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:

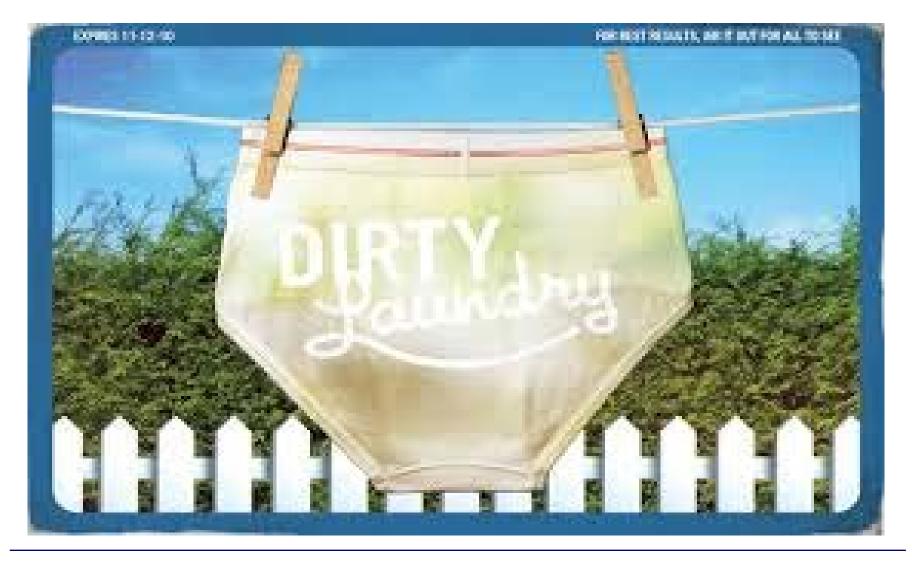
- Faulty materials
- Faulty workmanship
- Faulty design

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

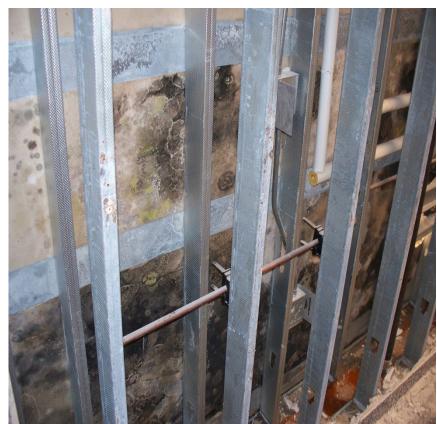
Infrastructure

- Drainage, compaction
- Structural
- Electrical and HVAC (condensation)
- Plumbing
- Sound, vibration, odor/vapor transmission and code compliance deficiencies ("health & safety issues", ADA)



Internal water leaks







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



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



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



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



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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"





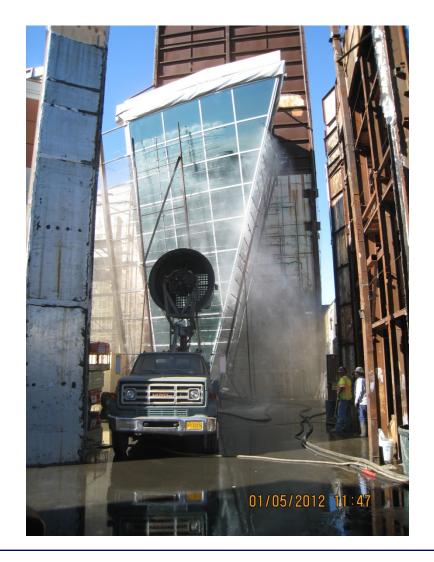
Functional mock-ups

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



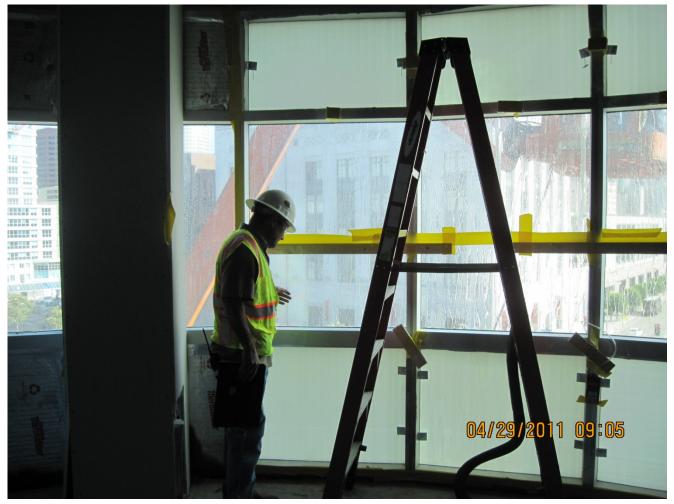


Lab test of wall – Be there





Water testing in the field



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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