Quality Management Presentation
Emerging Issues in Safety, Quality and Claims

Prepared for: AGC of California, Inc.
Date: May 3, 2013

Prepared by: Richard L. Andrews, P.E.
Portfolio Executive
Zurich Services Corporation
Email: richard.andrews@zurichna.com
Telephone: 360.371.8750

Risk Engineering
Presentation outline

- Hand-outs
- Construction industry facts – quality management
- How construction defects happen
- Construction defects – impacts to companies
- 10 most common construction defects
- Construction defect photographs
- The relationship between safety & quality
- Quality & safety excellence go together
- Keys to improving quality
- 10 benefits of a quality management system
- Quality management terminology
- Elements of a quality management plan
- Sample quality management manuals
Presentation outline (continued)

- Other quality management documents
- Quality management implementation
- Quality management metrics
- 5 “quick wins” in quality management
- Quality control program graphic
- Quality management “lessons learned”
- Quality management conclusions
- Questions and answers
Construction industry facts - quality

- ZRE estimates only 10% - 15% of General Contractors (GC) have a formal written quality management program.
- ZRE estimates only 5% - 10% of trade subcontractors have a formal written quality management program.
- Federal government work generally requires that GC’s and all trade subcontractor’s comply with the Project Specific QC requirements and a full-time QC Manager.
- The Construction Industry Institute (CII) has reported that the average contractor makes 10 errors out of a 100 items – the best contractor made 1 error out of 200 and the worst made 19 errors out of 100.
- Customers who implement a robust quality management program can reduce their error rate significantly.

* Source: CII “Making Rework a Reality” - November 2005
How construction defects happen

There are only 3 ways construction defects happen:

- Faulty materials
- Faulty workmanship
- Faulty design

In many cases, the construction defect is a combination of these 3 causes/reasons

The GC and their subcontractors control 2 of the 3 causes/reasons:

- Faulty materials
- Faulty workmanship
Construction defects – some of the possible impacts to companies

- The company’s reputation
- The cost of insurance
- The long tail for claims – the statute of repose – generally 10-years in many states; CA is 10-years.
- The average claim takes 2-1/2 years to resolve and costs $200K
- Time spent handling CD claims is time away from completing projects
The 10 most common CD’s

- Building envelope and structure
  - Door, window and exterior wall deficiencies
  - Roof leaks
  - Damp proofing and waterproofing deficiencies
  - Deck and balcony deficiencies
  - Foundation movement

- Infrastructure
  - Drainage deficiencies
  - Settlement
  - Retaining wall collapse
  - Compaction and structural deficiencies
  - Electrical and HVAC deficiencies - condensation
  - Plumbing and other leaks to internal systems – “wet walls”
  - Sound, vibration, odor, vapor transmission and code compliance deficiencies

- Approximately 75% of CD’s involve water in someway
CD examples

Photo Courtesy of TT Engineers

Photo Courtesy of TT Engineers
Water infiltration at window head - no drip edge at head, no reveal at head, no perimeter sealant (architect specified all of these!)

Photo Courtesy of TT Engineers
Design, specification, manufacturer and contractor installation flaws

Photo Courtesy of TT Engineers
Soil movement or collapse

Photo Courtesy of TT Engineers
Soil movement or collapse

Photo Courtesy of TT Engineers
The relationship between quality and safety

**Question:** What do the following statements about quality have in common?

- Quality is Job 1 – (which company used this in their advertising?)
- Quality is an attitude
- Quality is a journey, not a destination
- Quality is everyone’s job
- Quality is a habit, not an act
- There are no half measures in the pursuit of quality excellence --- you have to do it all
- Quality is a new way of thinking, being and doing
- Quality is so important it pays for itself

**Answer:** see next slide
The relationship between quality and safety

**Answer:** you can interchange the word “quality” with “safety”

- Safety is Job 1
- Safety is an attitude
- Safety is a journey, not a destination
- Safety is everyone’s job
- Safety is a habit, not an act
- There are no half measures in the pursuit of safety excellence --- you have to do it all
- Safety is a new way of thinking, being and doing
- Safety is so important it pays for itself
Quality and safety excellence go together

- Zurich observed that our best contractors with respect to safety performance also had the fewest CD claims.
- Zurich believes that "quality" management systems today are where "safety" management systems were in the 1960’s (pre-OSHA).
Keys to improving quality

- Processes, not people are the problem
- Make every employee responsible for quality - empowerment
- Construction quality can be achieved by implementing a quality management program
- Improve processes that define, produce and support your work product
- Get processes under control by working with employees and managers to identify and eliminate process problems
- Review process performance and make adjustments
10 potential benefits of a quality management system

1. Increases profitability
2. Reduces rework
3. Minimizes punchlists
4. Increases customer satisfaction
5. Reduces the potential for CD claims and warranty call-backs
6. Contributes to a safer construction project
7. Reinforces positive behavior and accomplishment
8. Creates an atmosphere of a high performance team
9. Promotes a culture of continuous improvement
10. Reduces the cost of insurance, ultimately
Quality management terminology

- **Quality Control (QC)** – an aggregate of activities (such as design analysis and inspection for defects), designed to ensure adequate quality, especially in manufactured products. Inspections, testing and documentation are part of QC.

- **Quality Assurance (QA)** – a program for the systematic monitoring and evaluation of the various aspects of a project, service, or facility to ensure that standards of quality are being met. This is the process that validates the QC program is in place and is effective.

- **Quality Management System (QMS)** – the people and processes that are in place to ensure construction meets quality requirements.

- **Quality Management Program (QMP)** – the formal written document that describes the QMS. Sometimes this is called a Quality Management Manual.
Elements of a quality management plan

- Top management commitment
- Mission statement
- Corporate sponsor – Quality Director
- Quality Steering Committee

Written quality management manual (QMM) which includes:

- Responsibility and accountability
- Quality control (QC) processes and procedures
- Quality assurance (QA) processes and procedures
- Training requirements for craft and staff
- 100% material verification procedure
- Zero defect program
- Third party inspections and testing procedure
- Non-conformance procedure and documentation
- Digital photography procedure
- Document retention procedure
- Warranty procedure
Sample quality management manuals

ZRE has published sample quality management manuals:

- QMM – Comprehensive for General Contractors (GC’s)
- QMM – Basic for GC’s
- QMM – Basic and Comprehensive for non-building Contractors
- QMM – Basic and Comprehensive for Contractors - Private sector

Each QMM uses proven procedures, consistent processes, terminology, forms and meeting minute templates

Best practice is to have all subcontractors submit a Site-Specific Quality Control Plan for review and approval by the GC

Our QMM’s provide a sample 2-page Site-Specific Quality Control Plan for subcontractors to complete and submit to the GC

Companies should have a “corporate” QMM and require each project to prepare a Project Specific QMM
Other quality management documents

ZRE has developed other quality-related documents:

- Zurich’s Quality Management Program
- QA/QC Self-Evaluation Survey
- Sample Construction Inspection Checklists
- Trade Specific QMM’s including Checklists
- Quality Management Implementation Plan
- Resources on the Topic of Quality
- Mold Risk Control Procedure
- Project Specific Quality Control Orientation
- Water Intrusion Prevention Procedure
- Quality Control Graphic
- Pre-installation Meeting Agenda’s
- Various training webinars on Quality Management
Quality management implementation

- Develop a Quality Management Implementation Plan or use Zurich’s Executive management commitment and resources
- Appoint a Quality Steering Committee to manage your QMP
- Quality Steering Committee meets monthly to monitor performance
- Appoint a “quality champion” or “quality coach” to direct implementation
- Hiring a full-time Quality Director is best practice but not required to get a quality program started
- Select one or more “pilot projects” to test your Quality Management Manual (QMM)
- Criteria for pilot projects should be one of your common project types with a strong project team and an Owner that is open to new ideas
- Ideally, pilot project team members will become trainers during enterprise-wide implementation
Quality management implementation

- Train the pilot project teams to use and follow your QMM in a ½ day training session headed by your quality champion or coach.
- Monitor compliance and provide additional training/coaching as required.
- Update the QMM based on lessons learned from the pilot projects.
- Don’t under-estimate the importance and time commitment to train employees in quality management processes and procedures.
- In the field, superintendents should take the lead in enforcing your QMM.
- Superintendents need to delegate to other project management team members --- superintendents cannot do it all by themselves.
- Getting subcontractors “buy-in” is critical to success.
- Rank your subs as to which have the least number of non-conformances – track and post them on a weekly basis in the conference room.
- Learn from non-conformances – treat every non-conformance just as a “near miss” safety incident!
- Implement quality toolbox talks to review and train crews in preventing and not repeating non-conformances.
Quality management implementation

- Post your quality mission statement in the conference room in the field office
- Perform constructability reviews for high-risk or one-of-a-kind items
- Treat your “mock-ups” as your friends – the more the merrier!
- Appoint a Site Quality Control Supervisor (SQCS) – this can be an engineer or superintendent, as applicable, depending on project requirements
- Require each subcontractor to appoint a Site Quality Representative (SQR)
- No work can take place without the presence of a SQR from the sub
- Subcontractor’s SQR will usually be their foreman or superintendent
- Any non-conformance or punchlist item that is photographed, needs to have a corresponding photograph of the conforming condition --- no exceptions
- Best practice is to file digital photographs in 2 places – one in a chronological file and the other in a topical file, such as, piping, underground, pre-closure, etc.
Quality management implementation

- Having a dedicated warranty call-back team is best practice
- Responding to warranty call-backs within 24 hours is best practice
- The goal should be to resolve each warranty call-back within 14 days
Quality management metrics

How do you know if your company’s Quality Management Program is working?

- Number of non-conformances will be reduced
- Number of punchlist items will be reduced
- Rework costs will decrease
- Customer service survey scores will increase
- Number and severity of CD claims will be reduced
- Number and severity of warranty call-backs will be reduced
- Profitability will increase
- Cost of your insurance will be reduced
- Construction completion dates will be maintained or improved
5 “quick wins” in quality management

1. 100% material verification
2. Pre-install and first-work-in-place meetings
3. Zero defect program
4. Digital photography procedure
5. Pre-closure inspection sign-off procedure including digital photographs
1st “quick win”–100% material verification

- For any material delivered to the jobsite, one of the contractor’s field staff should physically compare the material to the approved material submittal.

- This ensures that unapproved materials are not used on their jobs.

- This person can be an engineer or superintendent.

- The GC should pass down this requirement to trade subcontractors, by insisting that they give the GC on a daily basis, a listing of all materials delivered to the jobsite with a certification that they meet submittal requirements.

- Spot check with the GC’s QC personnel that indeed the sub’s materials comply with submittal requirements.
2nd “quick win” – pre-install meetings, first work-in-place inspections and follow-on inspections

- A proven technique originated by the US Army Corps of Engineers
- These are part of the Corps “3 Phases of Quality Control”
- These meetings are held for each CSI division and subdivision
- It is basically “Plan the work and then work the plan”
- The Pre-install Meeting reviews the specs, drawings, submittals and manufacturer’s installation instructions and resolves conflicts and errors – participants include the owner, designers, the GC and trade subcontractors for that particular work or assembly. Minutes can be published.
- First Work-in-Place Inspections are held in the field to “fly spec” the first work that takes place. Participants are same as above but includes the manufacturer’s rep. Minutes can be published.
- Follow-on inspections are conducted by the sub and/or the GC’s personnel or third party independent inspectors on a daily basis to ensure that work conforms to the requirements
3rd “quick win” – zero defects program

- To complete the GC’s scope of work with a zero punchlist at the time of substantial completion
- To complete outstanding non-conforming items during the course of the project within 7 calendar days of notification of the existence of the non-conforming work item
- To receive the Owner's recognition of the GC’s zero punchlist accomplishments
3rd “quick win” - achieving zero defects

- Start the program at the beginning of the project
- Select a zero punchlist jobsite champion prior to mobilization to the jobsite
- Insert zero defect language in all subcontracts
- Conduct a zero punchlist kick-off meeting with Owner, Architect/Engineers, the GC (OAC) and subcontractors
- Schedule weekly walk-throughs with the OAC project team and update each team member on the results of the walk-throughs
- Publish punchlists weekly
- Hold punchlists to a handful of items and promptly correct them within 1 week
4th “quick win” - digital photography

- Appoint a quality representative to train and implement this procedure
- Label photographs within 24 hours
- Purchase a camera that allows audio files of what the photo is
- Jpeg images and audio file (wave file) are indexed together – no need to transcribe voice files
- File photo’s in weekly albums plus a copy in a topical album, such as, RFI’s, NCR’s and pre-closure
- If a photo of a NCR or punchlist item is taken, one must “clear” that deficiency with a photo of the corrected condition
- Acquire photo management software to make retrieval easy is best practice
5th “quick win” - pre-closure sign-off procedure

- Appoint a pre-closure supervisor (engineer or supt.) to inspect and enforce correction of deficiencies
- Build a 3-day “hold point” into the construction schedule for these inspections
- Walk the area with the applicable trade subcontractors, electrical, mechanical, etc.
- Trade subcontractors have 1 day to make necessary corrections
- Pre-closure supervisor inspects corrected work
- Pre-closure supervisor makes final walk-through with Owner and Design Professional representatives
- Pre-closure supervisor takes digital photographs of every square foot of wall/ceilings to be covered up
Quality Control Program

Meetings:
- Pre-Install
- First-work-in-place
- Building Envelope
- Manufacturer’s reps
- Close-out

Inspection and Testing Plan:
- Quality Tours - ZDP
- By GC
- By Subcontractors
- By Third Parties
- Mock-ups
- Pre-Cover-Up
- Water/Flood Tests
- Factory/Shop

Material Verification:
- Field verify deliveries conform to the submittals
- Manufacturer Visits
- Proper Storage

Documentation:
- Meeting Minutes
- Warranties
- Record Drawings
- O&M Manuals
- Subcontractor QC Plans
- Non-conformance Log
- Inspection & Test Log
- Inspection Checklists
- Photos/Videos

© Zurich Services Corporation
Quality management “lessons learned”

“Built to Code” = Building to the worst the law will allow
Quality management “lessons learned”

- Using an effective photo documentation process before areas are closed-in or covered-up will assist in litigation – “prove your innocence, not defend your guilt”

- Use of third party inspection firms hired by the GC can/should be used to identify deficient areas of construction

- Hire the best inspector, not just the lowest price inspector

- Flood test a representative sample of windows/door assemblies to determine the quality of installations – 2.5% to 10%

- An effective warranty call-back process in place that quickly addresses post-completion customer service issues can reduce litigation
Quality management “lessons learned”

- Have an effective document retrieval system for the time period of the statute of repose where the work was completed
- Companies need to document corrective actions made either prior to or after construction completion
- Document “as-built” construction conditions – record drawings
- Selection of subcontractors should be based on past quality performance, not just price
- Provide adequate supervision of subcontractor’s installed work
- Hire the following consultants if the Owner does not:
  - Waterproofing/roofing consultant
  - Sound and vibration consultant
  - Code compliance consultant
Quality management conclusions

- CD claims happen to large and small contractors alike
- There is no project type that is immune from CD claims
- The majority of CD claims involve water in some way
- Contractors who only perform inspections required by the Owner or what the building code requires will likely build projects with CD’s
- Insured’s that have a QA/QC program should reduce their CD claims
- Insured’s that have a QA/QC program should minimize rework
- Failure to construct mock-ups or 100% inspection of critical assemblies, may result in CD’s
- Implementation of a water intrusion prevention plan can reduce your exposure to CD claims
This information was compiled from sources believed to be reliable for informational purposes only. All sample policies and procedures herein should serve as a guideline, which you can use to create your own policies and procedures. Any and all information contained herein is not intended to constitute legal advice and accordingly, you should consult with your own attorneys when developing programs and policies. No guarantee is provided about the accuracy of this information or any results and further assume no liability in connection with this publication and sample policies and procedures, including any information, methods or safety suggestions contained herein. Nothing herein should be construed as a solicitation, offer, advice, recommendation or any other service with regard to any type of insurance product underwritten by individual member companies of Zurich in North America, including Zurich American Insurance Company. Your policy is the contract that specifically and fully describes your coverage, terms and conditions. The description of the policy provisions gives a broad overview of coverages and does not revise or amend the policy. Coverages and rates are subject to individual insured meeting our underwriting qualifications and product availability in applicable states. Some coverages may be written on a nonadmitted basis through licensed surplus lines brokers. Risk engineering services in the United States are provided by Zurich Services Corporation. © 2013 Zurich Services Corporation. All rights reserved.