

Quality management: your best defense against construction defect

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Seminar learning objectives

- Background of construction defects (CDs)
- Key loss drivers involved in CDs
- The safety/quality relationship
- Quality management leading indicators
- Lessons learned

Today's outline

- **Section 1 – Introduction to CD exposures**
- Section 2 – Loss drivers
- Section 3 – The safety/quality relationship
- Section 4 – Quality management leading indicators
- Section 5 – Quality management lessons learned

Quality in the construction industry

- Reactive vs. proactive
- Approximately 15% of GCs have written and functional quality management systems
- Roughly 10% of trade contractors have written and functional quality management systems
- Average contractor makes 10% errors according to CII

Industry challenges with CD claims

- We can utilize NCCI or BLS for worker injury statistics
- No industry statistical data source for CD claims
- Statue of repose, statue of limitations and construction contract law
- Full limit loss potential



CD claims statistics

- We estimate there are tens of thousands of CD claims per year
- Every year, we estimate billions of dollars are spent to resolve construction defect claims, rework and warranty claims in North America
- Most construction defect claims can take 18 to 36 months to resolve*
- The majority of defect claims involve allegations of improper and/or deficient design as well as construction*

How construction defects happen

In many cases, a construction defect is a combination of 3 items:

- Faulty materials
- Faulty workmanship
- Faulty design

Evolution of a quality program

- Claims
- Re-active vs. Pro-active
- “We could do better”
- Senior management commitment
- Quality Director position established
- Quality program established



Cultural change required



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The 10 most common construction defects

- Building envelope and structure
 - Door and window, window wall, curtain wall
 - Exterior cladding (stucco, EIFs, brick/stone veneer, siding)
 - Roof
 - Damp proofing and waterproofing
 - Deck and balcony
- Infrastructure
 - Drainage, compaction
 - Structural
 - Electrical and HVAC (condensation)
 - Plumbing
 - Sound, vibration, odor/vapor transmission and code compliance deficiencies (“health & safety issues”, ADA)



Internal water leaks



Source: Photo courtesy of PCL



Exterior water leaks



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The safety/quality comparison

Safety

- Management Commitment
- Safety Director
 - Safety Staff
- Safety Manual
- Pre-Project Planning
- Pre-Task Planning
- Education
 - Orientation
 - Job Specific Training
 - Tool Box talks
- Inspections
- Safety Audit
- Leading/Lagging Indicators

Quality

- Management Commitment
- Quality Director
 - Quality Staff
- Quality Manual
- Expectations Meeting
- Pre-Installation Meetings
- Education
 - Quality Orientation On Site
 - Sequential Mock-Ups
 - Quality Lessons Learned
- Inspections
- Quality Audit
- Leading/Lagging Indicators

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Quality management leading indicators

- Pre-install and first-work-in-place meetings
- 100% material verification
- Zero defect program
- Pre-closure inspection sign-off procedure including digital photographs

Pre-install meetings, 1st work-in-place inspections

- Originated by the US Army Corps of Engineers
- Hold meetings for each CSI division and subdivision
- The pre-install meeting - review the specs, drawings, submittals and manufacturer's installation instructions
- First work-in-place inspections held in the field to verify install
- Follow-up inspections daily



Pre-install meetings, 1st work-in-place inspections



Source: Photo courtesy of PCL

100% material verification

- Compare material delivered to the jobsite with the approved material submittal
- Assign responsibility on the job
- Pass down requirement to trade subcontractors
- Obtain a listing and certification of all materials delivered
- Spot check listing and material certification on a regular basis

Wrong material leaving site



Source: Photo courtesy of PCL

Zero defects program

- Insert zero defect language into all subcontracts
- Start at the beginning of the job
- Conduct a zero punch list kick-off meeting
- Schedule weekly walkthroughs and publish weekly
- Track and correct non-conforming items during the course of the project

Zero defects achieved



Source: Photo courtesy of PCL

Pre-closure inspection sign-off procedure including digital photographs

- Pre-closure inspection
- Hold point in the construction schedule
- Correct identified defects and inspect corrected work
- Conduct a final pre-closure walk-through
- Take and file digital photographs



FIRESTOP
FLOOR 12
UNIT 1

X KITCHEN
W/D CLOSET
BATH A
BATH B

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Aesthetic mock-ups

- Typical mock up we see in the field
- This mock-up is for aesthetics only, it needs to be more functional
- “More than a pretty picture”



Functional mock-ups

- Understand the science of the wall
- Train your staff what to look for
- Develop sequential mock-up installation
- Photograph each step
- Follow-thru in the field



Source: Photo courtesy of PCL

Lab test of wall – Be there



Source: Photo courtesy of PCL

Water testing in the field



Source: Photo courtesy of PCL

Quality management lessons learned

- Standardize/Simplify and train
- Hire consultants if the owner does not
- Implement an effective warranty call-back process
- Have an effective document retrieval system
- Select subcontractors based on past quality performance, not just price
- Provide adequate supervision of subcontractor's installed work

Quality management lessons learned

- CD claims happen to large and small contractors alike
- No project is immune from CD claims
- Contractors that have a written and functional quality management systems should reduce their CD claims and minimize rework
- Pro-active vs. Re-active

Thank you

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