

Case Study: Laborer Safety Training for Small to Mid Sized General Contractors

Shawn Kuehter

California Polytechnic University

San Luis Obispo, CA

Abstract

The purpose of this study is to determine a relationship between safety spending and the resulting safety records for small to mid sized construction companies, particularly general contractors, and build on existing safety practices. It will shed light on why safety spending in construction is a very important aspect to include in any company's budget. A case study of Quiring General, LLC, a small to mid sized general contractor based out of Fresno, CA will be the core of this paper as it includes examples of injuries of laborers and their impact they have. The impact focused on in this paper is limited to replacement of crewmembers after an injury has taken place. Consequently, the results will be a conservative estimate. An analysis of several scenarios are used to determine how much Quiring should increase their safety training spending on their laborers. The results showed that an increase of 15% to 25% would be most reasonable.

Key words/Phrases: small to mid sized, general contractor, safety spending, case study, laborers.

Introduction

OSHA has claimed, historically, that the construction industry is one of the most dangerous occupations in the US and in 2015 claimed 937 lives, that is 21.4% of all workplace fatalities in the US. In addition to people actually getting hurt on the job, there are financial hurts to the company responsible for the hurt employee. Safety in the construction industry is paramount – meaning research into best practices for safety is a significant venture. OSHA commits to this ideal as they inspect construction sites constantly throughout the US. “Federal OSHA conducts about 22,000 construction inspections each year, which covers about half the states. State OSHA programs, which cover the rest, perform about 27,000 construction inspections each year. Thus, 50,000 construction inspections take place each year.” (Schneider) This data is from a study in 1997 so it most definitely has increased in the last 20 years. Safety is a very serious situation to OSHA, it is why they exist after all, and should be the same for general contractors, as well as other construction companies. There are direct and indirect costs associated with a workplace injury. Direct costs being workers' compensation, medical expenses and legal services if necessary. Indirect costs could be hiring a new employee to replace the injured one, corrective measures throughout the company if the injury was severe enough to

warrant a major change, all resulting in lost productivity. Indirect costs could be as high as 20 times the direct costs according to The American Society of Safety Engineers (ASSE). These costs are sometimes easily calculated and are felt right away, but some, like lost productivity, and lower worker morale is more difficult to measure. If the consequence of lost productivity and direct and indirect costs are not enough, the penalty for a serious OSHA violation has increased from \$7,000 to \$12,744 in effect August 1 2016. For repeat and/or willful violators, the maximum penalty increased from \$70,000 to \$125,438. (Whitlock)

This paper includes actual budgets and a case study example of injuries from Quiring General, LLC based out of the central valley of California. The information provided by Quiring can provide a good baseline for small to mid sized general contractors and similar construction companies looking to improve their safety practices. A little more background on them is that they work on OSHPD, assisted living and a little bit of corporate work. The injury examples that Quiring provided will serve as examples of injuries that resulted in lost productivity and other negative consequences. Taking a closer look at this budget and examples of injuries that result in costs could provide conclusions about what should be improved in small to mid sized general contractor companies.

Methodology

The majority of literature used in this paper draws from the Bureau of Labor Statistics (BLS), US Department of Labor (OSHA), and information provided by Quiring General, LLC. (Kliewer). The case study included in this paper will be quantitative in nature. Data from Quiring will be analyzed and compared to different scenarios to come up with a solution to better safety practices. Quiring provided information about the rough cost of training new salaried employees in the first year of employment; however, the numbers provided are not broken down into categories such as safety, jobsite tasks, etc. These numbers can be found in the appendix of this paper. Conversely, more precise estimates of the cost of training a laborer in safety. This number is approximately \$1,000 per year. In light of this, it would be wisest to focus on laborers as the information provided has the most exact estimate on their safety training. For the case study, the following assumptions are to be made:

1. When a worker is on restricted work, they are 50% as productive.
2. These costs are an estimate.

Quiring Case Study

Looking at the past 5 years for Quiring, there are several non-severe injuries on their job sites that resulted in costs to the company. Employee 1, a Quiring laborer, was going about their business on the seventh floor of a hospital in the Central Valley of California. They went to pick up a heavy object and pulled a muscle in their middle to lower back, resulting in 142 days of restricted work or job transfer. Restricted work is defined as when a worker is put on less

strenuous duties and job transfer is when a worker is at the same job but on a different set of duties. It does not necessarily mean lost days of construction but it does have a negative impact on productivity. To some, restricted work is the same as days away from work. A pulled muscle or muscles in someone like a laborer is very unfavorable in that for half a year or more (as the 142 days are working days) employee one was unable to complete his/her tasks to their fullest degree. Some of the consequences of this are another laborer taking over employee one's tasks as well as helping them with other tasks, an indirect cost. Employee 2 received a back injury (the exact nature of the injury is unspecified) resulting in 28 days of restricted work. Employee 3 incurred a lower lumbar sprain from extended stooping, causing a restriction of work for eight work days. Employee 4 obtained a foot contusion from a tool falling on it while working in Quiring's warehouse allowing him restricted work weeks for 12 days.

These are not all of the injuries in the last 5 years, there are more like them but this gives a good snap shot of common injuries that general contractors see for their laborers. Additional costs to consider when an employee is working restricted days: other laborers replacing that worker, general productiveness, lower morale, doctors' visits to get cleared for unrestricted work, physical therapy and more. It would be difficult to quantify the exact amount of dollars lost due to restricted work from injuries like these so it must be estimated.

The focus of this study will be on the indirect cost of injured worker being replaced. Quiring pays \$26 per hour per laborer, which includes wages and overhead. Now, it could be estimated that a laborer on restricted work is 50% as productive as when they are healthy. If Quiring wishes to stay as productive as before the injury occurred, that means they would have to pay another laborer to replace that missing 50%. An extra 50% of that wage and overhead cost is incurred. This means that for every 8-hour workday of restricted work per worker, Quiring incurs an indirect cost of \$104 if the worker is 50% as productive. This is a minimum, as the other direct and indirect costs are not calculated here. This is only for replacing the injured worker with another laborer and there should be other expected costs.

There can be different ways of improving safety while saving money in the long run. There is a limit though, you cannot spend an absurd amount of money on safety and expect it to pay off. You may be the safest company out there but you will be bankrupt quickly. A range of values for increases safety spending could give a conclusive answer to the optimal amount of money for Quiring and other companies like it to invest. Assuming Quiring is not spending enough different scenarios are as follows:

*Scenario 1, 15% increased spending:

Quiring currently has 15 laborers. 15 laborers at an extra \$150 per year is an increase of \$2,250 in safety training per year. If Quiring increases spending on their laborer's safety training by 15%, it would require 22 less restricted working man days or 0.56% of total working man days at 50% productivity per year to become worthwhile. It is important to remember that a restricted working day is costing Quiring \$104 per day at 50% productivity.

*Scenario 2, 25% increased spending:

15 laborers at an extra \$250 per year is an increase of \$3,750 in safety training per year. If Quiring increases spending on their laborer's safety training by 25%, it would require 36 less restricted working man days or 0.92% of total working man days at 50% productivity per year to become worthwhile.

*Scenario 3, 35% increased spending:

15 laborers at an extra \$350 per year is an increase of \$5,250 in safety training per year. If Quiring increases spending on their laborer's safety training by 35%, it would require 51 less restricted working man days or 1.3% of total working man days at 50% productivity per year to become worthwhile.

*Scenario 4, 50% increased spending:

15 laborers at an extra \$500 per year is an increase of \$7,500 in safety training per year. If Quiring increases spending on their laborer's safety training by 50%, it would require 73 less restricted working man days or 1.9% of total working man days at 50% productivity per year to become worthwhile.

*Scenario 5, 100% increased spending:

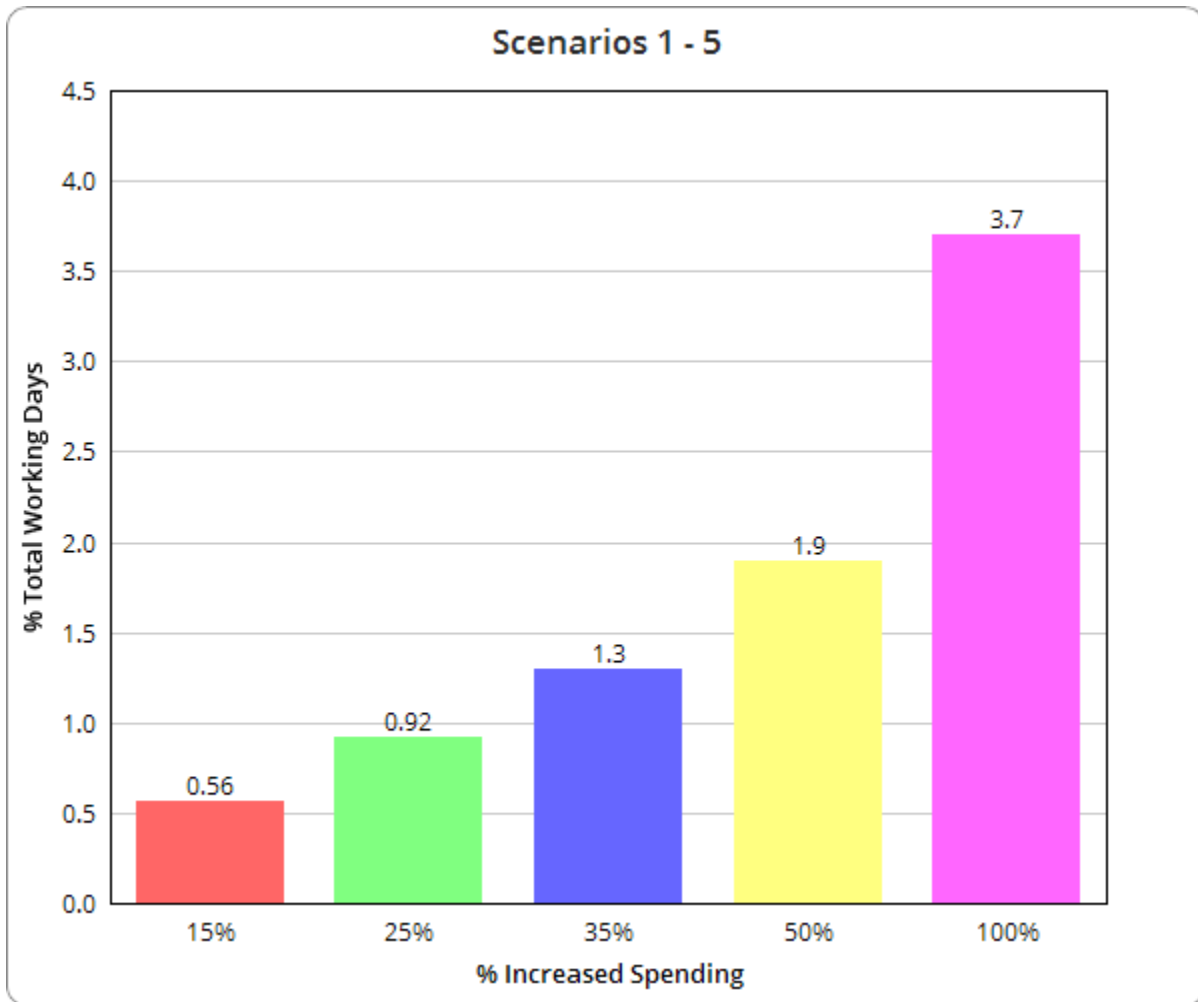
15 laborers at an extra \$1,000 per year is an increase of \$15,000 in safety training per year. If Quiring increases spending on their laborer's safety training by 100%, it would require 144 less restricted working man days or 3.7% of total working man days at 50% productivity per year to become worthwhile.

Logically, for all these examples, there would be savings of \$104 at 50% productivity per day after the required break-even amount is achieved. In addition, to reiterate, this is just for replaced injured workers who are on restricted workdays.

*The work for these calculations is located in the appendix

Results/Discussion:

Graphically, the scenarios described above look like this:



Logically, the more you spend on safety training, the more restricted days are needed to offset that cost. The question is what is realistic? In Quiring's case, how many restricted work days can they reduce with increased safety spending without experiencing diminished returns on that investment? Without testing these numbers with actual companies, the exact result could be anyone's guess.

Realistically, **15% to 25%** increase in labor safety training spending seems the most reasonable. 22 to 36 less restricted days in a year seems like an obtainable goal for a company with 15 laborers. As previously stated, there would be a **return of \$104 per day** for every extra reduction in restricted working days. This is not including the additional costs associated with injuries. On the higher end of the spectrum discussed in scenario 5, a reduction of 144 restricted work days is not unobtainable but it would be difficult to reach year after year.

As an example, it is worth noting that an extra 15% in safety training is not a guarantee employee two (referenced above) would not have hurt their back. There is never a guarantee of safety in construction, but injury rates tend to decline with increased training spending. Companies with effective workplace safety programs have seen improvements in “workplace culture; leading to reductions in injuries, illnesses and fatalities; lowering workers' compensation and other costs; improving morale and communication; enhancing image and reputation”. (OSHA)

Conclusion

In these examples, there may have been a void in the laborer’s training that lead to the injury and there may not have been. It is difficult to tell if the worker is exhibiting integrity when going through training and actively trying to absorb the information. It is equally difficult to tell if spending an extra 15% to 25% will have any effect on Quiring's safety record. They may already be spending the optimal amount of money on training their laborers. While companies like Quiring may spend a great deal of money at the beginning of a workers employment to train them (see Quiring Data under appendix), it may be more important to reinforce that knowledge throughout their career. Taking a small amount of time out of every week to review what job they are performing that day/week and how they can go about it safely could be an option of increased awareness.

Future Research and Closing Comments

Safety is the most important thing on a job site to most contractors and should be treated with seriousness and necessity. Continued research into best practices for safety is a worthwhile undertaking. Future researchers looking to dive deeper into a project similar to this could look at other occupations other than laborers. Perhaps, this study was looking at the situation too narrowly and should have looked at the opposite side of the spectrum: cutting spending. This research could expand to other types of construction companies. The budgets necessary for larger companies would most certainly differ to those of small to mid sized contractors. As a general note, future researchers looking into safety budgets should be wary when contacting companies asking for information as sensitive as safety as it may be harder to extract than one might think. Some of that information might be confidential within the company and will be difficult to extract. It helps to have connections to specific companies that you trust. Hopefully this study has shed light on how safety is more than just part of the budget and it actually can lower costs and possibly receive returns on that investment. Increased safety on job sites can improve relations with subcontractors, owners, and others involved in the construction process.

“All workers have the right to go home safe and sound at the end of the day, whether they've been on the job for one day for 25 years.” (Maddux)

Bibliography

ASSE. "Bosc Article 6." *American Society of Safety Engineers*. ASSE Board of Directors, 8 June 2002. Web. 01 Mar. 2017.

BLS. "EMPLOYER-REPORTED WORKPLACE INJURIES AND ILLNESSES - 2015" 17 Oct. 2016. Web. 14 Mar. 2017.

Camden, Kevin. "Quiring Safety Data." Message to the author. Mar. 2017. E-mail.

Kliewer, Sue. "Quiring Safety Data." Message to the author. Mar. 2017. E-mail.

OSHA. "Injury and Illness Prevention Programs." US Department of Labor. OSHA, Jan. 2012. Web. 13 Mar. 2017.

OSHA. "UNITED STATES DEPARTMENT OF LABOR." *Commonly Used Statistics / Occupational Safety and Health Administration*. 2015. Web. 28 Jan. 2017.

Schneider, Scott P. "The Economics of Health and Safety in Construction." *ELCOSH : The Economics of Health and Safety in Construction*. Laborers' Health and Safety Fund of North America, 2005. Web. 18 Feb. 2017.

Whitlock, David. "Safety Matters." *ForConstructionPros.com*. ForConstructionPros, 16 Aug. 2016. Web. 20 Feb. 2017.

Appendix

Link to OSHA's Plan, Provide, Train program: <https://www.osha.gov/stopfalls/index.html>

Other OSHA data:

In 2015, OSHA reported the "fatal four" of construction deaths are falls, struck by object, electrocutions, or caught-in/between (this category includes workers killed when caught-in or compressed by equipment or objects, and struck, caught, or crushed in collapsing structure, equipment, or material.) Broken down by percentages of total construction deaths, 937, they are 38.8%, 9.6%, 8.6%, 7.2%, respectively. (OSHA)

A 2012 OSHA study looked at the costs of falls from different classifications of construction work and found the following: National Council on Compensation Insurance inc. (NCCI) reports in the 2005-2007 policy years that falls from elevations by roofers cost approximately \$106,000

each and the same fall by Carpenters cost \$97,000 each. All while the same fall cost under \$50,000 each for all other occupational classifications. This could be due to the nature of other occupational classifications (roofers and carpenters generally at a higher elevation during work.

Extra Quiring Data:

Quiring's cost of jobsite employee turnover amounts to about six to nine months of the employee's beginning salary. For project engineers, this number is anywhere from \$30,000 to \$45,000; for a assistant project manager, \$40,000 to \$60,000; for a superintendent, about \$50,000; and for a project manager, \$45,000 to \$67,000. These numbers are a plethora of different costs, not just safety. Sue Kliewer at Quiring stated, "After the first year the cost of training employees drops considerably but since we incorporate our training into other meetings it's really difficult to break it down to a per person cost." So these numbers are rough in nature and are an estimate. It would be extremely tedious to really get down to every dollar spent on any given person in a company. To make matters more complicated, Quiring expressed a caveat that most companies may miss, and that is the employees that provide the training are being taken away from their primary tasks. Quiring estimated this cost of 'lost work' to be about \$7,500 in the first year of the worker's employment. Other costs associated with safety that could be called miscellaneous include things like meetings for PM's/PE's. These meetings could have safety overtones included in the meeting but are not always the focal point and are again difficult to measure on a per person basis and most likely end up classified as general overhead. Lastly, another form of training that Quiring supplies its employees is a training offered by FMI, a consulting firm for construction companies. This happens after two or three years of work and costs about \$8,000 per person. However, it is difficult to determine how much of this estimate is on actual safety training with the exception of laborers.

- Quiring also takes advantage of their workers compensation carrier which does additional safety training at no charge.

Scenario Calculations:

22(less restricted working days) / 52 weeks in a year * 5 working days per week * 15 laborers *
1 year = **0.56% of total working days**

36(less restricted working days) / 52 weeks in a year * 5 working days per week * 15 laborers *
1 year = **0.92% of total working days**

51(less restricted working days) / 52 weeks in a year * 5 working days per week * 15 laborers *
1 year = **1.3% of total working days**

73(less restricted working days) / 52 weeks in a year * 5 working days per week * 15 laborers *
1 year = **1.9% of total working days**

144(less restricted working days) / 52 weeks in a year * 5 working days per week * 15 laborers *
1 year = **3.7% of total working days**