

# State of the Construction Defect Industry: What's the Same & What's New



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Pete Fowler  
**CONSTRUCTION**  
Services, Inc.

## INTRODUCTION

On October 19th, 2017 at 10:00am, Alex Prokop and Pete Fowler will present a FREE webinar called "State of the Construction Defect Industry: What's the Same and What's New."

Pete Fowler Construction Services, Inc. has been talking, presenting and writing about construction defects (CD) and CD litigation for a long time. In 2011, we presented a program called The Construction Defect Lifecycle. Lots has happened since then. So, we're back to present "State of the Construction Defect Industry: What's the Same and What's New."

## PROGRAM OUTLINE

1. Introduction
2. Where Have We Been?
3. What's the Same?
4. What's New?
5. Where Are We Going?
6. How Do We Get There?
7. Conclusion

## LEARNING OBJECTIVES

- Introduction to Construction Defects (CD) and the strange world of CD Litigation.
- Review the history of the CD industry.
- Understand building performance standards, investigation practices, and how they relate to Construction Defects.
- Explore where the industry is headed and how we're going to get there.

## BACK-UP MATERIALS

1. Common Construction Defects
2. Portfolio Management of Construction Claims

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  - E. Learning Objectives
  - F. Program Introduction
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  - B. The Construction Defect Lifecycle
  - C. Aluminum Windows & Other Products
  - D. The Great Recession of 2008
3. What's the Same?
  - A. Plaintiff Attorneys
  - B. Windows
  - C. Defense Attorneys & Litigation
  - D. Construction Defect Model
  - E. Portfolio Management of Construction Claims
4. What's New?
  - A. Drained Walls
  - B. Wrap Insurance Policies
  - C. Building Codes
  - D. CD Litigation
  - E. Better Design & QC
  - F. Economy
  - G. Leaking Buildings
  - H. Class Action Litigation
  - I. Commercial Buildings & Public Work
5. Where Are We Going?
  - A. Better Buildings
  - B. Building Information Modeling (BIM)
  - C. Industry
  - D. Windows
  - E. Defects
  - F. Labor
6. How Do We Get There?
  - A. ABC's of Risk Management
  - B. Continuous Improvement
  - C. Deep Thoughts
  - D. Welcome to the Future
7. Conclusion
  - A. Learning Objectives
  - B. Program Outline
  - C. Back-Up Materials
  - D. Webinar Materials
  - E. CE Certificates
  - F. Feedback/Survey



# We know buildings

- EXPERTISE
- PROJECT MANAGEMENT
- TECHNOLOGY
- STANDARDS
- RESULTS

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Services, Inc.

# State of the Construction Defect Industry: What's the Same & What's New



October 19<sup>th</sup>, 2017

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1. INTRODUCTION

## PFCS: We Know Buildings

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1. INTRODUCTION

## PFCS: Who We Are

### SOLUTIONS

We specialize in creating **REAL PRACTICAL SOLUTIONS** that help our clients spend the right amount, on the right work, at the right time.

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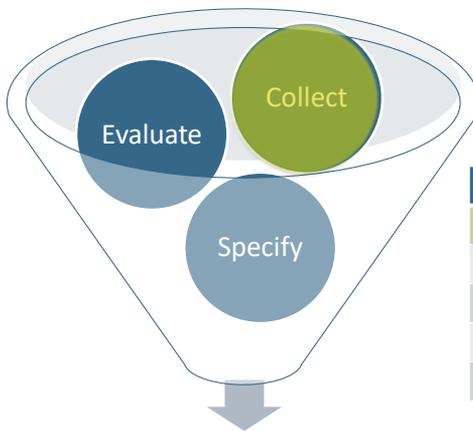
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- Property Owners & Managers
- Builders & Developers
- Contractors
- Product Manufacturers
- Insurers
- Lawyers



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## The PFCS Way



Project Plan	Objective
Level 1	Preliminary Investigation
Level 2	Analysis
Level 3	Reports and Costs
Level 4	Testimony
Level 5	Resolution

Manage / Allocate



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## 1. INTRODUCTION

# The PFCS Way: SOLUTIONS

- **EXPERTISE:** Technical experts who are focused on real practical solutions is surprisingly hard to find. We found them. And we work to keep that focus.
- **PROJECT MANAGEMENT:** To deliver valuable work with measurable return on investment (ROI), we have to manage the Scope, Budget and Schedule of our work.
- **TECHNOLOGY:** We use proprietary technology to create valuable work faster, better and cheaper, to make the information available to all applicable stakeholders, and to create a permanent digital record at no extra cost.
- **STANDARDS:** To help clients manage building lifecycle performance and costs, we compare each project to industry standards and best practices, then apply professional judgment to develop strategies and step-by-step plans for maximizing ROI for maintenance and repair expenditures.



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## 1. INTRODUCTION

## PFCS Services

### CLAIMS & LITIGATION

- Construction Defect Litigation (Also see BLM)
- General (Property) Liability Claims
- Construction Accidents
- Traditional Claims related to contracts, payments, performance, change orders and delays

### BUILDING LIFECYCLE

- Building Inspection, Testing and Property Assessment
- Specifications for Building Maintenance and Repairs
- Construction Budgets and Cost Estimating
- Construction Management
- Quality Assurance Plans and Inspections



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# The PFCS Way

## ON ALL PROJECTS

Building Information Management: We pick up where Zillow and Google leave off. We use technology to collect, organize, structure and store documents and building info forever.

Evaluate Performance: We perform structured building inspection and testing evaluations, exceeding the highest standards.

Specify Solutions: We analyze, report, make recommendations and compose specifications and estimates for construction, maintenance & repairs.

## BLM OR LITIGATION?

Manage Quality: We apply professional construction management discipline to get work done, and create and execute construction quality assurance plans.

Allocate Responsibility: For insurance and legal clients we use our expertise in evaluating, specifying and managing construction to compare what happened in problem projects to what should have. We apply professional judgment to allocate responsibility.



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### 1. INTRODUCTION

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# 1. INTRODUCTION

1. INTRODUCTION

## Introduction

- Presenter Information
- Webinar Materials
- CE Certificates
- Feedback
- Learning Objectives
- Program Introduction



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1. INTRODUCTION

# Webinar Materials



[PROJECTS](#)
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**SEMINARS**

Title	Event date
Slip, Trip, Fall & Personal Injury Claims	12/12/2017
Construction Contracts, Risks & Insurance	11/09/2017
State of the Construction Defect Industry: What's the Same and What's New	10/18/2017
Investigating & Evaluating General Liability Claims from a Building Design, Construction & Maintenance Perspective	09/12/2017
Building Leakage Evaluation & Testing (ASTM E2128) Using the Highest Professional Standards	08/15/2017
Construction Management 101	07/13/2017
Expert Testimony: Preparing in Advance and Analyzing it Afterward	06/15/2017
Construction Document Literacy	05/11/2017
How to Contract for 7-Figure Residential Construction & Remodeling: Applying Professional Contracting Discipline to an Often Messy Business	04/13/2017
Project Planning & Management for Professional Services: Managing Expert Work and Costs	03/15/2017
Contracting 101	02/14/2017
Analyzing & Monetizing Construction Claims: Construction Claim Analysis 101	01/12/2017
Window & Door Installation	12/08/2016
Understanding & Evaluating Construction Estimates	11/10/2016

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1. INTRODUCTION

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## 1. INTRODUCTION

# Your Feedback is Important

## SURVEY SAYS!



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## 1. INTRODUCTION

# Learning Objectives

- Introduction to Construction Defects (CD) and the strange world of CD Litigation.
- Review the history of the CD industry.
- Understand building performance standards, investigation practices, and how they relate to Construction Defects.
- Explore where the industry is headed and how we're going to get there.



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## 1. INTRODUCTION

# Program Introduction

## WHY THIS IS IMPORTANT

- Pete Fowler Construction Services, Inc. has been talking, presenting and writing about construction defects (CD) and CD litigation for a long time.
- In 2011 Pete and Alex presented a program called The Construction Defect Lifecycle. Much has happened since then.
- Pete and Alex are back to present "State of the Construction Defect Industry: What's the Same and What's New



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## 2. WHERE HAVE WE BEEN?

2. WHERE HAVE WE BEEN?

## Where Have We Been?

- Common Construction Defects
- The Construction Defect Lifecycle
- Aluminum Windows & Other Products
- The Great Recession of 2008

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2. WHERE HAVE WE BEEN?

## Common Construction Defects



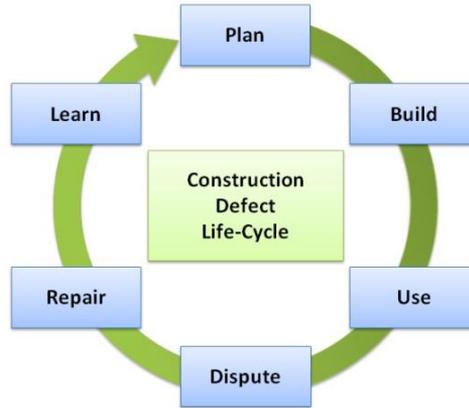
Journal of Light Construction,  
Pub. October 1998

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2. WHERE HAVE WE BEEN?

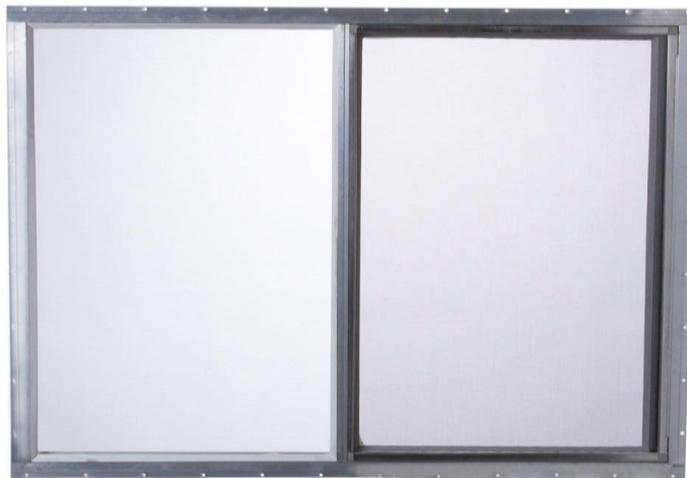
## CD Lifecycle

- Plan
- Build
- Use
- Dispute
- Repair
- Learn

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2. WHERE HAVE WE BEEN?

## Windows

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2. WHERE HAVE WE BEEN?

# The Great Recession



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2. WHERE HAVE WE BEEN?

# CD Lifecycle



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## 3. WHAT'S THE SAME?

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### What's the Same

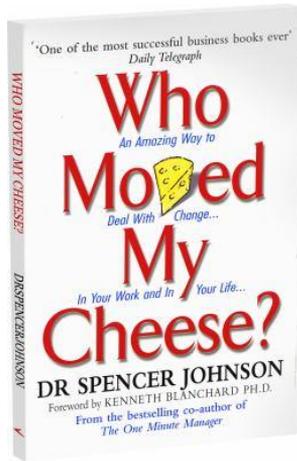
- Plaintiff Attorneys
- Windows
- Defense Attorneys & Litigation
- Construction Defect Model
- Portfolio Management of Construction Claims



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3. WHAT'S THE SAME?

## Plaintiff Attorneys



- ✓ Assertive
- ✓ Entrepreneurial



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3. WHAT'S THE SAME?

## Windows



- Still a major target
- Windows being installed in exposures where they can't handle it
- Lack of focus of protecting windows in harsh climates
- If there's a plain vanilla CD case, windows are the issue, or at least have been investigated.
- “If you build it, they will try to make it leak”



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3. WHAT'S THE SAME?

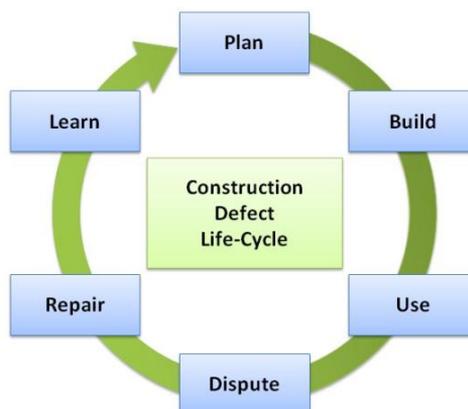
## Defense Attorneys & Litigation

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3. WHAT'S THE SAME?

## Construction Defect Model

Relatively  
Unchanged

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## 3. WHAT'S THE SAME?

# Portfolio Management of Construction Claims

- Claims Management Plan
- Company Level Analysis
- Project Level Analysis
- Vendor Scope-Budget Matrix
- Meeting Minutes



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## 4. WHAT'S NEW?

4. WHAT'S NEW?

## What's New?

- Drained Walls
- Wrap Insurance Policies
- Building Codes
- CD Litigation
- Better Design & QC
- Economy
- Leaking Buildings
- Class Action Litigation
- Commercial Buildings & Public Work



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4. WHAT'S NEW?

## Drained Walls



People are actually paying attention to the details. Including the authors of the code.



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4. WHAT'S NEW?

## Wrap Insurance Policies



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4. WHAT'S NEW?

## Building Codes

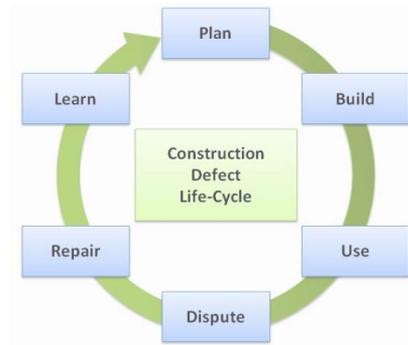


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4. WHAT'S NEW?

## CD Litigation

- Business isn't as big as it was, less litigation in general.
- Different companies have very different strategies for handling litigation - it used to be more transactional.



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4. WHAT'S NEW?

## Design & QC

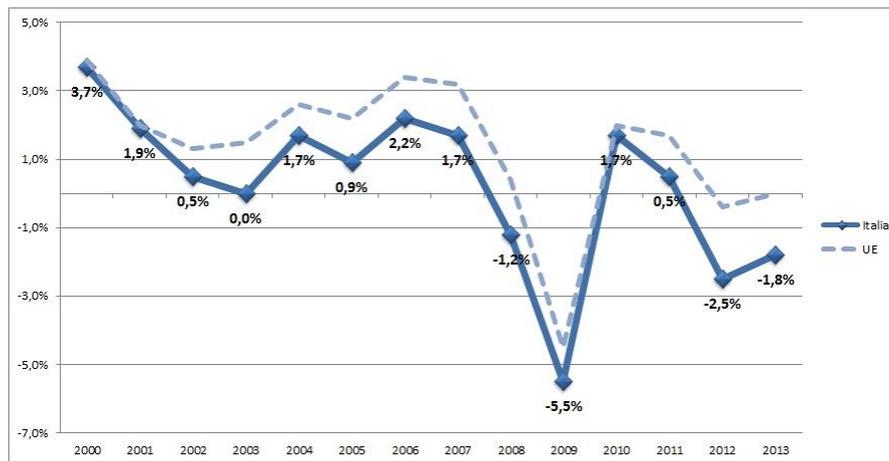
- Builders are smarter
- Independent QC is pervasive
- There are still dumb-a\$\$es



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4. WHAT'S NEW?

## The Economy



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4. WHAT'S NEW?

## Leaking Buildings



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4. WHAT'S NEW?

## Class Action Litigation



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4. WHAT'S NEW?

## Commercial Buildings & Public Work



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# 5. WHERE ARE WE GOING?

5. WHERE ARE WE GOING?

## Where Are We Going?

- Better Buildings
- Building Information Modeling (BIM)
- Industry
- Windows
- Defects
- Labor



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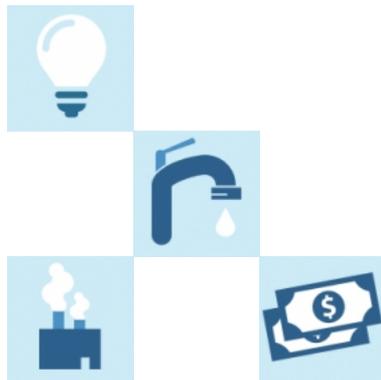
5. WHERE ARE WE GOING?



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5. WHERE ARE WE GOING?

## Better Buildings

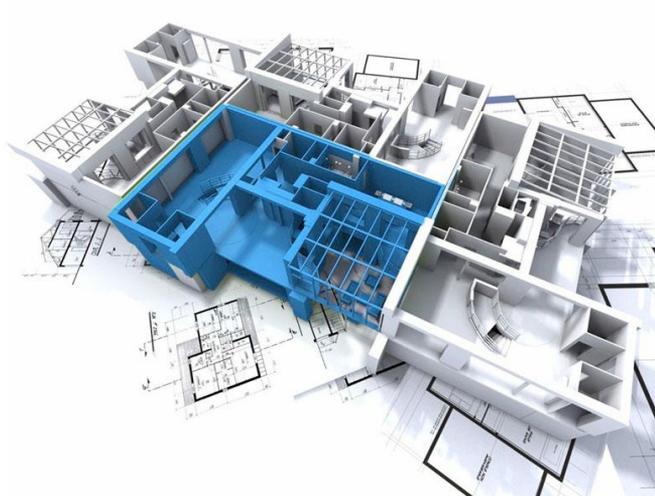


Quality is improving  
in all aspects of the  
modern economy

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5. WHERE ARE WE GOING?

# Building Information Modeling



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5. WHERE ARE WE GOING?

# Windows

As an industry, where are we going?



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5. WHERE ARE WE GOING?

## Defects



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5. WHERE ARE WE GOING?

## Labor



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# 6. HOW DO WE GET THERE?

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## How Do We Get There?

- ABC's of Risk Management
- Continuous Improvement
- Building Industry
- Deep Thoughts
- Welcome to the Future



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6. HOW DO WE GET THERE?

# ABC's of Risk Management



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6. HOW DO WE GET THERE?

# Continuous Improvement



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6. HOW DO WE GET THERE?

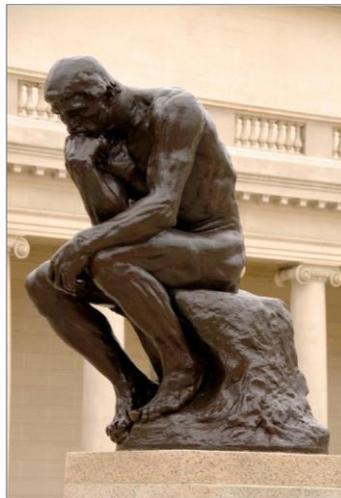
# Building Industry



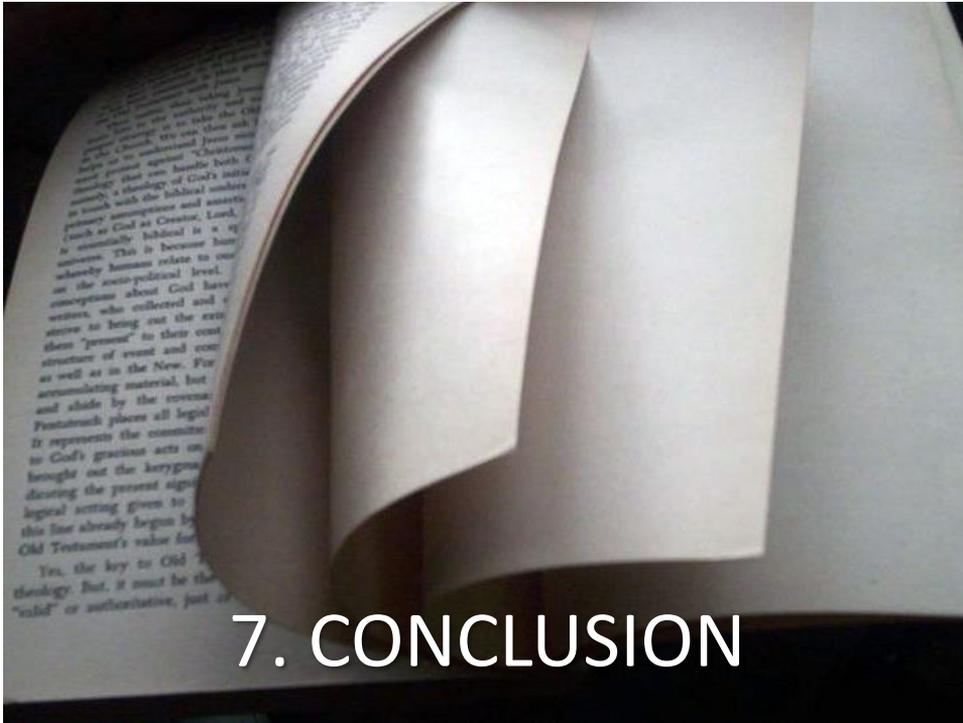
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6. PRESENTING

# Deep Thoughts



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#### 7. CONCLUSION

## Conclusion

- Learning Objectives
- Program Outline
- Back-Up Materials
- Webinar Materials/CE Certificates
- Feedback



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## 7. CONCLUSION

## Learning Objectives

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## 7. CONCLUSION

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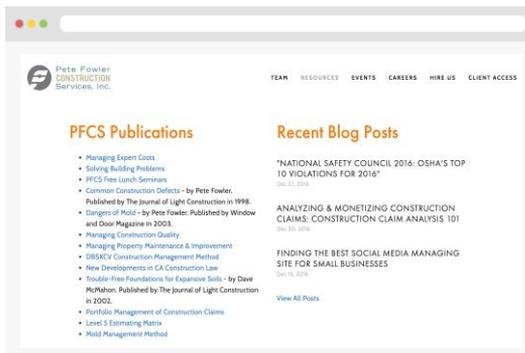


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7. CONCLUSION

# Backup Materials

1. CD Lifecycle 2011
2. Portfolio Management



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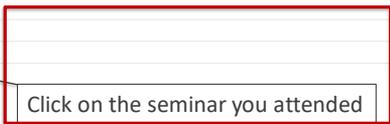
7. CONCLUSION

# Webinar Materials



SEMINARS

Title	Event date
Slip, Trip, Fall & Personal Injury Claims	12/12/2017
Construction Contracts, Risks & Insurance	11/09/2017
State of the Construction Defect Industry: What's the Same and What's New	10/18/2017
Investigating & Evaluating General Liability Claims from a Building Design, Construction & Maintenance Perspective	09/12/2017
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Expert Testimony: Preparing in Advance and Analyzing it Afterward	06/15/2017
Construction Document Literacy	05/11/2017
How to Contract for 7-Figure Residential Construction & Remodeling: Applying Professional Contracting Discipline to an Often Messy Business	04/13/2017
Project Planning & Management for Professional Services: Managing Expert Work and Costs	03/15/2017
Contracting 101	02/14/2017
Analyzing & Monetizing Construction Claims: Construction Claim Analysis 101	01/12/2017
Window & Door Installation	12/08/2016
Understanding & Evaluating Construction Estimates	11/02/2016



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7. CONCLUSION

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7. CONCLUSION

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**Construction Contracts,  
Risks & Insurance**  
Thursday, November 9, 2017  
10:00 am PST



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# Common Construction

# Defects



Since the early 1990s, the Southern California building industry has been engulfed in a bitter fight. Spawned by sub-standard construction during the region's 1980s building boom, construction defect litigation has become a full-

**by Pete Fowler**

fledged "industry," with many architects, engineers, and former building contractors now working full time at construction defect consulting. Attorneys, acting as advocates for homeowners, hire these experts in the effort to prove that shoddy workmanship is causing new homes to rapidly deteriorate. Meanwhile, the home building industry, put on the defensive, is claiming that the real problem is unscrupulous attorneys who are feeding off the media coverage and exploiting the legal system. The reality is probably somewhere in between. Regardless, residential construction in Southern California has never

A guided tour through some of the most common errors and omissions fueling the litigation frenzy in the California building industry

**Figure 1.** Nails that miss the truss — a result of sloppy work with a pneumatic nailer — void the strength of the roof diaphragm.



been so thoroughly scrutinized.

As a licensed GC and construction consultant, I wanted to see for myself the kinds of problems that were being uncovered. After reviewing more than 20 typical repair estimates from past and current construction litigation cases, I compiled a list of the kinds of defects that appeared most often (see “Most Common Defects”). The purpose of this article is not to cover every possible defect, but to illustrate some of the most common ones that I see. In most cases, the cost of doing the job right in the first place is far less than any corrective measure. And if you happen to build in an area where defect litigation is rampant, keep in mind that a seemingly minor surface defect could — given an unhappy client — result in an inspection of your job that turns up all sorts of code violations that had previously gone unnoticed.

### Structural & Framing Defects

Once an inspection gets rolling for some other reason, framing and structural problems are almost always uncovered.

Most of Southern California is located in the most severe seismic zone, meaning most homes are designed by engineers. The builder must strictly follow the engineer’s specifications, otherwise the construction can be considered defective — even if there is no manifest damage.

### Diaphragms and Shear Walls

Failure to follow the nailing requirements for shear walls and diaphragms is a common defect. Many builders temporarily set the plywood in place with a few hand-driven nails, then return later to finish the nailing with a gun. Unfortunately, we sometimes find that the second step in the process has been forgotten and the finish materials are installed over inadequately attached plywood. Another typical mistake is the substitution of box nails or sinkers for the specified common nails, or use of a smaller size nail. Figure 1 shows an example of just plain sloppy nailing.



**Figure 2.** The plywood on this interior shear wall should have been carried all the way to the roof diaphragm.



**Figure 3.** This shear plywood falls short of the shear wall posts on the right and left, and is attached with too few nails.

A more subtle but common problem is failure to carry an interior shear wall all the way to the roof diaphragm (Figure 2). This vertical continuity is necessary for the shear wall to transfer lateral forces from the roof diaphragm down to the foundation.

Sometimes the shear plywood does not extend across the entire width of the shear wall area and thus doesn't reach the post and hold-down that make the system complete (Figure 3). Other times the plywood reaches only the bottom of the two top plates (Figure 4), interrupting vertical continuity at the critical connection between the top of the shear wall and the floor or roof diaphragm above. This can happen when the plywood is installed while walls are framed on the deck and the double top plate is not yet in place. A simple fix is to install a Simpson A35F (flat) or similar metal connector, but the process is made more difficult because finishes must be removed or the work must be performed in a tight attic space.

### Connector Problems

Another common mistake occurs when the hold-downs are attached to the wrong members, creating a shorter shear wall than the plans called for. This is important because the uplift load on the hold-downs increases exponentially as the hold-downs get closer together. When hold-downs are placed too close together, the uplift loads will exceed the hold-down's capacity, creating the potential for catastrophic failure in an earthquake or hurricane (Figure 5).

Improper installation of joist and beam hangers is also quite common (Figure 6). These metal connectors frequently have missing nails and are often found mangled and twisted out of shape, having been cut or bent to fit an application never intended by the manufacturer or structural designer.

As with most structural defects, the repair is simple if the area is accessible. Unfortunately, all too often the repair involves removing expensive finishes to access the framing.



**Figure 4.** This shear plywood should have extended to the top of the double top plate — a mistake that can be remedied with the addition of metal connectors across the two plates.



**Figure 5.** These shear wall hold-downs are too close together, making the shear wall practically useless in resisting overturning forces.



**Figure 6.** An inspection made through a hole cut in the ceiling reveals that the joist hanger at left is bent and missing nails.

**Figure 7.** Instead of folding down over the edge, the felt paper on this rake overhang was cut flush with the top of the sheathing, allowing rain water to wet the surface of the roof deck.



## Roofing

Along with leaky windows, roofing problems are at the root of more construction litigation in Southern California than any other defect. Every roof detail — hips, valleys, ridges, the rake, the eaves, head walls, and so forth — is a potential problem area. Leaks at penetrations are common. Often the roofing felt is not extended over the top of the base flashing in weather-board fashion or is not extended far enough. Sometimes the base flashing is installed with roofing mastic as the primary water-shedding mechanism. The mastic will usually not last for the entire life expectancy of the roof; in fact, it often fails soon after installation.

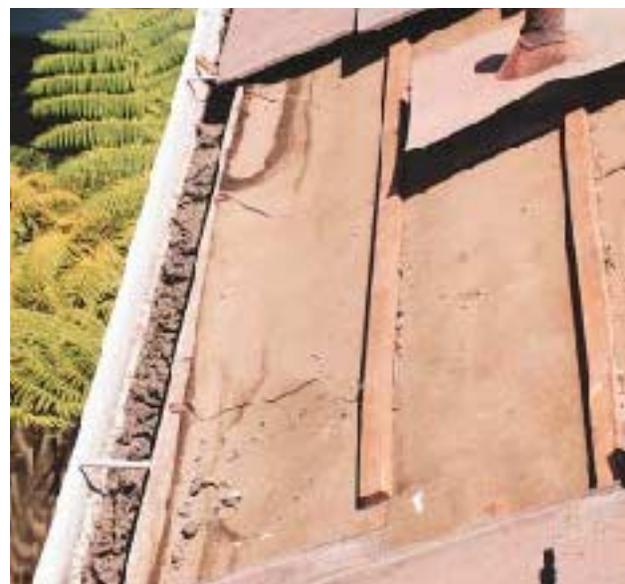
## Rake & Eaves Details

One of the most common mistakes I see is the failure of the roofer to turn down the 30-lb. felt underlayment to cover the edge of the decking at the rake. Instead, the felt is cut flush with the top edge of the roof sheathing or barge rafter. Any water that makes its way past the rake tiles has an easy path onto the wood deck (Figure 7). Unfortunately, like most roofing defects, this cannot be readily inspected on a completed roof because the rake tiles cover the edge of the roof.

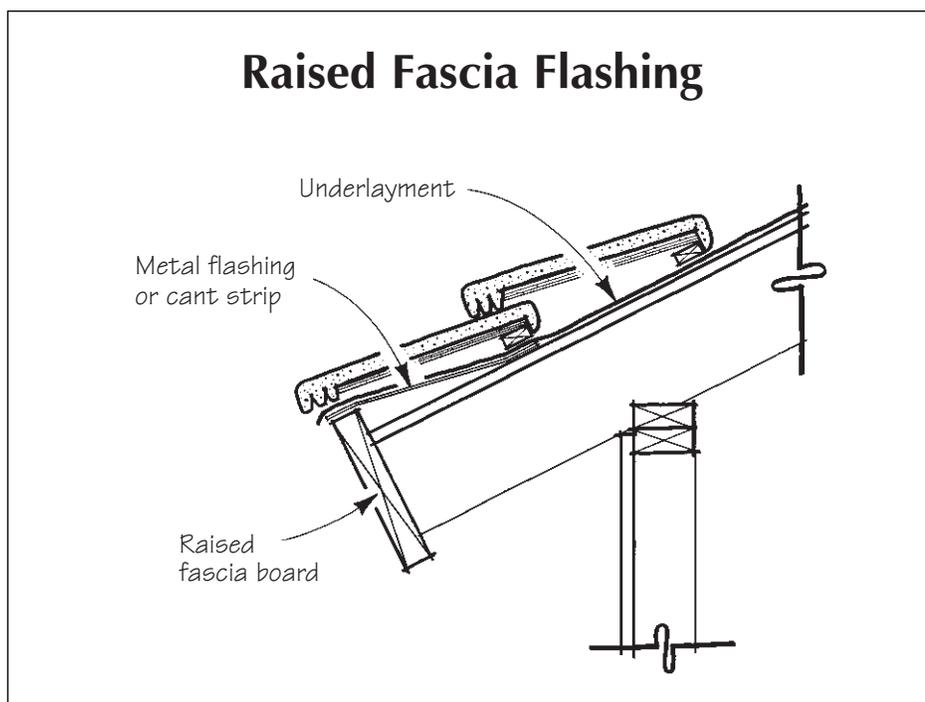
Another common mistake involves a standard tile roof detail: the raised fascia board. The detail is acceptable, but accommodation must be made for the void that is created behind the fascia board by installing a sheet metal flashing or other anti-ponding device. Many roofing contractors omit this flashing, and the underlayment soon begins to sag and pond water, which makes its way behind the fascia and into the eaves (Figure 8).

## Windows

There seems to be a problem in the minds of some window installers and other subs whose work interacts with window flashing: The fundamental concept that water runs down hill has not been firmly established. Keeping this



**Figure 8.** A raised fascia board (illustration) requires a heavy metal flashing or cant strip to ensure that runoff passes over the edge. Otherwise, water will pond, as in the photo, resulting in leaks and rot in the eaves.



theory in mind is the surest resolution to the majority of both window and roofing leaks.

A classic problem is the “reverse lap” at the sill flashing paper, which should lap over the building paper below. The kraft flashing paper is put on first and the building paper is then lapped over (Figure 9). This allows water to easily enter the interior of the building envelope once it passes the exterior finish. Occasionally I’ll see an instance where a worker made an effort to get the building paper under the sill flashing paper but failed to detail the corner junction correctly (Figure 10). These mistakes can be repaired only by removing the exterior finish and reinstalling the building paper to properly integrate with the window flashing paper.

### Painting Wood Windows

Wood windows are the exception in Southern California construction (most are aluminum), which may be the reason they are often not protected adequately from the harmful effects of moisture and temperature extremes. Although most wood windows come with an exterior primer from the factory, all components and all edges should be painted as soon as possible. When wood windows are not properly painted on all surfaces, the unfinished surfaces will take on moisture at a higher rate than the painted areas, creating uneven expansion and contraction and the possibility of rot (Figure 11). A common manifestation of damage is when the windows fail to operate properly, especially after swift changes in the weather.

### Poorly Flashed Penetrations in Stucco

Stucco is the most popular exterior finish in Southern California, and because of this, most water intrusion issues, with the exception of roof leaks, are inevitably associated with stucco in some way. As with window installation, the areas where another trade must interact with the stucco are the source of most of the problems.

## Most Common Defects

Rank by No. of Instances	Defect Description	Avg. % of Total Estimate
1	Structural/Rough Carpentry	14.7%
2	Roofing	8.4%
3	Windows	7.8%
4	Plumbing	5.4%
5	HVAC	2.9%
6	Lath & Plaster (Stucco)	3.5%
7	Fireplaces & Chimneys	0.9%
8	Waterproof Decks	3.4%
9	Fire-Resistive Assemblies	7.5%
10	Civil/Site Drainage/Fine Grading	5.6%

The chart lists the top ten defect items, ranked by the number of instances cited in the repair estimates reviewed by the author. The number in the right-hand column is the average percentage by item of the total estimated cost.



**Figure 9.** The building paper below a window must be tucked below the flashing paper — a detail often botched, as in the top photo. Above is a reverse lap seen from the inside of the wall cavity.

**Figure 10.** Here, the building paper is installed under the flashing paper at the bottom of the window, but not on the side — leaving a vulnerable corner where the flashing paper has been cut.



There is a remarkable shortage of detailed information regarding the flashing and intersection details that cause so many of the problems encountered in construction defect litigation. Most installation specifications and code documents make general statements about the application of plaster or proper cement mixes but do not make detailed recommendations for waterproofing penetrations other than windows, even though they plainly state that “stucco plaster should not be considered waterproof.”

A condition that frequently results in failure is where a deck handrail or cantilevered joist passes through the stucco skin to the framing below (Figure 12). These intersections are difficult to flash and the necessary coordination between the trades is usually lacking. The best idea is to avoid these protrusions altogether. Instead, frame the deck with four posts from the ground and stop the handrail shy of the building.

### Buried Weep Screed

Because a traditional stucco exterior is not “waterproof,” some accommodation must be made to allow moisture to escape. The *Uniform Building Code* mandates the installation of a galvanized steel weep screed at the base of the wall (Figure 13). The screed is nailed to the sill plate, and its upper leg is covered by the building paper. This creates a neat and clean termination for the plaster in addition to allowing the escape of moisture that has found its way behind the stucco.

Unfortunately, all too often the screed is buried behind a patio slab or concrete walk that gets installed after the stucco contractor has left — again, a problem in coordination and planning. When this happens, moisture can't escape, causing the stucco to deteriorate and frequently leading to rot in the sheathing and framing.

### Stucco Cracks

Stucco cracking is one of the most common homeowner complaints (Figure 14). In part, this is a matter of



**Figure 11.** Wood windows should be painted on all raw wood surfaces. Otherwise, they will pick up excessive moisture (as the moisture meter reading in the photo at right shows), causing them to swell or even rot.



**Figure 12.** Framing protrusions, such as handrails (left) and cantilevered joists (right), are difficult to flash properly, inevitably leading to moisture intrusion, cracked stucco, and decay in the structure below.

education: Homeowners should be told to expect minor surface cracks as the stucco shrinks. But it's also a matter of workmanship. Many cracks could be avoided by paying attention to control joints, proper attachment of lath, allowing enough time between coats, and moist curing.

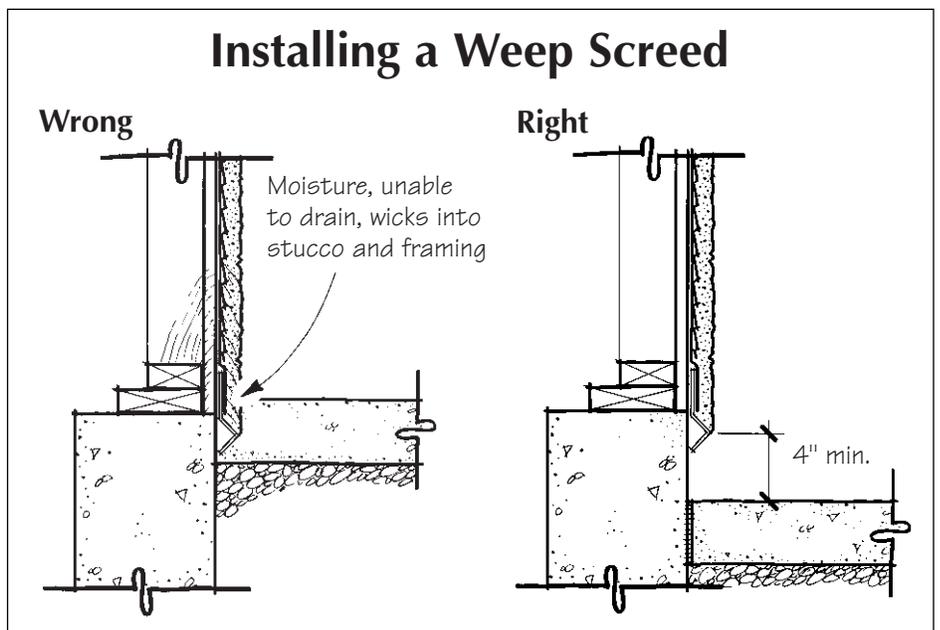
Some industry experts recommend that any cracks  $\frac{1}{32}$  inch or wider should get some type of aesthetic repair, especially in smooth finished stucco. On the other hand, NAHB's manual, *Quality Standards for the Professional Remodeler*, allows a gaping  $\frac{1}{8}$  inch. Whatever your standard, it's best to be up front with the client and establish realistic expectations early in the process.

The repairs for nonstructural stucco cracks might involve applying Thurolastic knife-grade filler and a stucco fog coat over the entire wall plane, using a brush-on elastomeric sealant feathered to match, or dusting in a matching color coat and allowing the moist night air to cure it.

### Waterproof Deck Problems

Waterproof decks are only eighth on the list of defects, probably because they're not found in every residence. But whenever I find them on 1980s mass-produced housing that's involved in litigation (including condos and single-family tracts), these decks seem to always have problems. Many builders have realized the practical difficulty of waterproofing this type of construction, and are now avoiding it altogether. If you continue to build waterproof decks, include as few penetrations as possible and strictly follow the decking manufacturer's installation directions.

The photo on shows a poorly flashed post penetration. The unsealed flashing acted more like a funnel, sending the water right into the framing and keeping it there, where it could do the kind of damage evident in Figure 15. Ponding of water on waterproof decks is another common problem (Figure 16), which can also lead to rot in the structure below.



**Figure 13.** The stucco at the bottom of this wall (photo, top) should have terminated with a weep screed above grade rather than being buried behind an outdoor patio slab.



**Figure 14.** Stucco cracking is one of the most common customer complaints. Tight surface cracks are normal in stucco and can usually be repaired. With quality workmanship, larger cracks can be avoided.



**Figure 15.** Because waterproof decks are difficult to detail properly, rotting substructure is a common defect.

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**Figure 16.** Besides ruining the finish surface, ponding on waterproof decks also leads to deterioration of the framing below.

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**Figure 17.** If hidden by finish surfaces, a leaky toilet connection can go undetected until structural decay sets in.

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## Plumbing Defects

Many of the defects discussed thus far involve exterior water sources. Plumbing defects bring that water source inside the house, with equally serious consequences. Some of the plumbing defects I see are more in the way of nuisance or code violations, like water hammer, excessive water pressure, or loose shower arms. These typically don't involve structural damage from leaks.

A common source for a plumbing leak is a poorly installed toilet (Figure 17). The connection to the closet flange is important because the toilet receives so much use, which includes supporting the entire body weight of the user. If the toilet has not been set level, or if the flange is too high or low in relation to the finish floor, it's only a matter of time before a leak develops. A leaky toilet often goes unnoticed for some time, since the water may leak under the finish flooring directly into the framing.

## Chipped Sinks

This is a manufacturing defect plain and simple — and one that tends to be highly visible and irritating to owners (Figure 18). Although it's not a structural concern, if condo owners or tract house dwellers notice this in one another's homes, it can help start the defect litigation ball rolling. The chipping is normally located at the spot welds in the sinks. The enamel doesn't stick well to the welds and easily chips away, sometimes in a pattern. The solution is not to buy cheap sinks from manufacturers you have not heard of.

## Ponding in Bath Tubs

Ponding in a tub may be a manufacturing problem but more often stems from improper installation (Figure 19). The builder needs to take the time to check the framing, and shim and level the tub as necessary. Otherwise, water will collect and may stain the unit. Again, this is not a life or death issue, but it's one that homeowners will easily see. The cure for this defect, some might argue, is more painful than the disease:

Remove the tub and reinstall it correctly — which usually involves removal and replacement of ceramic tile surrounds.

### Hvac Issues

As with plumbing, many of the hvac defects cited in a typical defect case are nuisance and code issues that are easy to correct, like construction debris in the return air plenum, unsecured units, and no trap vent on the condensate drain. These issues rarely cause serious owner dissatisfaction. Pinched or crushed ducts are another common problem (Figure 20), which can cause uneven heating or cooling and result in owner discomfort. The cause may be sloppy installation or damage by a subsequent trade. The repair is as simple as unpinching the duct or replacing any short sections that have been permanently damaged.

### Flues Too Close to Combustibles

This is a real life safety issue that can cause fires (Figure 21, page 66). It's something the municipal inspector should catch, but it often seems to be missed. Different types of flue vents have different distance requirements from combustibles. Generally, a single-wall vent must maintain 6 to 18 inches or more clearance, while a double-wall (B, BW, or L type) needs anywhere from 1 to 9 inches, depending on the rating of the appliance it is venting. Many vents have clearance guidelines printed directly on the pipe. The stick in the spokes for builders is that many materials we normally think of as not being combustible are considered so by the fire safety section of the code. For example, drywall is considered a combustible material by this code definition.

Sometimes the repair for a problem with distance to combustibles is a simple matter of exchanging a single-wall vent with a double-wall, thus decreasing the required distance. Sometimes it might require reframing the area. The best way to avoid problems such as these is to remember that all flue pipes carrying products of combustion require some separation from com-



**Figure 18.** The chipped enamel in this cheap lavatory sink is the kind of defect that will send condo or tract homeowners ballistic — especially when they see it in every home on the block.

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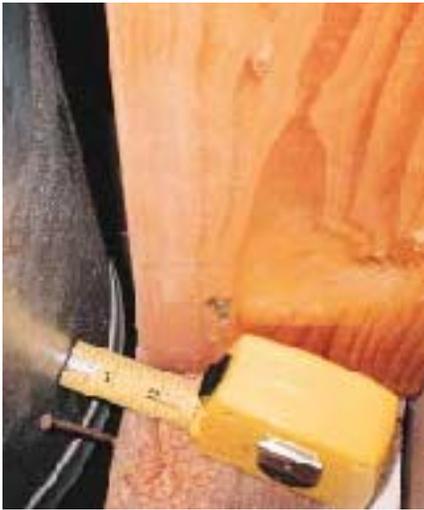
**Figure 19.** Ponding in the bottom of a tub unit — the result of an out-of-level installation — is not structurally serious but is obvious to any homeowner.

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**Figure 20.** A pinched duct can result in uneven temperatures. It's easy to fix if it's accessible, but easier still to avoid.

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**Figure 21.** As a matter of life safety, combustion appliance vent pipes must have proper clearance to combustibles. The guidelines are usually stamped right on the appliance itself.



bustible materials and to follow the manufacturer's installation instructions, which will usually state this requirement very clearly. If you purchase the device and the flue separately, always use the flue recommended by the manufacturer of the appliance.

### Breaches in Firestops

With a mechanical firebox, a firestop must be installed at each ceiling level where the flue passes on its way to the roof. Firestops work the same way fire-blocking does to prevent fire from traveling from floor to floor, as in balloon framing. Specialty subcontractors often install fireboxes and firestops, and sometimes the installation goes into an opening that was not properly framed. Instead of calling for the framer to reframe the opening, which would cost the fireplace installer and the framer time and money, the sub often completes the installation anyway, thinking that unless there is a fire, no one is likely to ever know of the improper installation. Gaps in firestops are a definite code violation and a life safety issue (Figure 22).

### Unsealed Gas Line Penetration in Firebox

Mechanical fireboxes are very common in moderately priced Southern California residential construction. An unsealed gas line penetration at the mechanical firebox is one of the most common construction defects we see (Figure 23). It's a problem because fire that is supposed to be contained within the mechanical firebox could spread to the wood framing behind the box. Lucky for builders, it's also easy to recognize and easy to fix.

There's no removal of expensive finishes needed. The repair is a simple application of fireproof grout to seal around the penetration. 

*Pete Fowler is a general contractor and construction consultant in Southern California. Thanks to Kevin McCoy, C.E., for his assistance with the structural sections of this article.*



**Figure 22.** Firestops are an important safety requirement. Unfortunately, if a gap is missed by the inspector, all too often it will be permanently concealed from view.

**Figure 23.** The pipe penetration into a gas fireplace must be properly sealed with a firestop material — a defect that's easy to spot and easy to fix with fireproof grout.



For building industry players who are engaged in multiple construction claims (builders, general contractors, larger trade contractors, material manufacturers, insurance companies, attorneys) each case can be considered a single battle in a larger war. Deciding how much to spend on each claim – each battle – is hard. How do these expensive decisions get evaluated? Although it should not be guesswork, it often is. PFCS has created a structured process for making these complicated, difficult, strategically important, return-on-investment (ROI) decisions.

PFCS will show you a method for managing your portfolio of construction claims, helping you develop a process for evaluating the costs of various scenarios in construction claim handling. At any point in any case, whether you've spent \$1.00 or \$3 million, you can ask and answer, or at least estimate, these key questions: How much has been spent so far? How much will it cost to get out now? What is a small fight worth? A big fight? What might trial costs look like, and is it worth the risk? As anyone familiar with litigation knows, each of these questions is likely to have best-likely-worst case answers.

The cheapest option is sometimes to get out of the case early, after only the most preliminary analysis. But claims run the gamut, so sometimes a long, expensive fight is the cheapest, best solution, especially if a good outcome will influence other cases.

### *Key System Components*

1. Claims Management Plan: Brief strategy and tactical document including written objective, executive summary, litigation budget, written agreements with attorney and other vendors, a timeline, and a Claims Plan Manager job description.
2. Company Level Analysis: Worksheet that is a master list of all cases with best-likely-worst case scenario figures and a strategy summary for each. This includes a summary of all the individual Project Level Analysis worksheets.
3. Project Level Analysis: Worksheets for each case including best-likely-worst case figures for Attorneys, Experts, Other and Settlement/Judgment costs at various levels of litigation including immediate settlement, a small fight, a big fight and through trial. This includes a summary of the Vendor Scope-Budget Matrix worksheets, plus a settlement hypothesis.
4. Vendor Scope-Budget Matrix: This is an individual budget from each vendor on each project broken down to conform with the Project Level and Company Level Analysis worksheets.
5. Meeting Agenda / Minutes: Structure for preparing for, reviewing and updating the analysis periodically.

# Construction Contractor Company Level Analysis

#	Claim	Demand	Best Case Scenario	Likely Scenario	Worst Case Scenario	Strategy Summary
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# Construction Contractor

## *Project Level Analysis*

Line	Scenario	Level				
		L1: Spent	L2: Now/ASAP	L3: Small Fight	L4: Big Fight	L5: Trial
1	<b>Attorney Fees</b>					
2	Best Case					
3	Likely Case					
4	Worst Case					
5						
6	<b>Expert Fees</b>					
7	Best Case					
8	Likely Case					
9	Worst Case					
10						
11	<b>Other</b>					
12	Best Case					
13	Likely Case					
14	Worst Case					
15						
16	<b>Settlement/Judgment</b>					
17	Best Case					
18	Likely Case					
19	Worst Case					
20						
21	<b>Total</b>					
22	Best Case	\$ -	\$ -	\$ -	\$ -	\$ -
23	Likely Case	\$ -	\$ -	\$ -	\$ -	\$ -
24	Worst Case	\$ -	\$ -	\$ -	\$ -	\$ -

## Construction Contractor

### Scope-Budget Matrix

Line	Scope of Work/Deliverables	Status*	Plan Estimate		Billed to Date	Cost to Complete	
			Hours	Costs			
1	<b>Level 1: Preparatory Work</b>		0	-			
2	A. Images & Information Memo	TBC				-	
3	B. Document Index	TBC				-	
4	C. Issues List	TBC				-	
5	D. Unit Matrix	TBC				-	
6	E. Site Plan/Map	TBC				-	
7	F. Meetings, Teleconferences & Correspondence	TBC				-	
8							
9	<b>Level 2: Preliminary Investigation</b>		0	-			
10	A. Investigation Recommendations	TBC				-	
11	B. Inspection Request with Random Selection	TBC				-	
12	C. Inspection Documentation	TBC				-	
13	D. Players List	TBC				-	
14	E. Scope of Work Matrix	TBC				-	
15	F. Plaintiff Estimate Summary	TBC				-	
16	G. Project Summary Memo	TBC				-	
17	H. Plan Review Memo	TBC				-	
18	I. Cost Estimate - Order of Magnitude	TBC				-	
19	J. Meetings, Teleconferences & Correspondence	TBC				-	
20							
21	<b>Level 3: Analysis</b>		0	-			
22	A. Issues-Discussion Matrix	TBC				-	
23	B. Testing Request with Random Selection	TBC				-	
24	C. Testing Summary	TBC				-	
25	D. Testing Maps	TBC				-	
26	E. Damage Maps	TBC				-	
27	F. Issues-Locations Matrix	TBC				-	
28	G. Scope of Repair	TBC				-	
29	H. Opinion Letter	TBC				-	
30	I. Research Memo	TBC				-	
31	J. Meetings, Teleconferences & Correspondence	TBC				-	
32							
33	<b>Level 4: Detailed Analysis</b>		0	-			
34	A. Request for Proposal	TBC				-	
35	B. Issues-Summary Report	TBC				-	
36	C. Allocations	TBC				-	
37	D. Meetings, Teleconferences & Correspondence	TBC				-	
38							
39	<b>Level 5: Final Analysis</b>		0	-			
40	A. Deposition Questions	TBD				-	
41	B. Deposition Summaries	TBD				-	
42	C. Presentation Outline	TBD				-	
43	D. Presentation (PowerPoint)	TBD				-	
44	E. Exhibit List	TBD				-	
45	F. Expert Designation	TBD				-	
46	G. Meetings, Teleconferences & Correspondence	TBD				-	
47	<b>Totals</b>		0	\$ -	\$ -	\$ -	
48	*D=Done, IP=In Progress, TBC=To Be Completed, TBD=To Be Determined						