Understanding and Minimizing the Cost of Rework in Construction

Travis Davis, CPCU

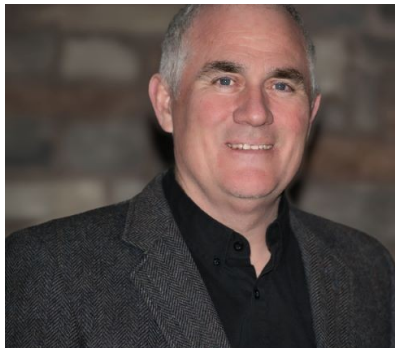
SVP, Broker

Alliant Insurance Services

Silas Nigam

President

S+B James Construction



Brian Clarke, CSP

Managing Partner

Quality Safety Times

Why are we here?

1. We have each heard from Owners, Contractors, and Insurers that Re-Work is a growing problem.

2. We believe this is a problem worthy of an industry-wide response, rather than depending on marketplace incentives.

3. The model exists for correcting this problem.

"Cut first, fix it later." *- Chat GPT on the modern worker*

Audience Poll #1

Who is in the room?

a. Construction company executives / operations
b. Construction company risk managers / legal
c. Insurance underwriters
d. Insurance claims
e. Insurance agents/brokers
f. Project Owners
g. Industry service providers not listed above

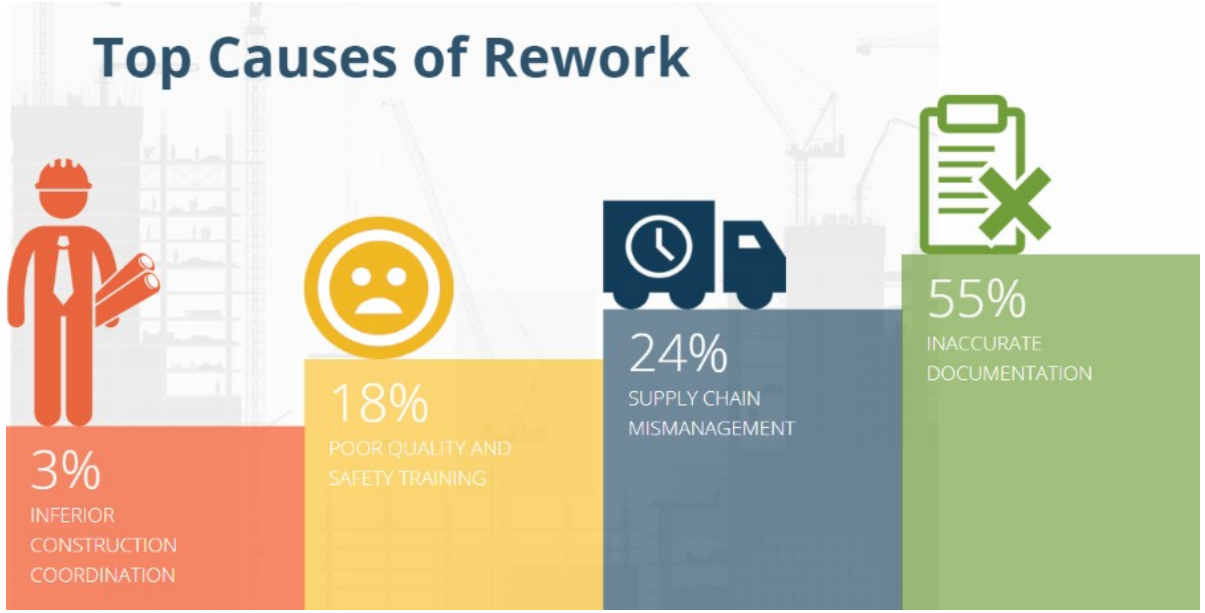
Academic Research

Recent Studies show up to 30% of Construction Costs are directly related to Rework.

* UK Construction Task Force

Rework is estimated to represent between 2% and 20% of total costs, averaging 12%.

* Construction Industry Institute (CII)

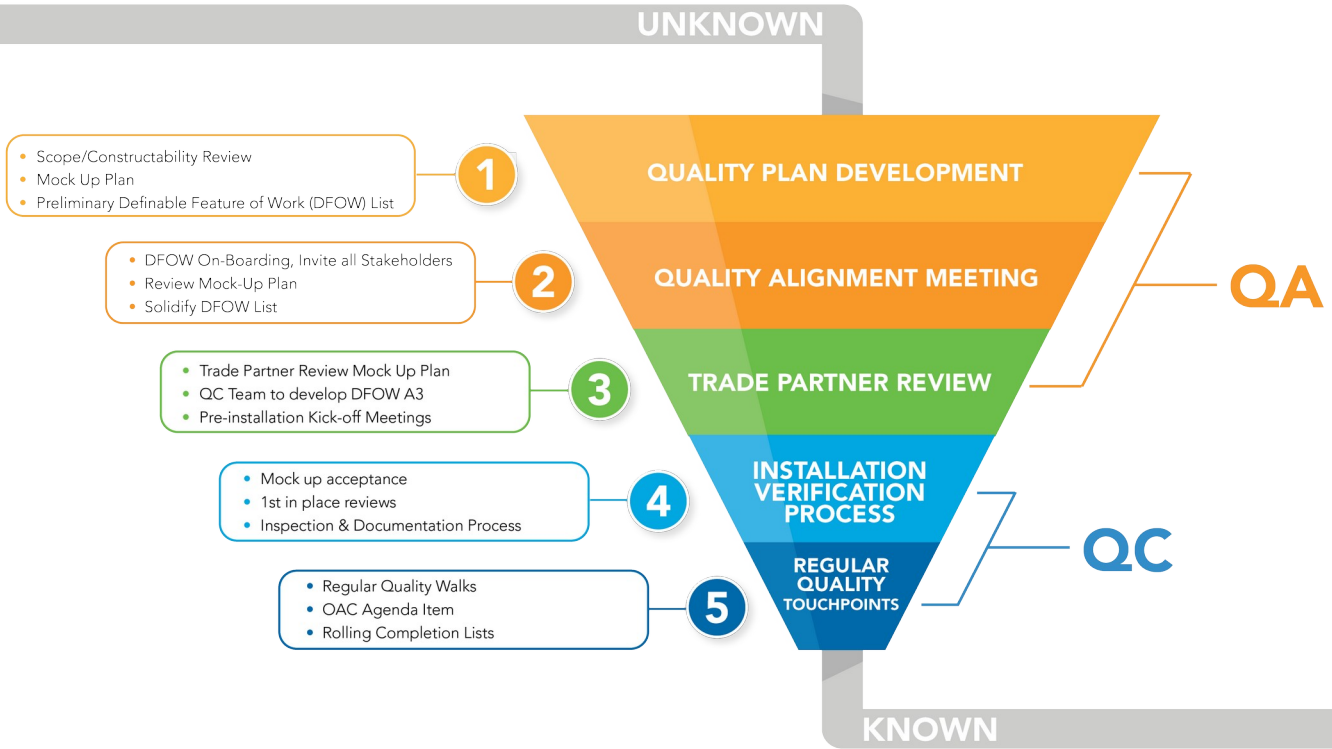


- US Construction Volume is $2 trillion

- Construction Rework is a $200 billion opportunity for our industry

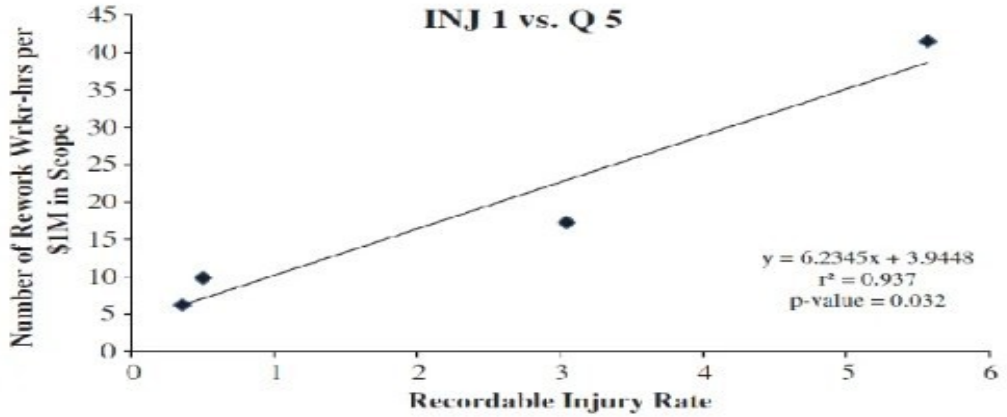
A Contractor's Perspective

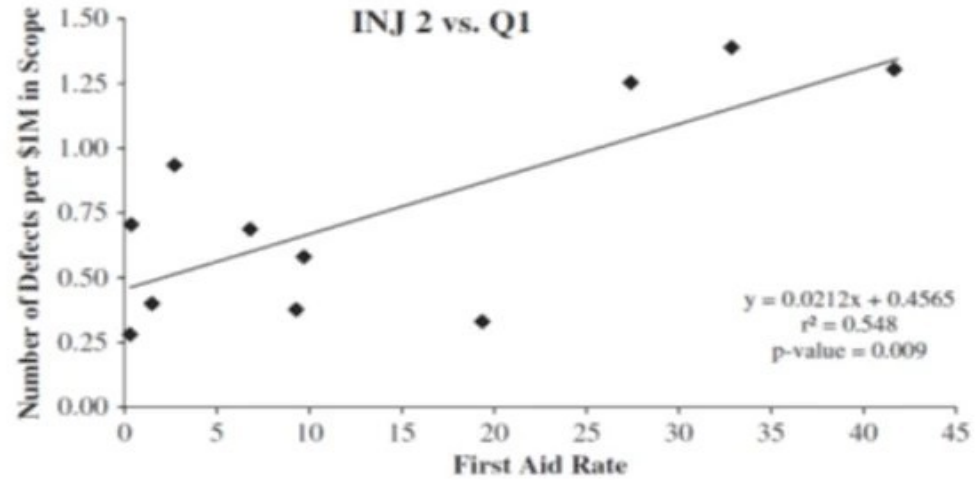
S+B JAMES QUALITY PLANNING PROCESS



S+B James Construction \\ Quality Planning Process

Parallels between Safety and Quality





Program	Quality	Safety
Employee orientation	✓	✓
Employee manual	✓	✓
Checklists	✓	✓
Insurance	✓	✓
Incident rates	✓	✓
Incident reviews	✓	✓
Training – Superintendents	✓	✓
Training – Foremen	✓	✓
Training – Trades/Crafts	×	✓

Evolution of Safety, as a guide for Quality

G.E.W. llc
Incident Indirect Cost Sheet

Contractor
Job Site: _____ **Date:** _____
Injured Employee(s): _____ **Time:** _____
Foreman's Name: _____ **General Foreman:** _____
Type of Incident (Near Hit, First Aid, Recordable, Lost Time): _____
Description of Incident: _____

Supervisor's Billing Rate: $ 0.00

Supervisor's Time	Hours	Cost
Time at incident event	0.00	$ -
Transport and/or time at medical facility with employee(s)	0.00	$ -
Related paperwork/reports/incident review	0.00	$ -
Repair/re-order of equipment	0.00	$ -
Re-schedule of work	0.00	$ -
Replacement employee(s), hiring, training	0.00	$ -
Other (Describe):	0.00	$ -
Subtotal	**0.00**	**$ -**

Injured Employee's Billing Rate: $ 0.00

Employee(s) Time				Hours	Cost
Time away from productive work (medical appointments, paperwork)				0.00	$ -
Additional training				0.00	$ -
% Reduction for Light Duty	0%	Days	0.00	0.00	$ -
			Subtotal	**0.00**	**$ -**

Average Billing Rate for Crew: $ 0.00

Crew Time				Hours	Cost
Time around incident event hrs.	0.00	Employees	0.00	0.00	$ -
Investigation time (witness, paperwork): Total hours of all.					
Training about incident hrs.	0.00	Employees	0.00	0.00	$ -
			Subtotal	**0.00**	**$ -**

Property/Equipment Damage or Loss

Equipment Repair/Replacement/Rental		Cost
List items:		$ -

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

	Rate	Hours	Cost
List person:	0.00	0.00	$ -
	0.00	0.00	$ -
	0.00	0.00	$ -
	0.00	0.00	$ -

Total Indirect Cost	**$ -**

The above costs do NOT include office staff (processing reports, filing claims, return to work moniting
The above costs are NOT typically covered by Insurance

Rev: 08/05

2003 Gary E Bird Horizon Award

Donna Bird

Jack Gibson

How to measure Re-Work

Quality Safety Times

Rework - Cost Sheet (Detailed)

Contractor: _____ Incident/Injury Involved? _____

Job Site: _____ Date: _____

Scope of Work: _____ Time: _____

Tradepartner: _____ Crew Lead _____

Reason(s) for rework (Example: Materials, Workmanship, Specs Non-Compliance, Incident, etc.)

Description of Incident: _____

Direct Costs to Conduct Rework	$	
Tear out / Removal of Finished Work		**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		
LD's		
Secondary Mobilization Fees		
Other (Describe):		
Other (Describe):		

Indirect Costs to Conduct Rework	$	
Tear out / Removal of Finished Work		**Cost**
Lost Crew Time (see billing rate below)		
Schedule Delays		
Investigation Time (Determining fix, Cause, Responsible Party)		
Insurance Claim Management (if applicable)		
Other (Describe):		
Other (Describe):		

Direct Costs to Conduct Rework	$	
Replacement / Repair		**Cost**
Crew Time (see billing rate below)		$ -
Tools / Equipment Used		
Consumables Used		

Quality Safety Times

PROFIT MARGIN CALCULATIONS

	Profit Margin %					
Loss Value	3%	1%	5%	7%	10%	15%
$ 10,000	$ 333,333	$ 1,000,000	$ 200,000	$ 142,857	$ 100,000	$ 66,667
$ 19,150	$ 638,333	$ 1,915,000	$ 383,000	$ 273,571	$ 191,500	$ 127,667
$ 50,000	$ 1,666,667	$ 5,000,000	$ 1,000,000	$ 714,286	$ 500,000	$ 333,333
$ 100,000	$ 3,333,333	$ 10,000,000	$ 2,000,000	$ 1,428,571	$ 1,000,000	$ 666,667
$ 150,000	$ 5,000,000	$ 15,000,000	$ 3,000,000	$ 2,142,857	$ 1,500,000	$ 1,000,000
$ 200,000	$ 6,666,667	$ 20,000,000	$ 4,000,000	$ 2,857,143	$ 2,000,000	$ 1,333,333
$ 300,000	$ 10,000,000	$ 30,000,000	$ 6,000,000	$ 4,285,714	$ 3,000,000	$ 2,000,000
$ 400,000	$ 13,333,333	$ 40,000,000	$ 8,000,000	$ 5,714,286	$ 4,000,000	$ 2,666,667
$ 526,317	$ 17,543,900	$ 52,631,700	$ 10,526,340	$ 7,518,814	$ 5,263,170	$ 3,508,780
$ 750,000	$ 25,000,000	$ 75,000,000	$ 15,000,000	$ 10,714,286	$ 7,500,000	$ 5,000,000

This spreadsheet represents the amount of extra work required to regain a loss based on profit margins
To change calculated loss, change profit margin % in row 9

What gets inspected gets inspected
What gets measured gets ***results***

Loss Analysis – *Water loss during construction*

- Water mitigation and demo $120,000
- Repair/replace drywall, insulation, flooring, cabs, etc. $450,000

Total cost of Re-work due to one loose fitting ***$570,000***

Loss Analysis – *Water loss during construction*

- Water mitigation and demo $120,000
- Repair/replace drywall, insulation, flooring, cabs, etc. $450,000
- Additional project overhead – 8 week delay $80,000

Total cost of Re-work due to one loose fitting ***$650,000***

Loss Analysis – *Water loss during construction*

- Water mitigation and demo $120,000
- Repair/replace drywall, insulation, flooring, cabs, etc. $450,000
- Additional project overhead – 8 week delay $80,000
- Lost productivity – all other trades $300,000

Total cost of Re-work due to one loose fitting ***$950,000***

Loss Analysis – *Water loss during construction*

- Water mitigation and demo $120,000
- Repair/replace drywall, insulation, flooring, cabs, etc. $450,000
- Additional project overhead – 8 week delay $80,000
- Lost productivity – all other trades $300,000
- Lost Business Income – Owner $400,000

_____

Total cost of Re-work due to one loose fitting ***$1,350,000***

Less Insurance Coverage $1,050,000

Total uncovered loss by GC and Subcontractor $300,000

	Profit Margin %					
Loss Value	3%	1%	5%	7%	10%	15%
$ 10,000	$ 333,333	$ 1,000,000	$ 200,000	$ 142,857	$ 100,000	$ 66,667
$ 19,150	$ 638,333	$ 1,915,000	$ 383,000	$ 273,571	$ 191,500	$ 127,667
$ 50,000	$ 1,666,667	$ 5,000,000	$ 1,000,000	$ 714,286	$ 500,000	$ 333,333
$ 100,000	$ 3,333,333	$ 10,000,000	$ 2,000,000	$ 1,428,571	$ 1,000,000	$ 666,667
$ 150,000	$ 5,000,000	$ 15,000,000	$ 3,000,000	$ 2,142,857	$ 1,500,000	$ 1,000,000
$ 200,000	$ 6,666,667	$ 20,000,000	$ 4,000,000	$ 2,857,143	$ 2,000,000	$ 1,333,333
$ 300,000	$ 10,000,000	$ 30,000,000	$ 6,000,000	$ 4,285,714	$ 3,000,000	$ 2,000,000
$ 400,000	$ 13,333,333	$ 40,000,000	$ 8,000,000	$ 5,714,286	$ 4,000,000	$ 2,666,667
$ 526,317	$ 17,543,900	$ 52,631,700	$ 10,526,340	$ 7,518,814	$ 5,263,170	$ 3,508,780
$ 750,000	$ 25,000,000	$ 75,000,000	$ 15,000,000	$ 10,714,286	$ 7,500,000	$ 5,000,000

Loss Analysis – Fireproofing

- Remove and Replace Framing/Drywall $125,000
- Remove FP and apply intumescent paint $30,000

Total cost of Re-work ***$155,000***

Loss Analysis – Fireproofing

- Remove and Replace Framing/Drywall $125,000
- Remove FP and apply intumescent paint $30,000
- Additional Project Overhead – 6 week delay $50,000

Total cost of Re-work ***$205,000***

Loss Analysis – Fireproofing

- Remove and Replace Framing/Drywall $125,000
- Remove FP and apply intumescent paint $30,000
- Additional Project Overhead – 6 week delay $50,000
- Loss Business Income – Owner $705,000

Total cost of Re-work ***$910,000***

	Profit Margin %						
Loss Value	3%	1%	5%	7%	10%	15%
$ 10,000	$ 333,333	$ 1,000,000	$ 200,000	$ 142,857	$ 100,000	$ 66,667
$ 19,150	$ 638,333	$ 1,915,000	$ 383,000	$ 273,571	$ 191,500	$ 127,667
$ 50,000	$ 1,666,667	$ 5,000,000	$ 1,000,000	$ 714,286	$ 500,000	$ 333,333
$ 100,000	$ 3,333,333	$ 10,000,000	$ 2,000,000	$ 1,428,571	$ 1,000,000	$ 666,667
$ 150,000	$ 5,000,000	$ 15,000,000	$ 3,000,000	$ 2,142,857	$ 1,500,000	$ 1,000,000
$ 200,000	$ 6,666,667	$ 20,000,000	$ 4,000,000	$ 2,857,143	$ 2,000,000	$ 1,333,333
$ 300,000	$ 10,000,000	$ 30,000,000	$ 6,000,000	$ 4,285,714	$ 3,000,000	$ 2,000,000
$ 400,000	$ 13,333,333	$ 40,000,000	$ 8,000,000	$ 5,714,286	$ 4,000,000	$ 2,666,667
$ 526,317	$ 17,543,900	$ 52,631,700	$ 10,526,340	$ 7,518,814	$ 5,263,170	$ 3,508,780
$ 750,000	$ 25,000,000	$ 75,000,000	$ 15,000,000	$ 10,714,286	$ 7,500,000	$ 5,000,000

Audience Poll #2

Do you believe the costs of rework have increased in the last 5-10 years?

a. Absolutely
b. Somewhat
c. Not at all

If we could reduce Rework, what do we have to gain?

- Contractors want reduced call-backs and predictable project delivery, leading to higher profits

- Insurance carriers want to reduce claim frequency and severity, leading to higher profits

- Project Owners want to decrease overall project costs both directly and indirectly, leading to higher profits

How do we get there?

- Invest in our People
- Track Re-Work and align goals within the organization
- Budget for craft training (safety and quality)
- Contract verbiage requiring weekly safety **&** quality crew meetings
- Update Pre-task planning forms to include “quality”
- Require “Site specific QC plan” in the RFP
- As part of contractor selection process include QC (every project)
- Refocus (cross-train) Safety staff for Quality

Recap

- The cost of Rework is over $200B annually in the US
- State of the Market is making this problem worse, not better
  - Record construction volume
  - Skilled Labor shortage
- What gets Measured gets Results
- Just like Safety, our industry can rethink our approach to Quality

"It's up to all of us here to Lead the Way"

- *Wendy Cohen*

Questions?