The Emma Family Backyard Deck – Thousand Oaks, CA

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This paper outlines the planning, design, and construction of an 80 square foot deck/outdoor patio. The main purpose of this project was to assist an elder couple fund and construct a new deck in their backyard. Due to the current world pandemic, COVID-19 the Emma Family was practicing social distancing and adhering to the State and County wide stay at home order. The project plan was to design a deck for Emma family in the design, construction it and receive funding. The deck was a rectangular 8' x 10' and raised 6" off the ground. In addition to the deck the project also consisted of a removable housing unit for the main sprinkler and water line. This paper will focus on the preconstruction phase, construction phase, lessons learned, and how this knowledge will be applied to the construction industry.

Key Words: Deck, Patio, Backyard, Construction, Trex

Background

This project is located at the Emma Family residence in Thousand Oaks, CA. The Emma Family is an elder couple Donna and Jim who have a son James, who does not currently reside with them. Donna and Jim were sentenced to practice safe social distancing and to follow the stay at home order emplaced by California Governor Newsom.

After sitting down and having the first meeting the Emma Family expressed their need for a deck and housing unit for their water line that was within a reasonable budget, could last for many years with minimal maintenance and for it to cover a majority of open and unutilized space in their backyard. The projects intent was to follow all of their guidelines. Quickly following the meeting, a sketch of multiple different designs was completed and there was an agreement on a rectangular 8' x 10' design that covered the entirety of the open space.

Throughout the project, all questions and concerns were direct to two reliable construction resources: Tony Greer with OrganizeIt and Steven Blum with MATT Construction.

The project team had a majority of tools needed, however there were a few specific times that were generously donated to the team though Tony Greer and OrganizeIt. These tools included a dirt tamper, 78" level, Skilsaw, and chopsaw. With the addition of these tools I was able to complete all construction correctly and in a timely manner.

Preconstruction

Proceeding the first meeting with the Emma Family work on designing, estimating, and scheduling out the deck project began. After further discussion it was determined that the project would consist of an 80 square foot rectangular deck in addition to a removable housing unit for the sprinkler and water main line and valves.

The first main step in the preconstruction process was the funding needed to complete the project. $1,000 was donated for the construction and materials of the project. Donna and Jim's son James agreed to match all donations with one of his own. From 3rd party friends and family $500 was raised and James donated the same amount of $500.

After all donations were received, a schedule for the project was created. The schedule included the projects major milestones; grading and leveling the ground, framing beginning and completing, and decking beginning and completed. The agreed upon completion date was June 1, 2020.

Construction

Grading and Framing

Construction began on April 23rd, 2020 with the leveling of the 90 square foot dirt patch in the yard. To complete this as efficiently as possible the area had to be to be cleared of all large debris in order to have uninterrupted work area. Then came the removal of the soil from any visible high points of the yard and spread it in holes and low-lying areas. Following, was the smoothing of all areas with a hard metal rake to create the final grade. After checking and confirming the level of the yard a hand soil tamper was used to create a feasible work area.

On April 24th, 2020 was the beginning of measuring and laying out the twenty 7-in x 11-in x 11-in concrete deck blocks (See Figure 1-1) for the foundation. Each block was recessed 5 inches in the ground leaving 2 inches to have a total elevation for the finished deck at 6 inches. After all concrete blocks were level, the project move forward to cutting and laying the redwood foundation. The foundation was constructed out of 2" x 6" x 16' treated redwood lumber. The lumber was connected at each block with 1½" 9-gauge galvanized exterior nails. I then emplaced joists utilizing 2" x 6" joist hangers.

Water Line Housing Unit

Over the course of the next three days the framing of the deck foundation was completed. Then was the framing of the removable housing unit for the water and sprinkler lines/valves. The main goal of

the housing unit was to construct a box that was able to cover the water lines and still flow with the design of the deck. The housing unit frame was constructed out of treated redwood 2" x 4". The exterior of the unit was finished with the same Trex decking as the deck. The housing unit can easily be removed by lifting directly up. This feature was added to hide the water lines but still have them accessible if access is needed. The housing unit is sturdy enough to act as a bench for the Emma Family.

Decking and Finishes

After a meeting with Donna and Jim it was determined that the top decking would be constructed out of Trex, a wood composite. They chose Trex over a natural wood finish with a satin or paint due to its expected lifetime and ease of maintenance. 1" x 5.4" x 8' sections of boards were purchased which made the instillation easier due to less cuts. The Trex decking is was anchored with 2½" decking screws 16" on center. The decking ran horizontal to the house in order to make it visually pleasing. There is a 1/8-inch gap between each Trex board to allow for drainage. The process of laying all the final decking was completed in one work day.

Deliverables

The final deliverable has been delivered to the client before the agreed upon completion date of June 1, 2020. The 80 square foot space includes the low maintenance deck and removable housing unit for the water lines. On May 21th, the project was unveiled to the Emma Family. On June 5th a BBQ was held in backyard of the Emma Residence to celebrate the completion of the project. The deliverables also include a full budget, schedule, and 3D design.

Design

During the design phase three different sketches were created for Donna and Jim. All were similar in shape however one had a higher elevation and one had an extra step included for the entrance of the deck. The Emma Family agreed it would be most visually appealing and easy to access with a low elevation and not step included. This design was then sketched up on a computer in order to generate a 3D design. After the Emma family reviewed the design construction was able to proceed.

Budget

The overall budget for the project was $1,004.84. The 2 x 6 x 16 treated redwood cost $17.98 per board and eight boards were purchased for a total of $143.84. The 2 x 6 x 12 treated redwood cost $12.03 per board and with four total boards the total was $48.12. Each 2 x 4 x 8 was $5.88 and with six boards the total was $35.28. Thirty-two Trex decking boards were purchased at $16.18 per board for a total of $517.76. The thirty joist hangers cost $25.40. The joist hanger nails cost $4.98 per one-pound box. Five boxes were purchased for a total of $24.90. #10 exterior wood screws were used, and they cost $26.98 per package. Three packages were purchased for a total of $80.94. The twenty concrete deck blocks cost $128.60.

Item	Size	# of Units	Cost Per Unit	Total Cost
Treated Redwood	2 x 6 x 16	8	$17.98	$143.84
	2 x 6 x 12	4	$12.03	$48.12
	2 x 4 x 8	6	$5.88	$35.28
Trex Decking	1 x 5.6 x 8	32	$16.18	$517.76
Joist Hangers	2 x 6	20	$0.88	$17.60
	2 x 4	10	$0.78	$7.80
Joist Hanger Nails	Joist Hanger Nails	5	$4.98	$24.90
Wood Decking Screws	#10 x 3 1/2	3	$26.98	$80.94
Concrete Deck Blocks	7 x 11 x 11	20	$6.43	$128.60
TOTAL COST				**$1,004.84**

Schedule

The schedule for the project had a duration of 31 days beginning on April 20, 2020 and finishing June 01, 2020. Preconstruction was from April 20, 2020 to May 04, 2020. Construction of the deck was from May 05, 2020 to June 01, 2020. Construction of the housing unit was from May 27, 2020 to May 29, 2020. The project schedule is as follows:

- Preconstruction
    - Design Deck: 20 April – 24 April
    - Design Housing Unit: 20 April – 24 April
    - Measurements: 27 April – 28 April
    - Project Cost Estimate: 29 April – 04 May
- Deck Construction
    - Excavate: 05 May – 06 May
    - Level and Tamper: 07 May – 08 May
    - Material Pick Up/Layout: 11 May – 11 May
    - Concrete Deck Foundation: 12 May – 14 May
    - Frame Foundation: 15 May – 20 May
    - Add Joists: 21 May – 25 May
    - Finish Framing: 26 May – 26 May
    - Lay Trex Decking: 27 May – 29 May
    - Install Façade Board: 01 June – 01 June
- Housing Unit Construction
    - Material Pick Up/Layout: 27 May – 27 May
    - Rough Framing: 28 May – 28 May
    - Finish Framing: 29 May- 29 May

Appendix & Figures

Figure 1-1: 7-in x 11-in x 11-in concrete deck block

Area Prior to Construction

Leveling Ground

Laying Concrete Decking Blocks

Framing Beginning

Framing Continue

Joist Hanger Connection

Connection at Concrete Deck Block

Framing Continue

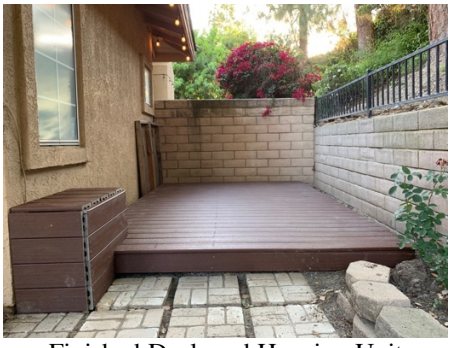
Framing Complete

Framing Removable Housing Structure

Laying Composite Decking

Finished Deck

Finished Water Line Housing Unit



Finished Deck and Housing Unit

Lessons Learned

The lessons learned throughout this project were valuable and will stick with the author throughout his career. The key lesson and take away learned through this project were how important the preconstruction and planning phase of a project are. By sitting down and taking the extra time to design the deck and figure out all required building materials before construction started, the author was able to estimate the project and amount of building materials needed. Being able to think one step ahead of the construction process is a great to keep a project on schedule. Another lesson learned was to ask questions. There is an abundance of knowledge in the construction industry. From online resources to peers who are in the industry it is hard not to find the answer to a question. Always make sure to speak with others to gain multiple options about methods and solutions to problems. By speaking with others, one is able to see construction with through many different eyes and although each is different there are great points and methods you can pull from each of them.

Knowledge

All things considered, this senior project provided the author with numerous lessons and a valuable experience that will be able to be carried throughout his construction career. Understanding the importance of preconstruction and planning and the evolution of a project in order to provide the best possible results are extremely important.

This project showed construction from both a field and office standpoint. There was the ability to gain appreciation for tradesman, project engineers and managers, as well as superintendents. Wearing all kinds of different hats and having all responsibilities is something to be grateful for. With a better understanding in what it takes to complete a project from preconstruction to project completion. The author is thankful for the opportunity present and will carry the knowledge gained throughout a construction career.