

SAFETY PROFESSIONALS' ROLE IN CONTRACTOR QUALITY PROGRAMS

By Brian Clarke and Kimberly Gamble

The increasing costs of construction defect claims including the cost of rework are driving the industry to improve its quality. This article discusses the overlap and parallels between construction safety and quality control programs, referencing research that connects the relationship between worker injuries and rework.

Rework is often considered an error, a mistake or a cost to be hidden, and therefore may not be properly planned (Photo 1). Experienced construction safety professionals would likely agree that projects with poor housekeeping are often behind schedule and over budget, have higher incident and injury rates, and are plagued by callbacks to perform “warranty work.” More experienced construction safety professionals would also likely note that such projects frequently have building functionality problems, meaning the building does not perform according to the client’s expectations.

Research confirms that a symbiotic relationship exists between poor quality and

safety incidents in construction projects. Wanberg et al. (2013) found a positive linear relationship between the recordable injury rates per 200,000 workers and the number of worker hours related to rework per \$1 million scope of project completed.

Contractor Selection

The construction industry historically has measured contractor safety excellence through the benchmarking of contractors’ experience modification rate (EMR) and OSHA total recordable incident rate (TRIR). Contractor selection processes typically include a prequalification questionnaire. A contractor’s EMR; lost-day case rate; days away, restricted or transferred rate; and TRIR are standard metrics used to evaluate a contractor’s safety outcomes. Measuring excellence through the absence of events and without a severity matrix is a challenge as well as a poor measuring tool to evaluate a successful safety and health program. Today, most trade partners’ safety prequalification processes have advanced to include an evaluation of safety programs, site-specific safety plans, safety orientations, job hazard analysis and weekly safety meetings.

The same challenges exist with the evaluation of contractors’ quality control programs, which commonly measure the lack of rework (or lack of claims). Best-in-class quality control programs structurally mirror safety programs via their processes such as inspections and compliance checklists, policy development, prevention through design and implementation (Rajendran et al., 2012). The goal of both the safety and quality control programs is to prevent losses with the prevention of injuries and the reduction of rework.

The True Cost of Rework

Progressive safety professionals know that incidents and injuries have hidden costs. These costs should be tracked and incorporated into management reporting processes. By providing a fuller picture of incidents, safety professionals and company leaders can make better, more informed decisions about where to focus prevention efforts and spend limited



Photo 1: Rework is often rushed and not properly planned, which can put trade workers at risk. In this photo, mispoured concrete has placed a worker at height and exposed to silica dusts.

resources. Figure 1 (p. 16) depicts a worksheet the authors have used over their careers to identify and track safety incident costs and to educate business owners and leadership on the financial impacts of safety incidents and worker injuries. Both authors, having worked for commercial general contractors, have additionally found this to be a useful tool to engage and educate subcontractors on the full costs of their safety incidents and injuries.

Studies have found that, like safety, rework has direct and indirect costs. The direct costs of rework can range from 0.05% to 20% of a project’s contract value and the indirect costs can be as high as six times the direct costs (Love et al., 2022). If quality events are not measured, the likelihood of repeated errors increases. To advance the awareness of the impact on projects, the same financial tracking methodology of injury and incident costs can be used to report and track rework costs. Figure 2 (p. 17) depicts a worksheet template that can be used to track direct and indirect costs of rework based on the tracking worksheet in Figure 1 (p. 16). (Readers can download these worksheets from <https://bit.ly/4iFe5Pb>).

Communicating Safety & Quality Together

Construction safety has advanced in part due to engaging skilled tradespeople

TAKING ACTION

•**Mirror safety and quality programs.** Structure quality control processes to match safety efforts; leverage inspections, compliance checklists, prevention through design and regular implementation.

•**Track and report rework costs.** Incorporate both direct and indirect costs of rework into management reporting to highlight problem areas and guide improvement strategies.

•**Integrate quality into toolbox talks.** Require weekly trade-level quality discussions, just as with safety meetings, to foster open communication and reduce errors.

•**Adopt a no-blame culture.** Encourage early error reporting without fear of reprisal to promote learning and prevent repeated mistakes.

•**Strengthen contractor selection criteria.** Evaluate both safety and quality performance by reviewing programs, site-specific plans and active prevention measures rather than just loss or claim history.

•**Leverage mentorship for knowledge retention.** Engage experienced workers in crew meetings to train and coach newer team members, helping to mitigate skill gaps and reduce rework.

in safety planning, innovations, inspections, reporting and safety meetings. This has become a standard practice for construction safety implementation with positive measurable results.

Construction projects often find it difficult to obtain reliable and consistent reporting of trade damage, installation errors and other quality mistakes. This may be due to fear of reprisal, financial implications or lack of knowledge. To change this paradigm, the conversation must become standard practice, just as it has with project safety.

On construction sites, a key component of communication, coordination and incident prevention happens through the sharing of information during weekly crew

meetings or toolbox talks. These toolbox talks also serve as micro-trainings and opportunities for team building and story sharing, proactively driving safety culture.

While effective quality control programs structurally mirror effective safety and health programs, an often-missing quality program component is the construction industry's key two-way communication with trade workers during these crew meetings. The authors have not encountered a single contractor's quality control program that included weekly quality control meetings with trade workers. This is like having a great contractor safety program without having weekly crew safety meetings.

Safety & Quality in Construction Contracts

The safety of persons and property is part of the standard American Institute of Architects (AIA) contract. This language requires contractors to take reasonable precautions for safety and to promptly remedy damages and loss. AIA indicates that quality control is "an indispensable aspect of construction contracts" (AIA Contract Documents, 2023).

Training and certification are key components upon which contractors rely to meet contract requirements, including training, certifications and continuous education. Most trade workers' training is done on the job, making the sharing of quality information at the trade worker level critical.

While the authors have seen requests for proposals and specifications from owners requesting contractor quality control programs, they have yet to see specifications or contracts requiring weekly trade quality meetings similar to owners' requirements for weekly trade safety meetings.

Key Recommendations

With their knowledge and education in loss prevention implementation and methodologies, safety professionals can assist their employer in developing the outline of quality control programs in their absence, and work in tandem with quality control leaders to mentor and coach to expectations.

Prequalification processes have become a staple of the contractor selection process. Request for proposals from progressive owners and architects regularly require that a contractor's safety and health programs, including a detailed site-specific safety and health plan, be submitted for evaluation as part of the selection process. Like safety, contractor quality control review and selection should place less emphasis on loss runs and claims defense and more emphasis on how contractors implement quality tradesmanship and prevent rework. Standard safety templates can be edited to assist quality control planning and include key quality checkpoints.

Research into the connection between rework and safety incidents is still developing and there is more to learn about this symbiotic relationship and how to identify and prevent rework. What has been identified to date are some precursors to error for rework and safety (Love et al., 2018). These shared precursors include insufficient communication, poor coordination and knowledge and skills.

FIGURE 1
SAFETY INCIDENT COST TRACKING WORKSHEET

A worksheet to identify and track safety incident costs and educate business owners and leadership on the financial impacts of safety incidents and worker injuries (available at <https://bit.ly/4iFe5Pb>).

Incident / Injury Cost Tracking Worksheet

Contractor: _____ **Date:** _____
Job Site: _____ **Time:** _____
Injured Person: _____ **Injured Supervisor:** _____
Site Super: _____
Type of Incident (Near Hit, First Aid, Recordable, Lost Time): _____
Description of Incident: _____

Supervisor's billing Rate: \$

Supervisor's Time	Hours	Cost
Time at incident event		
Transport and/or time at medical facility with employee(s)		
Related paperwork/reports/incident review		
Repair/re-order of equipment		
Re-schedule of work		
Replacement employee(s), hiring, training		
Other (Describe):		

Injured Employee's billing rate:

Employee(s) Time	Hours	Cost
Time away from productive work (medical appointments, paperwork)		
Additional training		
% Reduction for Light Duty <input type="text"/> Days <input type="text"/>		\$ -

Average billing rate for crew: \$

Crew Time	Hours	Cost
Time around incident event hrs. Employees		\$ -
Investigation time (witness, paperwork): Total hours of all.		
Training about incident hrs. Employees		\$ -

Property/Equipment Damage or Loss

Equipment Repair/Replacement/Rental	Cost
List items: _____	

Others involved in investigation/down time (I.e. project engineer, project super, safety/claims, clerical)

Identify if Direct or Subcontractor staff	Rate	Hours	Cost
List people: _____			

Total Indirect Cost	
Medical Expenses (Deductibles & other \$ NOT paid by insurance)	
Total Direct and Indirect	#VALUE!
Profit Margin on Job	Enter %
Total Extra work required to recover this loss	#VALUE!

The above costs do NOT include office staff (processing reports, filing claims, return to work monitoring)
 The above costs are NOT typically covered by insurance such as medical bills, time loss payments etc.

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FIGURE 2 REWORK COST TRACKING WORKSHEET

A worksheet template to track direct and indirect costs of rework based on the tracking worksheet in Figure 1 (available at <https://bit.ly/4iFe5Pb>).

Rework - Cost Sheet (Condensed)				
Contractor: _____		Incident/Injury Involved? _____		
Job Site: _____		Date: _____		
Scope of Work: _____		Time: _____		
Tradepartner(s): _____		Crew Lead _____		
Reason(s) for rework (Ex: Materials, Workmanship, Specification Incompatibility, Incident, etc.): _____				
Description of Incident: _____				
Total Tear Out & Reinstall Costs				
				Cost
Crew Time (see billing rate below)				\$ -
Tools / Equipment Used				
Consumables Used				
Safety Protocols (i.e. training (silica, respiratory protection)				\$ -
New Installation Material Costs				
Replacement employee(s), hiring, training				
Additional GCs/GRs				
Liquidated Damages				
Secondary Mobilization Fees				
Schedule Delays				
Investigation Time (Determining fix, Cause, Responsible Party)				\$ -
Insurance Claim Management (if applicable)				
Other (Describe): _____				
Other (Describe): _____				
Total Rework Costs				\$ -
Crew(s) involved in rework (i.e. trade workers, project supervisors, safety/claims, clerical)				
	# Employees	Rate	Hours	Cost
Tear out Crew				
Rework Install Crew				\$ -
Hiring/Training Time				\$ -
Safety Training/Protocols Time				\$ -
Supervisor Time (Project Mgr; Engr; Super, etc.)				\$ -
Other Trackable Time				\$ -
Total Billable Time				\$ -
Investigation Team Costs (internal leaders, consultants, materials, etc.)				
	# Employees	Rate	Hours	Cost
Quality Control Manager(s)				\$ -
Non-Hourly Supervisors				\$ -
3rd Party Consultants				
Equipment / Tools Specific to investigation				
Other Costs				
Total Investigation Cost				\$ -
		Total Rework Costs		\$ -
		Other Costs		
		Other Costs		
		Total Cost(s)		\$ -
Profit Margin on Job		Enter %		
Total extra work required to recover this loss		(Total \$/PM %)		#DIV/0!
The above costs do NOT include office staff (processing reports, filing claims, return to work)				
The above costs are NOT typically covered by Insurance				
Rev: 03/2024				

These issues are exacerbated in an environment that lacks psychological safety resulting in the hiding of errors instead of learning from them. Safety professionals understand the importance of information sharing and no-blame culture to safety success. One tool that the authors have successfully used over the years has been the all-hands safety meeting, or toolbox talk, which is often a requirement in contracts. To create an environment of sharing lessons learned and quality expectations, incorporate quality discussions into these meetings. Require contract language in contractors' quality control programs to include weekly, trade-specific, trade-level quality training and communications. Consider the different methods to incorporate quality conversations into the organization. For

example, one of the authors found success with a stand-up verbal huddle with key concepts designed to generate employee engagement written on a whiteboard. These were smaller, crew-specific huddles following all-hands safety meetings. The huddle leaders guided open communications that merged daily tasks, safety and quality.

Conclusion

The construction industry has reduced trade injury rates partly through engaging trade workers during weekly safety meetings to increase communication with trade workers and across multiemployer projects, express safety expectations and increase safety knowledge among teams. The same results can be achieved through engaging trade workers during weekly quality

meetings that share lessons learned, the costs of rework and quality expectations.

The construction industry expects to lose up to 20% of its workforce to retirement by the year 2030. This is an enormous loss of institutional knowledge in an industry already struggling with labor shortages. Research into building trades apprenticeship completion and retention identifies "not being taught my trade" as a key component of the retention issues. Facilitating crew meetings where the experienced, skilled trades personnel coach mentors and train the industry's future skilled tradespeople is key to building it right the first time, safely. **PSJ**

References

- AIA Contract Documents. (2023, Sept. 26). Quality control in construction contracts: Ensuring safety, compliance, and client satisfaction. <https://bit.ly/3FEVzbz>
- Love, P.E.D., Teo, P., Ackermann, F., Smith, J., Alexander, J., Palaneeswaran, E. & Morrison, J. (2018). Reduce rework, improve safety: An empirical inquiry into the precursors to error in construction. *Production Planning and Control*, 29(5), 353-366. <https://doi.org/pcjd>
- Love, P.E.D., Matthews, J., Sing, M.C.P., Porter, S.R. & Fang, W. (2022). State of science: Why does rework occur in construction? What are its consequences? And what can be done to mitigate its occurrence? *Engineering*, 18, 246-258. <https://doi.org/10.1016/j.eng.2022.05.010>
- Rajendran, S., Clarke, B. & Andrews, R. (2012, Nov.). Quality management in construction: An expanding role for the SH&E professionals. *Professional Safety*, 57(11), 37-42.
- Wanberg, J., Harper, C., Hallowell, M. & Rajendran, S. (2013). Relationship between construction safety and quality performance. *Journal of Construction Engineering and Management*, 139(10). <https://doi.org/ggbpzz>

Brian Clarke, CSP, has more than 35 years' experience in the construction safety and risk management field. He has authored various articles as well as chapters in safety and health textbooks. He is past chair of the Central Washington University Industry Advisory Council and past member of the ASSP Board of Directors. Clarke is a professional member of ASSP's Columbia-Willamette Chapter.

Kimberly Gamble, CHST, ASP, has more than 30 years' experience in the construction safety and risk management field. She is active with the biannual safety and health conference jointly held by Oregon OSHA and ASSP's Columbia-Willamette Chapter, as well as the Oregon Laborers apprenticeship and training programs. Gamble is a professional member of ASSP's Columbia-Willamette Chapter.

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