Paso Robles Police Department Outdoor Training Facility Improvements

Nicolas Petri
California Polytechnic State University
San Luis Obispo, CA

This paper will outline the pre-construction and construction processes of the Paso Robles Police Department’s outdoor training facility improvements. The project, located in East Paso Robles, focuses on 12,000 square feet of a 24,300 square foot site owned by the city of Paso Robles. This is a group project done with Gavin Abraham and Zach Stellini that remodeled an existing outdoor training facility, including over 1400 square feet of concrete flatwork, underground utilities, 80 cubic yards of decomposed granite and various site civil improvements. The purpose of this project was to provide the Paso Robles Police Department with a cleaner and more functional facility that allows its officers to be better equipped to protect the community.

Key Words: Site Improvement, Grading, Excavation, Concrete, Flatwork

Introduction

This project revolved around the renovation and construction of the Paso Robles Police Department’s (PRPD) training facility in Paso Robles, CA. The training facility is primarily used for firearm training and testing, and was originally a vacant piece of land sitting between three surrounding hill barriers. The project was a remodel of an existing outdoor training facility, including over 1400 SF of concrete flatwork, underground utilities, 80 yards of decorative DG and various site civil improvements. Our main goals were to transform the existing facility into what is not only an effective training tool, but also a place that police officers enjoy visiting, and to provide the Paso Robles Police Department with a modern, functional facility that allows its officers to be properly equipped to protect the community. The team consisted of four students: Gavin Abraham, Nic Petri, Zach Stellini, and Cole Berkeland. We spent roughly 400 man hours each, free of charge, to complete the project and were able to finish in roughly 4 months. Funding for the project was provided by the PRPD and City of Paso Robles with material and equipment discounts from Alliance Concrete, CalPortland and Quinn Cat. This project was also made possible by tool, equipment and time donations from Dan Knight and Mike Bridgman. The following information will outline the process.
(preconstruction and construction) we went through, including deliverables from the project and lessons learned from each phase of the project.

**Process**

**Preconstruction**

The preconstruction process lasted about two months beginning in November of 2020 and ending towards the end of January 2021. At the beginning of the preconstruction process a group of Cal Poly Industrial Manufacturing Engineering (IME) students reached out to the Cal Poly Construction Management (CM) department in search of CM students that were willing to see their project through fruition. Originally, the IME students project consisted of two different propositions: a new indoor training facility or improvements to the existing facility. After meeting with the IME students, the project members (Gavin Abraham, Nic Petri and Zach Stellini), reached out to Commander Caleb Davis of the PRPD. The meetings concluded that the indoor training facility was not a feasible option for neither the department or the project. The option that suited both parties best was to make improvements to the existing outdoor facility. After coming to an agreement on the scope of work with Commander Caleb Davis and Sargent Josh Hermanson, we put together a proposal including plans, a schedule and estimate (see below for estimate data). The proposal was then sent for approval by Cal Poly faculty and the City of Paso Robles. Following a few meetings with Cal Poly faculty and the City of Paso Robles, we received approval to begin work on the PRPD training facility. With funding for the project provided by the PRPD and City of Paso Robles the project was set to begin with the work was to be split up amongst three phases: earthwork, flatwork and finishes.

**Construction**

**Layout**

Once we were completed with the preconstruction process the next step was to begin layout. Due to the fact that site had not been surveyed there weren’t control points or elevations to go off of. However, at the direction PRPD, we used the target line that is secured in an existing concrete walkway as our zero line to base our layout off of. We also realized that a zero yard walk way was redundant of the existing walkway that the targets are mounted to, so with the approval of the PRPD we decided to place a curb rather than a 4 foot walkway to save material. With use a 200’ measuring tape we were able to establish our 4 control corners to base the rest of our lay out on. From here we placed several stakes and ran string lines to utilize marking paint for the excavation of the sidewalks. However, before we were able to start digging we needed to figure out how much to dig. We used a surveying sloping laser loaned us by Mike Bridgman to figure how deep we needed to excavate to allow for 4” of base rock, 4” of concrete, and allow for a 2” of dg infill. We originally wanted to place turf in the front 3 bays (figure B) to create a nicer surface to lay on, but due to cost and longevity the PRPD decided to have dg placed in all bays.

**Earthwork**

Earthwork started around the beginning of February and began with scheduling for our equipment to arrive. We rented a mini excavator, track loader, two vibra-plate compactors and a water truck from Quinn Cat in Paso Robles. Using the rotating sloping laser, the process consisted of one man on the mini excavating the footings while one stood with the receiving rod to check for depth which was 8’’
below top of concrete to account for 4” of Class II base rock and a 4” sidewalk. The other men worked with the track loader and shovels moving and spreading the base rock into the footings. We put the base rock down in two 2” layers, soaking with the water truck and then compacting with either the vibra-plate compactor or the vibrating roller compactor. After two layers were placed and compacted we checked our elevation and cut or filled where we needed to. We would soak the base rock once more before we left for the day for the base to settle. This process was repeated over the duration of the project until every footing was completed.

Concrete

Subsequent to the earthwork, we would form and pour what was ready. The concrete process began with first acquiring all of the materials. After procuring the materials we began by setting up batter boards on either side of each walkway. Assuring their location and elevation, we set up the string lines for the inside edge of the 2x4s. If the string spanned longer than 40’ we put an intermediate stake to prevent the string line from sagging. Through a very monotonous and excruciating never ending task we hammered in over 2,000 linear feet of forms. We originally were using wood stakes but found that with the compacted base rock, they would split and caused frustration. Luckily we were able to find over 300 metal stakes from local concrete contractors to borrow that made the task easier and more efficient. Once forming was completed we installed electrical conduit with junction boxes in the concrete so that the PRPD could fish electrical wire through for lights in the future. For the majority of the project, we used welded wire fabric, lapped 8”, and raised on dobie blocks for our steel reinforcement. On the 50 and 100 yard walkways the PRPD asked us to use rebar as they would be driving over them for certain training procedures. We used #4 rebar spaced in a 1’x1’ grid. Once we were ready for concrete, we called and planned for our truck to come a little over a week before. The concrete was poured over three different phases due to the shortage of labor and skill versus the mass quantity of concrete needing to be poured. On our pour days, we were lucky to receive help from off duty police officers, their families, Dan Knight, and friends of our from Cal Poly that were willing to help and eager to learn. Luckily, our advisor Dan Knight graciously allowed us to borrow his arsenal of finishing tools that allowed for us to refrain from purchasing any. Although we were not professionals, and we made some finishing mistakes along the way, the concrete came out adequate and we were pleased with the results.

Landscaping

After completion of the concrete, we removed the formwork and began placing the decomposed granite. To do this we used a skid steer and vibratory roller compactor. In addition to placing the decomposed granite, we assured that the site grading surrounding the training facility would not drain onto the site. As a final touch, we placed and compacted asphalt grindings as a driveway and to prevent flooding and mud build up for their cars.

Conclusion

Lessons Learned

As does any project, there were many learning experiences throughout this project. Initially, our first mistake was attempting to calculate our elevations for cut and fill using a string line for a 12,000 SF site. We found that the string line, no matter how tight, would sag and hinder our elevations. To solve this problem we sought out a total station and rotating sloping laser level to assure our layout was
correct and our elevations were accurate. In addition, we found that buying cheap concrete does not mean sufficient concrete. To cut our cost, on our second pour we purchased our concrete with a steep discount, only to find that our concrete set-up too quickly with not enough labor to finish it properly in time. Another side note was to use metal stakes inside of wood stakes, when available. The metal stakes, with a smaller diameter, would hit in easily without splitting. The last lesson learned has to be the overall size of the project. Tacking on something this big didn’t outweigh our excitement when beginning the project. With only three members on the senior project team, we found ourselves constantly stressed and over worked.

Final Thoughts

Although this project was more than expected, it was an incredible learning experience. Spending countless hours to complete a target goal and making relationships on the way is something I will not take for granted. We really embodied the Cal Poly ideal “Learn By Doing” and I feel as though I am ending my college career content and full with knowledge and experience. A big thank you to everyone that helped, donated materials or donated time on this project as it could not have been done without them.

Photos

In Chronological Order

*Figure A – Existing Conditions*
Figure D – First Pour Complete

Figure E – Second Phase Forming
Figure F – Second Pour Underway

Figure G – Second Pour Complete
Figure H – Third Pour Complete, DG Placement

Figure I – Final Product
Figure J – Final Product, PRPD Badge

Figure K – Project Team (left to right) Srgt. Josh Hermanson, Gavin Abraham, Nic Petri, Dan Knight, Cole Berkeland, Commander Caleb Davis, Zach Stellini (not pictured)