



Case Study on Student Competence in Construction Surveying and Layout

Dejah Hilliard, CM

California Polytechnic State University San Luis Obispo

Leica
Total Station



“I like the self-performed jobs just because we have a lot of control of the work, which essentially affects the overall schedule and budget/cost.”

-Superintendent

“With our Field Engineer Bootcamp and staff on the jobsites that have gone through Bootcamp, the need for college courses of surveying is not required but obviously it would be helpful.”

-Field Engineer

Abstract

The demand for college graduates who have surveying knowledge sufficient for construction layout is increasing as more large companies are self-performing work. The Cal Poly San Luis Obispo CM curriculum requires a course that educates students on field surveying using a total station. The course does touch on procedures and tips to minimize error, however it does not spend a great deal of time explaining how to correct errors already made. The course is also limited to calculating data resulting from preset benchmarks, whereas CM students need experience creating points, lines, and new benchmarks. With the increased amount of self-perform work, new-hires, or college graduates prepare the layout. Although these companies do take the time out to teach their new-hires how to use said equipment, the jobsite would be much more productive if students graduated with this knowledge. The Cal Poly CM curriculum would significantly benefit from a course that focused on jobsite surveying utilizing updated equipment with a section dedicated to identifying errors and correcting them during the layout process.

Methodology

- Perform a case study on a project that uses surveying equipment
- Interview the leading superintendent and field engineer
- Analyze the importance of surveying knowledge on self-perform jobs
- Apply this knowledge to the CM curriculum at Cal Poly

Trimble M1
Optical Plummet
and
Target Prism



Case Study

- Contract: Design-Build
- Size: 170,000 sf, 7-story hospital tower
- Self-performance: 2 labor crews, 1 carpenter crew
- Layout: grid lines, columns, mat boundaries
- Equipment: 2 Total Stations, Trimble Optical Plummet with a target prism

Conclusion

- Self-perform allows for decreased cost and increased quality control
- Surveying knowledge is essential to college graduates
- Cal Poly CM could further prepare us for jobsite layout
- CM surveying course should use both a Total Station and a Trimble

