still being able to enjoy an unobstructed view of the main stage. The preconstruction for the project was completed by the build team, with volunteers being recruited for the installation phase. Pre-construction focused on coordinating with the SHABANG design team, obtaining/planning materials in relation to the schematic design, planning site building elements, and pre-fabrication. Seating units were to be constructed off site before being broken down and shipped to the music festival grounds. This paper covers the entire building and installation process with a primary focus on pre-construction elements. The most important element being off site prefabrication of seating units.

Key Words: Preconstruction, Prefabrication, Seating, SHABANG, Design

Background

SHABANG Music Festival is hosted in Laguna Lake Park, otherwise known as the Laguna Lake Natural Reserve. This park is approximately 344 acres and boasts miles of walking trails, an open fence dog park, and even 18 holes of frisbee golf. The objective of the park is to provide opportunities and experiences for the SLO community. SHABANG has been renting out a subsection of this park for many years to create a festival for all those wishing to attend. The SHABANG build team reached out to Cal Poly Construction Management students in search of a few people to help design and build small experiences within the festival. With most other projects already underway, they still needed a raised seating area with a clear view of the stage. The vision was to build raised seats with a view of the stage to accommodate for upwards of thirty people at a time. Once the criteria and design were understood the pre-construction phase began.

Design

Site Plan

The site plan (Figure 1) is the first and most important drawing when it comes to mapping out festival spaces. The specific area and land usage must be decided to ensure the working design can fit within the space allotted. In working with the design team, it was decided the area would fit up to 120 people, with adequate raised seating for thirty. From there dimensions for the area were taken. This area was based on spacing of a 4’ diameter per person. Based on these dimensions the seating area was placed onto the site map and the location was finalized.

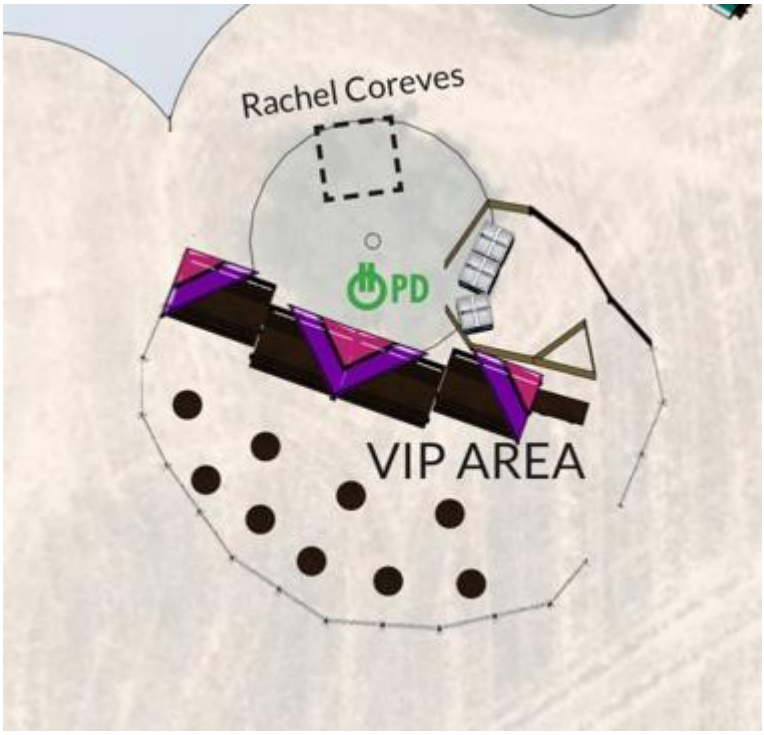

Figure 1: Site Plan

Working Design

Once the Site plan was decided, the working design was established. Taking inventory of the wood already on-site and communicating with the design team helped shape the final design. In the end, four large decks were to be built with benches placed on top and shade canopies behind them. It was a mix of multiple ideas that all came together to create the final product. After this design was decided, the SHABANG design team modeled the space in Sketchup. They created a to-scale model, that made the final design easy to visualize.

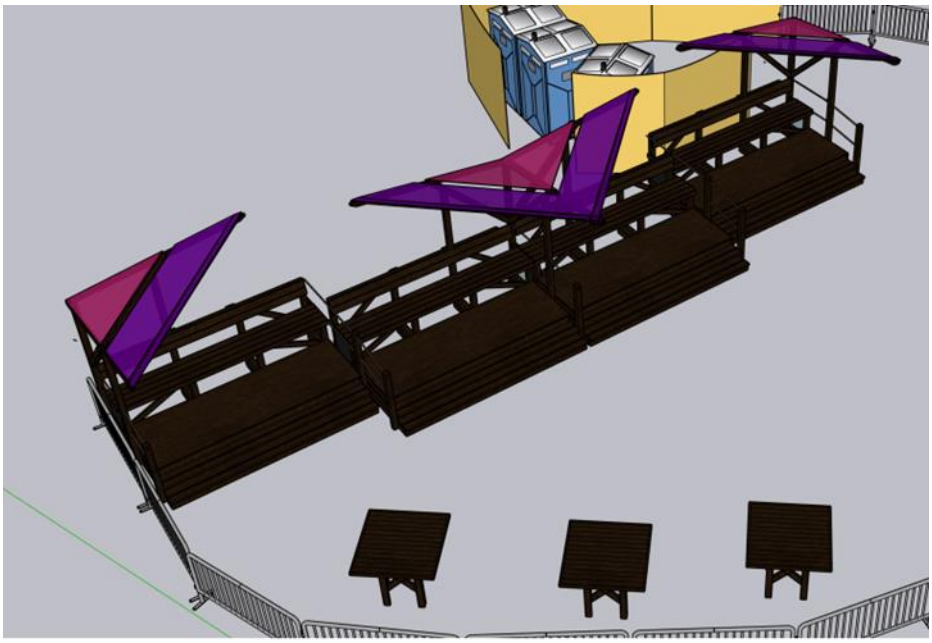

Figure 2: Working Design

Preconstruction

After three months of back-and-forth discussions, the final design was approved. This design period left less than a month for the entirety of the project to be built. Because Laguna Lake is a public park no building materials or preconstructed elements could be stored within park grounds. SHABANG rented a building yard 25 miles from the site to prep all the materials needed to have the site ready in a matter of days. The necessity of making sure all structures on-site could be completely erected with little to no problems, in just a matter of days, is what made the preconstruction and prefabrication process so important to this project.

Quantity Takeoff / Cost Estimate

The first step in ensuring all four separate seating units were created with little to no discrepancies was to create a takeoff of all the wood being used to build each unit. The Sketchup model was broken apart into four main categories to accurately denote the material and length that would be needed. These categories were: Piece A: Foundation, Piece B: Deck, Piece C: Bench, Piece D: Canopy (Figure 3). Accurately pulling the measurements and lengths from these specific pieces allowed for a much faster and more efficient building process, saving not only time, but material cost as well (Figure 4). A general cost estimate was also created and attached to the takeoff in order to inform the festival investors as to the cost of the project.

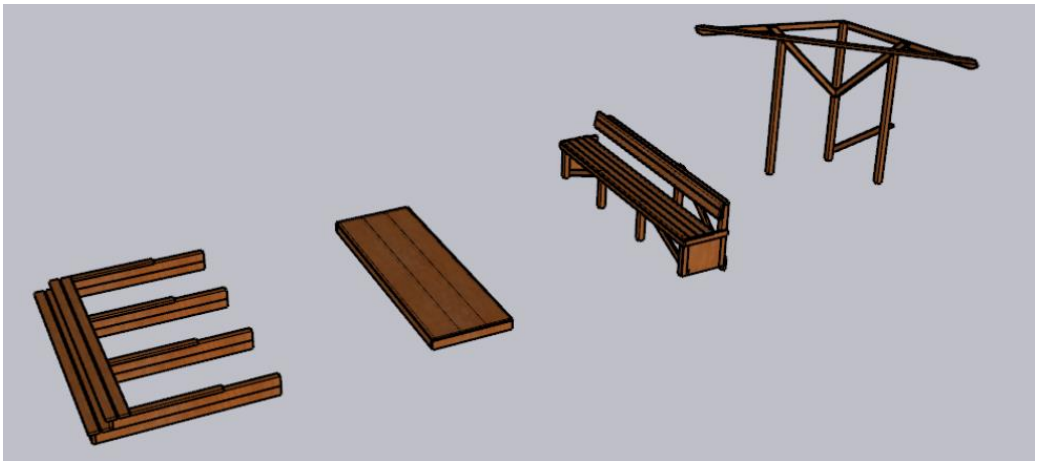

Figure 3: Exploded Sketchup Model

SHABANG VIP TAKEOFF

Piece A: Foundation

Description	Unit	Length	QTY	Unit Cost	Estimate
Steps	6x2	12'	4	$21.00	$84.00
Front Baseboard	6x2	12'	2	$21.00	$42.00
Top Plates	2x4	4'	2	$6.48	$12.96
Back Plate	2x4	12'	1	$22.98	$22.98
Bottum Foundation Beams	4x6	8'	4	$27.00	$108.00
Top Foundation Beams	4x6	7'-3"	4	$27.00	$108.00
				Foundation Price:	$377.94

Piece B: Deck

Description	Unit	Length	QTY	Unit Cost	Estimate
Joists	6x2	11'-9"	4	$21.00	$84.00
(Top) Plates	2x4	4'	2	$6.48	$12.96
End Blocks	6x2	4'	2	$7.58	$15.16
Sheathing	3/4"	4'x12'	1	$121.47	$121.47
				Deck Price:	$233.59

Piece C: Bench

Description	Unit	Length	QTY	Unit Cost	Estimate
Front Legs	4x4	2'-3/4"	4		$0.00
(Middle + Back) Joists	2x4	12'	2	$22.98	$45.96
Front Joist	2x4	12'-3"	1	$22.98	$22.98
Front Cross Braces	2x4	4'-7 1/8"	2	$6.32	$12.64
Back Cross Braces	2x4	5'-9 1/2 (5'-8 3/4")	2	$6.32	$12.64
Back Legs	4x4	3'-5 1/2"	2	Using Scrap	$0.00
Top Back Bench Joist	2x4	11'-4"	1	$22.98	$22.98
Bottum Back Bench Joist	2x4	3'-7 3/8"	3	$5.98	$17.94
Grooved Wood Seating	3/4"	1'10" x 12'-3"	1	On Site	$0.00
Grooved Wood Seat Back	3/4"	10 3/4" x 12'-3"	1	On Site	$0.00
				Bench Price:	$135.14

Piece D: Canopy

Description	Unit	Length	QTY	Unit Cost	Estimate
Small Supports	4x4	8'-2 1/2"	2	$27.22	$54.44
Main Support	4x4	8'-5 1/2"	1	$27.22	$27.22
Cross Brace	4x4	7'-1 1/16'	2	$27.22	$54.44
Outward Support	2x4	10' 1 1/8"	2	$22.98	$45.96
Top Diagnol	2x4	14'-1 3/4	1	$22.98	$22.98
				Canopy Price:	$205.04

Total Pricing

Description	Cost Per Unit	QTY	Total Price
Full Seating Unit	$951.71	4	$3,806.84

Figure 4: Takeoff and Estimate

Schedule

The schedule for this project was put together in relation to completion dates that had to be met. Originally the schedule discussed with the design team had prefabrication starting March 1st. However, after some design changes and setbacks, the final design was not approved until April 13th leaving just four weekends until construction on site needed to begin. By working diligently and using materials already on-site, I was able to collapse the schedule to meet the needs of the SHABANG team. A formal construction schedule could not be developed due to several design and material procurement elements.

Prefabrication

Upon arriving on-site, the design team informed the build team that each of the four units could be shipped out in two major pieces, the decks with benches on them, and the canopies. However, it was discovered upon building this would not be the case. Due to the sheer size and weight of the units they would need to be broken down into sub pieces and placed together on site. This was a challenge as it was originally planned to troubleshoot any design issues upon building each individual unit in the pre-construction phase. The problem was tackled by deciding only 1 full unit with its canopy would be erected on the build site. From there, field measurements would be taken off the erected unit and used as the base measurements for creating the remaining units.

Prefabrication began by cutting wood on-site to match the specifications of the design documents. The first step was gathering the wood thrown around the site and ensuring there was enough to build a full unit. On April 17th construction commenced. Foundations were cut, frames for the decking were assembled, and sheathing was cut to size. In cutting the wood, notes were taken of needed materials and multiple supply runs had to be completed to ensure all necessary wood for the Mockup was on site. The following week the first unit was assembled as a type of rough draft (Figure 5) and the design team made their final comments on potential modifications or additions to the final product. Comments on new connection joints and lengths of foundations were added and the final design was decided upon.

With the final design and measurements locked in, the next step was cutting all the wood to size. True measurements were pulled from the mockup and all remaining pieces for the three units were put into bundles to ensure they stayed together. Only certain pieces could be put together at this time because of restraints placed on us by the shipping company and the weight of the units. Pieces such as foundation blocks, half of the canopies, benches, and wood frames, were all built, but not attached to one another to ensure everything could fit in the back of trucks. This system of prefabricating certain wood pieces and ensuring free floating pieces were cut to their exact size, helped reduce overall setup time on site by two days.

Figure 5: Seating Unit Mockup

Construction

On-site construction began five days before the festival began. To make sure everything was built before the start of the festival the build team was given four full days to erect and set up all the structures. During day one, bundles of wood were taken from trucks and brought to the specific area designated on the site map. All necessary wood pieces were laid out next to their specific units and building began.

Specific Construction

The Units were built as follows. Three separate pairs of 4x6 pieces of wood were connected through metal plates. These foundation pieces were then stood up to create three long beams that the deck would rest on top of. The distance between the three foundation pieces were determined by the distance between the legs of each specific bench. After aligning the foundations, the stairs were drilled in to lock the pieces in place (Figure 6). Following the stairs, the decks were placed on top of the foundation and covered with plywood sheathing (Figure 7). This was the main component of the build, and the sheer weight and size were the reason it could not be completely built off-site. After constructing the decks, a bench was lifted onto the top of the deck and locked in by wood and metal brackets (Figure 8). When this unit was fully completed, we slid it into its designated spot noted on the site map and moved to the next. Finally, we erected the canopies. With half the canopy being prefabricated (Figure 9), they were quite simple to put up. Half of the frame would be leaned up and all connected pieces would be attached to the opposite side to complete the construction.

Figure 6: Foundation with Stairs

Figure 7: Deck without Sheathing

Figure 8: Seating Unit

Figure 9: Prefabricated Canopies

Lessons Learned

This project taught the team, in-depth, about proper communication and the necessity to complete work on time. There were many portions of the project where work was put off, impacting the overall completion of the project. This led to arguments and made building the actual booths very stressful, especially as the deadline approached quickly during the last few weekends. It is essential to have an agenda for meetings and clearly write out your expectations to make sure everyone stays on track and on task. If this was done effectively from the start of the project, we could have had a perfected "to-scale" design put together, saving time and money in the final product.

A major lesson learned while building is that you may not be able to anticipate what is going to go wrong, but you must be ready to adapt. It seemed that everything that could have gone wrong did go wrong. From the materials we were using being extremely warped, to the prefabricated canopies being knocked out of level while shipping, and even certain materials going missing upon moving. There seemed to be a small problem with each step of the building process, especially in prefabrication. However, by thinking critically and dealing with these problems as they arose, the team was able to create comprehensive solutions to resolve each of the issues. This lesson learned in the prefabrication stage was essential in making sure the booths were built correctly and in a timely manner on the build site.

Conclusion

In conclusion, all the specifications for the seating were met, the units were built on time, and the SHABANG team loved the finished project (Figure 10, 11). It was a lot of work over the final month before SHABANG, but overall, it was worth it. With the help of the design team, build team, and SHABANG sponsors, an amazing festival experience was delivered that accomplished all the goals we set out to meet. On top of this, the design can easily be deconstructed and used for years to come. Creating a project that brought joy to festival-goers and will be used again and again means this project was a success (Figure 12).

Figure 10: Wood Seating Structures with Canopies

Figure 11: Wood Seating Structures with Covered Canopys

Figure 12: Building the Units