

Investigating Water Intrusion Claims



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GENERAL INQUIRY

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Pete Fowler
CONSTRUCTION
Services, Inc.

INTRODUCTION

If you or your client designed, built or manage any part of a building envelope--such as the roof, windows, or stucco—you or they could be at risk for any water damage which might occur.

But how will you know?

Forensic experts from Pete Fowler Construction Services, Inc. will explain the various components of a building envelope that can allow water to intrude into the interior. More importantly, they will explain the methods experts use to isolate the point(s) of entry.

Fully understanding how water can infiltrate and how to prove the source(s) will help you better analyze your client's potential liability or lack thereof.

PROGRAM OUTLINE

1. Introduction
2. Building Basics
3. Inspection
4. Testing
5. Monetizing
6. Presenting
7. Conclusion

LEARNING OBJECTIVES

- Introduction of Building Basics as they relate to leaks
- Explain what a professional inspection includes
- Discuss the merits and standards for building leakage testing
- Explain how leaks in construction defect litigation get monetized
- Discuss common presentation formats and strategies

BACK-UP MATERIALS

1. Case Study: Leaky Condo – Construction Defects from the Plaintiff Perspective
2. Case Study: Builder's "Right to Repair" and Elevator Claims Solved Before Litigation
3. Case Study: Construction Cost Estimate for Water Damage in Condo
4. Case Study: PFCS Saves Contractor \$500,000 in Damage Claims

Originally published: May 7, 2018

Updated: Nov. 8, 2018

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 - B. Presenter Information
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 - E. Program Introduction
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 - D. A Sensible List
 - E. Pete = Crazy Person
 - F. Organizational Schemes
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3. Inspection
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 - B. Property Condition Assessment
 - C. ASTM E2018-08
 - D. Scope, Purpose & Objectives
 - E. ASTM E2018-08 Sections
 - F. Property Condition Assessment Process
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4. Testing
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6. Presenting
 - A. Case Study
 - B. Contracting 101
7. Conclusion
 - A. Learning Objectives
 - B. Program Outline
 - C. Back-Up Materials
 - D. Seminar Materials
 - E. Q&A

We know buildings

EXPERTISE
PROJECT MANAGEMENT
TECHNOLOGY
STANDARDS
RESULTS

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Pete Fowler
CONSTRUCTION
Services, Inc.

November 15, 2018

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1. INTRODUCTION

Program Outline

1. Introduction
2. Building Basics
3. Inspection
4. Testing
5. Monetizing
6. Presenting
7. Conclusion



Read about industry impacts on our blog at www.petefowler.com

1. INTRODUCTION

PFCS: We Know Buildings



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1. INTRODUCTION

PFCS: Who We Are

SOLUTIONS

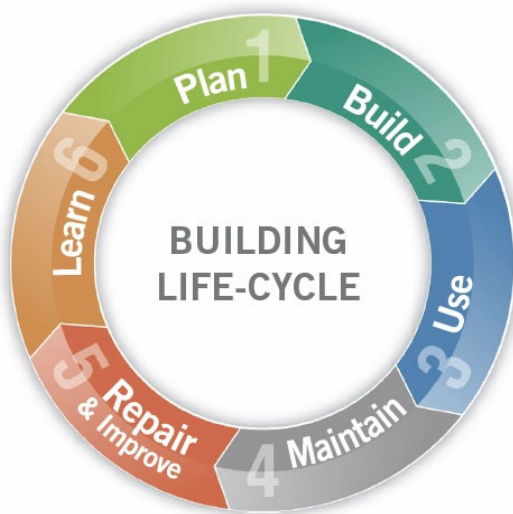
We specialize in creating REAL PRACTICAL SOLUTIONS that help our clients spend the right amount, on the right work, at the right time.



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1. INTRODUCTION

PFCS: We Know Buildings



CLIENTS

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



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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1. INTRODUCTION



1. INTRODUCTION

Introduction

- Presenter Information
- Webinar Materials
- Learning Objectives
- Program Introduction
- Case Study: Leaky Condo



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1. INTRODUCTION

Webinar Materials

[PFCS Client Access](#) [Projects](#) [Publications](#) [Seminars](#) [Users](#)

PFCS Webinar 1/30/2014: Building Life Cycle Management

Seminar Information

Event Date	01/30/2014
Event Time	10:00am
Location	Online via GoToWebinar

Video

There is no video version of this presentation available.

Attachments / Backup Materials

File
 Backup Materials

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1. INTRODUCTION

Learning Objectives

- Introduction of Building Basics as they relate to leaks
- Explain what a professional inspection includes
- Discuss the merits and standards for building leakage testing
- Explain how leaks in construction defect litigation get monetized
- Discuss common presentation formats and strategies



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1. INTRODUCTION

Program Introduction

WHY THIS IS IMPORTANT

If your client designed or built any part of a building envelope (roof, windows, stucco, etc.) they could be at risk for water damage that might occur. But how will they know? Forensic expert consultants from Pete Fowler Construction will explain the components of a building envelope that can allow water intrusion. More importantly, they will explain the methods experts use to isolate the point(s) of entry. Fully understanding how water can infiltrate and how to prove the source(s) will help you better analyze your client's potential liability.



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1. INTRODUCTION

Case Study: Leaky Condo – Big Picture

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Aerial Image



Aerial 01.001



PF 01.006 PF 01-006.jpg

Front elevation. [REDACTED] front elevation shot. Three floors (above grade), flat roof, wood siding and stucco walls. There are four balcony decks on front elevation, each with two scuppers.

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PF 01.133 PF 01-133.jpg Roof. General shot.



PF 01.135 PF 01-135.jpg Roof test A: water is ponding around drain at right elevation near chimney.

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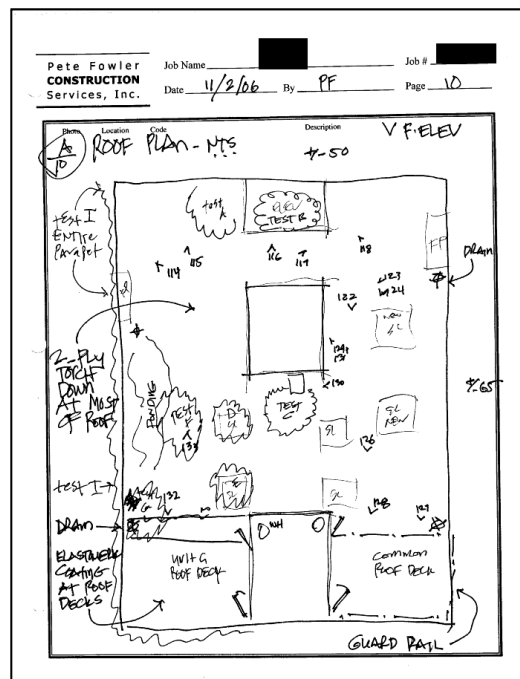
1. INTRODUCTION

Case Study: Leaky Condo - Inspection

Pete Fowler CONSTRUCTION Services, Inc.			Page <u>1</u>
Job Number	[REDACTED]		
Job Name	[REDACTED]		
Date	11 / 2 / 06		
Location	[REDACTED]		
ID / Photo	PF 1-1		
Photo	Location	Code	Description
14.5	INFO		
14.6	F-ELEV		F-ELEV SHOT. 3 FLOORS (NEW GRADE). First floor. WOOD SIDING + STCO WALLS. 4 BALCONY DECKS ON F-ELEV EACH W. 2 SCUPPERS.
15.1	BNH-1		Met ATY [REDACTED] ON-SITE Says UNIT 1 FOT R, 2 Bot L 3 = TOP R, 4 = TOP L.
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1. INTRODUCTION

Case Study: Leaky Condo - Testing



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Job Number	06-295		
Job Name	[REDACTED]		
Date	11 / 2 / 06		
Location	[REDACTED] BLVD		
ID / Photo	PF 1-1		

Photo	Location	Code	Description
1-5	INFO		VENICE, CA
6	F-ELEV		NORTH VENICE F-ELEV SHOT. 3 FLOORS (ABV GRADE). FLAT ROOF. WOOD SIDING + STGO WALLS. 4 BALCONY DECKS ON F-ELEV EACH W. 2 SCUPPERS.
BN 1-1			MET ATTY SCOTT OLKEN ON-SITE SAYS UNIT 1 BOT R, 2 BOT L 3 = TOP R, 4 = TOP L.
1-2			
1-3	SITE		BLOG @ CORNER OF N VENICE + SPEEDWAY.
3-5			N VENICE TOWARD BEACH AND AWAY.
4-7			SPEEDWAY PAST UNIT (NORTH-ISH) AND AWAY (SOUTH-ISH)
8-10	R-ELEV		3 ON SPEEDWAY.
11	F-ELEV		ENTRY TO BLOG AT F/R CORNER RECESSED BLW BLDG CH.
12			CALL BOX @ ENTRY. UNIT A = HEITZ B = EPSTEIN C = LEVI / CLANCY D = ODETT
13-16			SHOTS AT ENTRY.
17	F-ELEV.		ADDRESS VERIFICATION

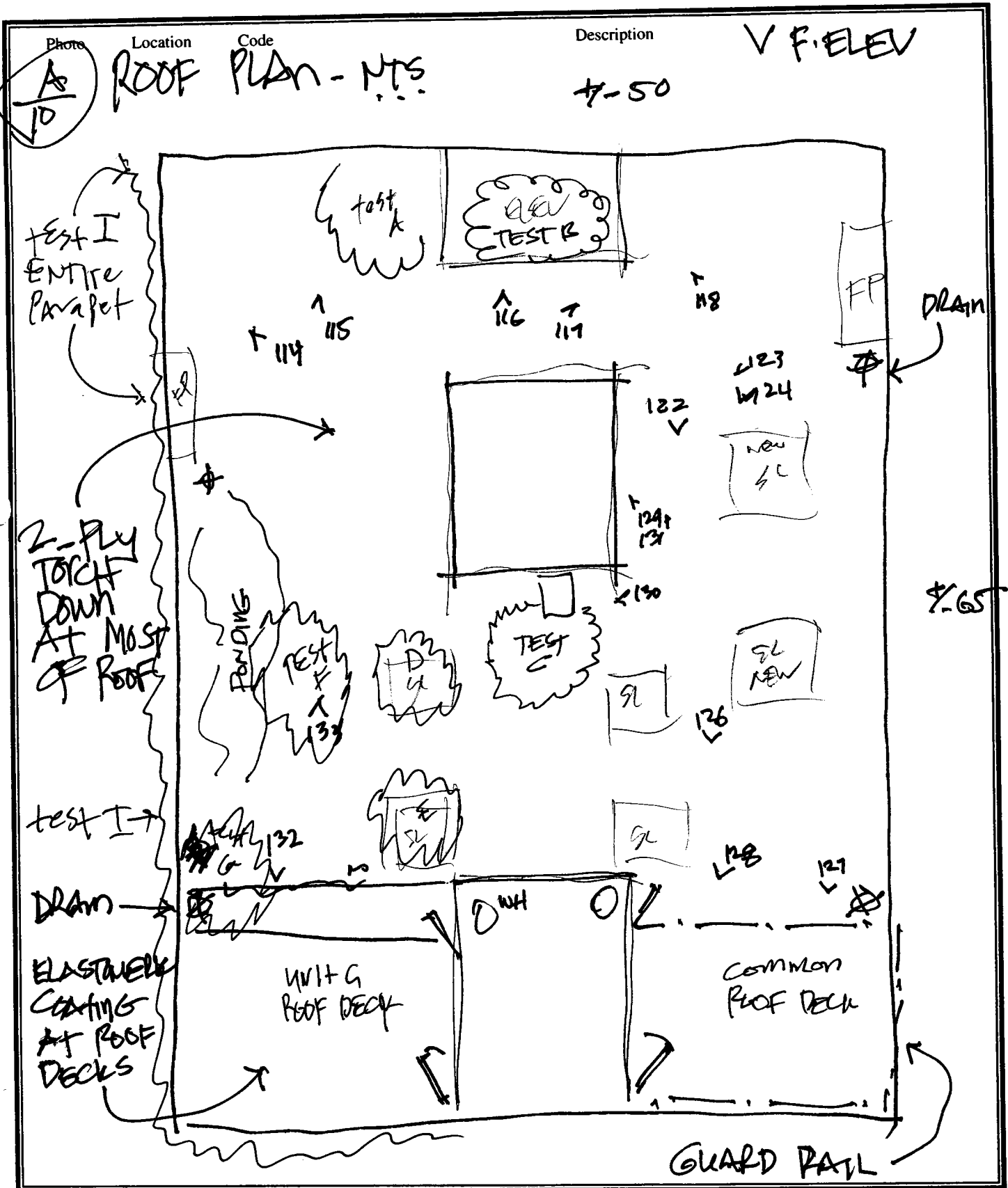


Photo	Location	Code	Description
1.146-8	Roof		UNIT C ROOF DECK IS 21.5' W X 14' DEEP. SEE A/11
(A/11)			
149	"		~~TEST B~~ CONCLUDED @ 10:55
150	"		~~TEST C~~ BEGIN @ 10:55
151	"		ROOF DECK - UNIT C DETAIL. DRAIN SHOTS. SEE A/11.
152			~~TEST C~~ CHANGE POSITION @ 11:00
153-55			ROOF DECK @ C CONT. A/11 PARAPET CAP NEW TOWARD F. OLD TO B. 3-4" OVER LAP. TOP NAILED. SEALANT APPLIED. TYP.
156-7	"		SEALANT OVER BASE PLATE
158-59	"		~~TEST C~~ 11:04 LEAKING AT VENT. LEAKING AT VENT ABV DRYER IN LAUNDRY. EXP JAYS 7 min. INTO TEST

Photo	Location	Code	Description
1.160-3	Landry		LEAKS @ INT FROM TEST C <u>TEST C</u> WATER FROM VENT, WATER ON FLOOR AND DRYER. VENT ABV. NO OBVIOUS LEAKAGE POINT @ T-TOP VENT.
164-7	Roof		
168-170	"		Intrusion could be at corner. RUSTED ELSG BLW SIDING. LOTS OF MASTIC. ADV T-TOP VENT ABV LEAK.
171	"		<u>TEST D</u> PICKED UP @ +/- 11:12 Further BACK FROM LOC C, AROUND SKYLIGHT (ABV BA2)
172-5	"		UNIT C - ROOF DECK A/H transition FROM ROOF TO DECK. ELAST. COATING PAINTED OVER EDGE (+/- 3" CURB).
176-80	"		A/H COATING IS BUBBLING IN ALL AREAS
181-4	"		A/H COATING DETERIORATING + PEELING IN ~~SEV~~ SEVERAL AREAS
NL.12.1			LEELA is owner (SP?)
185-9	"		A/H NEW S.M. AT ROOF EXTENSION OVER DECK @ B.
190-2	"		transitions w- SEALANT W.P. MISAPPLIED ONTO S.M., DOOR THRESHOLD, BOT OF SIDING.
193	"		<u>TEST E</u> 11:25 B SKYLIGHT OVER MRA. HE WAS MOVING BACK + FORTH. ENDED 11:26
194-5			<u>TEST E</u> 11:27 BEGIN

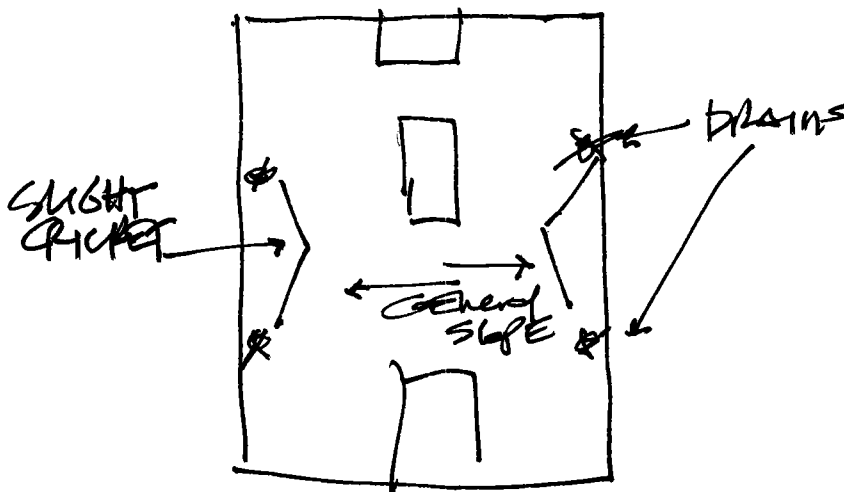
Photo

Location

Code

Description

A
13



1196-7 Roof

198-200 u

201-4 u

205-6 "

207 y

208-11 "

212-17 u

ELIGUATOR RISER/HOOD.
STCO PATCH AT REM'D VENTS.
CORNER W. DETERIORATED S.M.
AND MASTIC.

NEW S.M. AT FRONT OF BLDG.
INTERSECTION W- STCO.

11:38 TEST F CONTINUES.

LOTS OF STANDING WATER.
SPILLAGE AT DECK AREA UNIT C.

ALSO ONE @ COMMON DECK. A/I

CHIMNEY ON R. ELEV NEAR F
IS ABV + ADJ DR IN UNIT C.

NEW METAL ABV. EXTG. BLW.

MASTIC @ VERTICAL TRANSITION.

SIMILAR DETAILING ON B SIDE
OF CHIMNEY. TOP OF ROOFING
MATERIAL (CLAP) SEALED W- MASTIC.
VERTICAL JOINT SEALED W- MASTIC.

218

11:43 TEST F ENDS. NO LEAK.

Pete Fowler
CONSTRUCTION
Services, Inc.

Job Name



Job #

06.295

Date

11/2/06

By

PF

Page

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Photo	Location	Code	Description
1.338-4	L-ELEV		Shot From B. +/- 5' SET BACK w- planter.
342-7	R-ELEV		trim @ Planter on L2 w- Deteriorated trim.
344	F-Yard		Low wall. Hedge.
345-7	"		Shots inside Gate AT R to L
348-9	F-ELEV		trim on L2 Deck on L in Poor Cond.

2. BUILDING BASICS

2. BUILDING BASICS

Case Study: Leaky Condo - Recommendations

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Recommendations

1. Hire a construction manager to coordinate all of the work of the various parties (Owners, Designer(s), Bidders, Contractor(s), Inspection, Manufacturer's Warrantee, Third Party Inspection, etc.)
2. Compose initial budgets and coordinate financing.
3. Hire an architect, roof consultant or building consultant to design the repairs.
4. Design and specify repairs. Compose a complete set of project drawings and documents.
5. Update Budget and initial (conceptual) schedule.
6. Pre-Qualify contractors for availability, interest, qualifications, references, etc.
7. Compose RFP documents and put the project out to bid
8. Contract with a single general contractor or multiple prime contractors including scope, costs, schedule, and terms. Coordinate this work with HOA's legal counsel.
9. Procure permits with the local municipality
10. Coordinate work
11. Coordinate third party inspection service or designer to verify the work is being installed in conformance with the design.
12. Coordinate final inspection.
13. Collect all project documentation and package for reference.
14. Compose maintenance program and coordinate.

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2. BUILDING BASICS

Case Study: Leaky Condo - Estimates

Pete Fowler
CONSTRUCTION
Services, Inc.

Opinion Letter

Date:	April 3, 2007
To:	Eng. Eng.
From:	Pete Fowler Construction Services, Inc.
Project:	
Regarding:	Opinion Letter
Note:	Confidential Attorney-Client and Attorney Work Product. Protected under all applicable evidence codes.

Dear Mr. [REDACTED] and Mr. [REDACTED]:

Pete Fowler Construction Services, Inc. (PFCS) has analyzed documents and information related to roofing, waterproofing and water damage at [REDACTED]. Our findings are summarized in this preliminary report.

I. Project Summary

The project is a 3-level, 4-unit condominium building near the beach in [REDACTED] constructed around 1988-89. The building occupies the entire lot except for minimum set-backs (5 to 10-feet) at all four elevations. Level 1 consists of individual parking garages accessed at the back elevation, storage rooms, a studio and an entry foyer to access the elevator to the second floor (Units A and B or 1 and 2) and the third floor (Units C and D or 3 and 4). The building has a low slope roof, roof-top deck areas, wood siding and stucco exterior building walls, and a slab-on-grade foundation. There are four balcony decks on front and four on the back elevations.

Ms. [REDACTED] is the owner of the top right unit (Unit [REDACTED]). She purchased the building before completion and sold three of the units as condominiums. Low-slope roof replacement work and replacement of the roof-top deck areas was performed by an unlicensed roofer hired by the HOA during the winter of 2004-05. Ms. [REDACTED] reported dramatic leakage into her unit. There was additional leakage into the neighboring unit and the garage during the winter of 2005. This was due in part to the removal of the old roof and lack of protection during the rains. Although some repairs have been made the roof continues to leak into Unit [REDACTED]. The owner is suing the HOA due to the leaks. There is interior damage and Ms. [REDACTED] has received estimates in the range of approximately \$100,000 for the interior repairs.

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10505 S.W. Barber Blvd., Suite 301, Portland, OR 97219 T: 503.246.3744 F: 949.240.9972

Page 2 of 7

SC Opinion Letter 07-04-03 D.doc

Summarized Timeline

04/07/89 [REDACTED] receives title to all units.
03/12/04 [REDACTED] has air conditioning installed on roof (over [REDACTED] protest) by [REDACTED]
11/21/04 Roof tear-off begins (per [REDACTED]). Rain falls. [REDACTED] video shows torrent of water infiltration.
11/23/04 [REDACTED] has un-permitted skylights installed in roof by [REDACTED] as unlicensed contractor, despite violation of roof deck right warnings by [REDACTED]
9/12/06 [REDACTED] files First Amended Complaint against [REDACTED], et al.

Observations

PFCS attended a visual inspection of building on November 2, 2006. At that time PFCS observed opposing party's expert [REDACTED] water testing on the roof. Our on-site investigation included visual inspection of the building exteriors and the interiors of the two top floor units.

ROOF AND ROOF TOP DECK AREAS: The contractor who performed the work appears to have made no attempt to conform to industry or manufacturer's installation standards (see PFCS Issues List for details). The roof leaked dramatically during the rainy season of 2004 during the roofing work, and continues to leak to this day, as evidenced by the defense expert's testing in November 2006. In addition, the building is not being maintained in a way that will lead to acceptable performance going into the future.

INTERIORS: We observed damage from leakage at both interior units we visited. The [REDACTED] unit has not been repaired since the rains of 2004 and shows signs of significant water intrusion. The neighboring unit has been repaired but shows signs of continued leakage.

II. Analysis

Documents Reviewed

1. First Amended Complaint
2. Answer to First Amended Complaint (HOA [REDACTED])
3. Repair estimates obtained by Plaintiff
4. First Amendment to the Condominium Plan
5. CD-Rom of roof, water leakage, skylights and air conditions photographs

Issues Summary - See Issues List for more details

1. Maintenance
2. Waterproofing - Decks (Roof-Top Decks)
3. Roofing
4. Skylights
5. Interior Finishes
6. Estimating/Budgeting
7. Other

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2. BUILDING BASICS

Case Study: Leaky Condo – Conclusions

Page 3 of 7

SC Opinion Letter 07-04-03 D.doc

Conclusions

The owner received proposals from several contractors for the interior repairs which are all approximately \$100,000. In addition, we estimate the cost to replace the roofing and roof top decks to be approximately \$133,000, including the design and coordination of this complicated work.

Recommendations

Conclusions

The owner received proposals from several contractors for the interior repairs which are all approximately \$100,000. In addition, we estimate the cost to replace the roofing and roof top decks to be approximately \$133,000, including the design and coordination of this complicated work.

2. SA Inspection Documentation
3. SC Issues List
4. SD PFCS Repair Estimate
5. SE Estimate Summary

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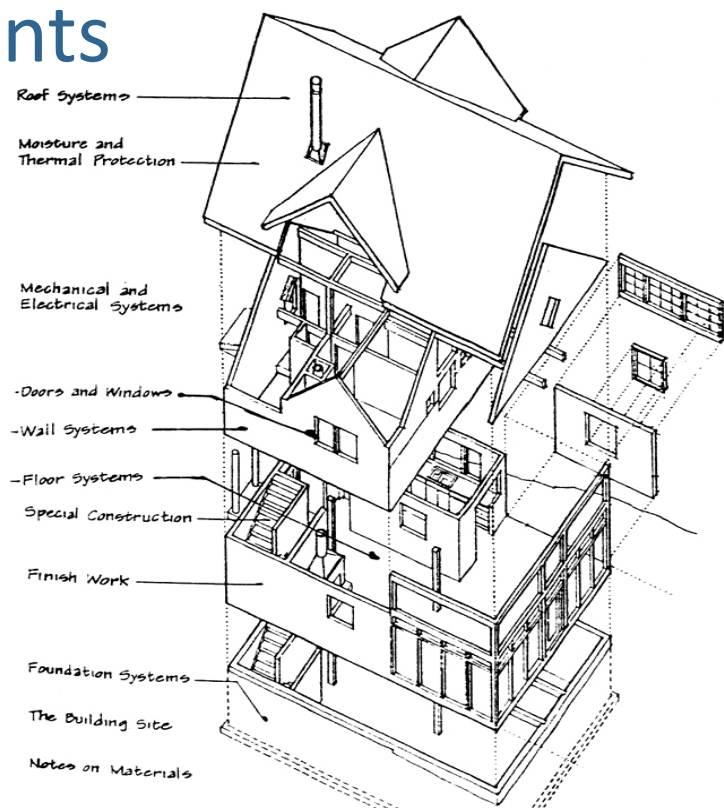
2. BUILDING BASICS

Building Elements

Buildings are composed of elements like foundations, walls and roofs.

A masonry wall is a building “Element.”

The bricks and mortar are the individual “components” of masonry walls.



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2. BUILDING BASICS

Key Elements Related to Leaks

A - Substructure

- A2020 Basement Walls (incl. Concrete, Masonry, etc.)
- A2025 Moisture Protection / Waterproofing

B - Superstructure

- B1004 Wood Framing & Hardware
- B1020 Roof Construction & Trusses
- B2010 Exterior Enclosure
- B2011 Exterior Enclosure: Stucco / Plaster
- B2012 Exterior Enclosure: Masonry Veneer
- B2013 Exterior Enclosure: Siding & Trim
- B2020 Windows
- B2022 Storefronts
- B2023 Curtain Walls / Exterior Glazing
- B2030 Exterior Doors
- B2040 Exterior Wall Flashing & Sheet metal
- B2050 Joint Sealants
- B2060 Exterior Coatings (Paint)

- B3000 Roofs
- B3004 Roof Flashing & Trim
- B3006 Gutters & Downspouts
- B3007 Waterproof Decks (Horizontal Waterproofing)

C - Interiors

- C3000 Interior Finishes (Damage)

D - Services

- D2000 Plumbing
- D3000 HVAC: Heating, Ventilating & Air-conditioning
- D5000 Electrical (Solar)

G - Building Sitework

- G2030 Pedestrian Paving
- G2042 Retaining Walls
- G2043 Fountains & Swimming Pools
- G2055 Fine Grading & Drainage



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2. BUILDING BASICS

A Sensible List

**“A PROBLEM WELL STATED IS A PROBLEM
HALF-SOLVED.”**

CHARLES KETTERING

© Lifehack Quotes



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2. BUILDING BASICS

Pete = Crazy Person



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2. BUILDING BASICS

Organizational Schemes

1. By Importance
2. Room-by-Room
3. SB800
4. Who Did the Work: Masterformat
5. Building Elements: Unifomat
(PFCS Standard)



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2. BUILDING BASICS

Uniformat

PFCS STANDARD

Level 1 Structure

- A. Substructure
- B. Superstructure
- C. Interiors
- D. Services
- E. Equipment & Furnishings
- F. Special Construction & Demolition
- G. Building Site work
- H. Other



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2. BUILDING BASICS

Uniformat

PFCS STANDARD

A. Superstructure

B 2010 Siding

- Leaks

- Incorrect Nailing

B 2060 Exterior Paint

- Deteriorated Trim

- Delaminating

B 3001 Roof

- Damage

- Leaks

- Missing Underlayment

B. Interiors

C 3011 Interior Paint

- Inadequate Coverage

- Wrong Color



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Date:	April 3, 2007
To:	[REDACTED]
From:	Pete Fowler Construction Services, Inc.
Project:	[REDACTED] Venice, CA 90291 PFCS Project # 06-295
Regarding:	Opinion Letter
Note:	Confidential Attorney-Client and Attorney Work Product. Protected under all applicable evidence codes.

Dear [REDACTED]:

Pete Fowler Construction Services, Inc. (PFCS) has analyzed documents and information related to roofing, waterproofing and water damage at [REDACTED], Venice, CA. Our findings are summarized in this preliminary report.

I. Project Summary

The project is a 3-level, 4-unit condominium building near the beach in Venice, CA constructed around 1988-89. The building occupies the entire lot except for minimum set-backs (5 to 10-feet) at all four elevations. Level 1 consists of individual parking garages accessed at the back elevation, storage rooms, a studio and an entry foyer to access the elevator to the second floor (Units A and B or 1 and 2) and the third floor (Units C and D or 3 and 4). The building has a low slope roof, roof-top deck areas, wood siding and stucco exterior building walls, and a slab-on-grade foundation. There are four balcony decks on front and four on the back elevations.

[REDACTED] is the owner of the top right unit (Unit C or 3). She purchased the building before completion and sold three of the units as condominiums. Low-slope roof replacement work and replacement of the roof-top deck areas was performed by an unlicensed roofer hired by the HOA during the winter of 2004-05. [REDACTED] reported dramatic leakage into her unit. There was additional leakage into the neighboring unit and the garage during the winter of 2005. This was due in part to the removal of the old roof and lack of protection during the rains. Although some repairs have been made the roof continues to leak into Units C and D (3 and 4). The owner is suing the HOA due to the leaks. There is interior damage and [REDACTED] has received estimates in the range of approximately \$100,000 for the interior repairs.

Summarized Timeline

04/07/89 [REDACTED] receives title to all units.
03/12/04 [REDACTED] has air conditioning installed on roof (over [REDACTED] protest) by Continental Refrigeration Heating & Air, Inc.
11/21/04 Roof tear-off begins (per [REDACTED] Rain falls. [REDACTED] video shows torrent of water infiltration.
11/23/04 [REDACTED] has un-permitted skylights installed in roof by Buzzell Design, an unlicensed contractor, despite violation of roof deck right warnings by [REDACTED]
9/12/06 [REDACTED] files First Amended Complaint against [REDACTED]

Observations

PFCS attended a visual inspection of building on November 2, 2006. At that time PFCS observed opposing party's expert's ([REDACTED]) water testing on the roof. Our on-site investigation included visual inspection of the building exteriors and the interiors of the two top floor units.

ROOF AND ROOF TOP DECK AREAS: The contractor who performed the work appears to have made no attempt to conform to industry or manufacturer's installation standards (see PFCS Issues List for details). The roof leaked dramatically during the rainy season of 2004 during the roofing work, and continues to leak to this day, as evidenced by the defense expert's testing in November 2006. In addition, the building is not being maintained in a way that will lead to acceptable performance going into the future.

INTERIORS: We observed damage from leakage at both interior units we visited. The [REDACTED] unit has not been repaired since the rains of 2004 and shows signs of significant water intrusion. The neighboring unit has been repaired but shows signs of continued leakage.

II. Analysis

Documents Reviewed

1. First Amended Complaint
2. Answer to First Amended Complaint (HOA, [REDACTED])
3. Repair estimates obtained by Plaintiff
4. First Amendment to the Condominium Plan
5. CD-Rom of roof, water leakage, skylights and air conditions photographs

Issues Summary – See Issues List for more details

1. Maintenance
2. Waterproofing – Decks (Roof-Top Decks)
3. Roofing
4. Skylights
5. Interior Finishes
6. Estimating/Budgeting
7. Other

Conclusions

The owner received proposals from several contractors for the interior repairs which are all approximately \$100,000. In addition, we estimate the cost to replace the roofing and roof top decks to be approximately \$133,000, including the design and coordination of this complicated work.

Recommendations

1. Hire a construction manager to coordinate all of the work of the various parties (Owners, Designer(s), Bidders, Contractor(s), Inspection, Manufacturer's Warrantee, Third Party Inspection, etc.)
2. Compose initial budgets and coordinate financing.
3. Hire an architect, roof consultant or building consultant to design the repairs.
4. Design and specify repairs. Compose a complete set of project drawings and documents.
5. Update Budget and initial (conceptual) schedule.
6. Pre-Qualify contractors for availability, interest, qualifications, references, etc.
7. Compose RFP documents and put the project out to bid
8. Contract with a single general contractor or multiple prime contractors including scope, costs, schedule, and terms. Coordinate this work with HOA's legal counsel.
9. Procure permits with the local municipality
10. Coordinate work
11. Coordinate third party inspection service or designer to verify the work is being installed in conformance with the design.
12. Coordinate final inspection.
13. Collect all project documentation and package for reference.
14. Compose maintenance program and coordinate.

III. PFCS Documents and Deliverables

1. OB Document Index
2. 5A Inspection Documentation
3. 5C Issues List
4. 5D PFCS Repair Estimate
5. 5E Estimate Summary

Aerial Image



Aerial 01.001 [REDACTED], Venice, CA 90291-8903



PF 01.006 PF 01- 006.jpg

Front elevation: [REDACTED] front elevation shot. Three floors (above grade), flat roof, wood siding and stucco walls. There are four balcony decks on front elevation, each with two scuppers.



PF 01.133 PF 01- 133.jpg Roof: General shot.



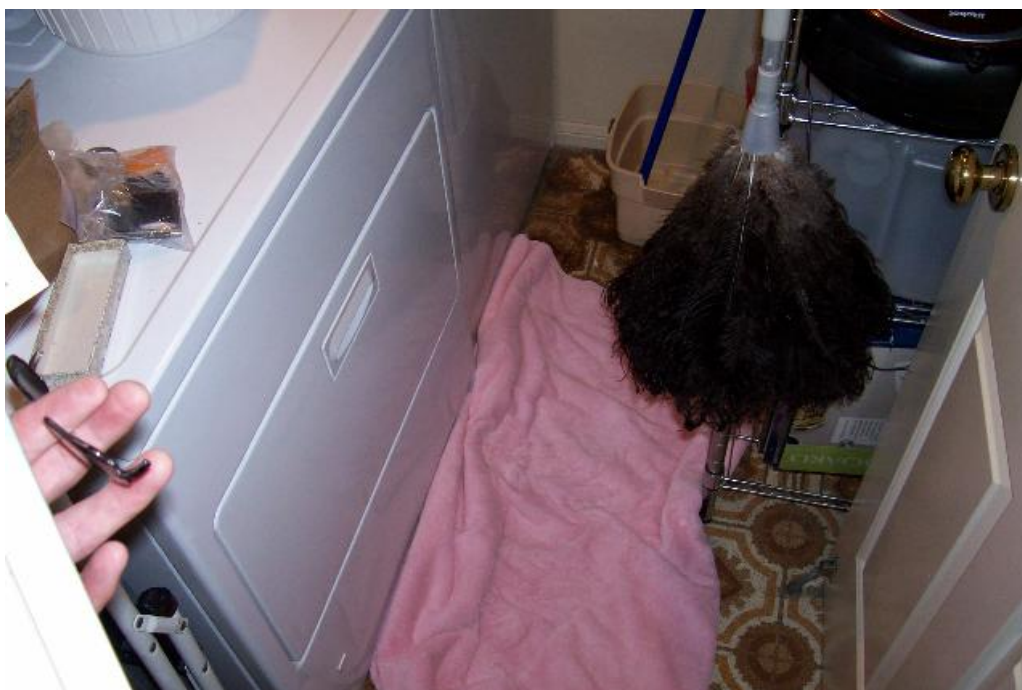
PF 01.135 PF 01- 135.jpg Roof test A: water is ponding around drain at right elevation near chimney.



PF 01.070 PF 01- 070.jpg Unit C dining room: Ceiling stains surrounding ceiling fan and above speaker. The floor is concrete.



PF 01.083 PF 01- 083.jpg Unit C kitchen: Ceiling damage.



PF 01.162 PF 01- 162.jpg Unit C laundry room: leaks at interior from test C. Test C water from vent - water on floor and dryer.



PF 01.097 PF 01- 097.jpg Unit C bedroom #2: ceiling stain at can light in center of room, at back and front.

3. INSPECTION

3. INSPECTION

Case Study: Leaky Condo - Deliverables

- Inspection & Testing Notes
- Issues List with Discussion/Responses
- Preliminary Estimate
- Estimate Summary of Estimates by Others
- Repair Estimate
- Opinion Letter with Recommendations
- Expert Witness Deposition



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3. INSPECTION

Case Study: Leaky Condo – Sample Deliverable

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4/3/2007

Issues List with Discussion

#	CSI Item	Issue / Description	Photo Reference	Discussion
27	L	Leaks at Neighboring Unit	PF 01.280	Repair interior damage.
28	M	Leaks at Elevator	PF 01.299	Repair interior damage.
29	N	Deteriorated Sheet Metal	PF 01.170, PF 01.198	See 07.30 J
30	O	Lack of Transition Flashing at Parapet Walls		See 07.30 J
31	P	Membrane: Ponding and end laps are not staggered minimum 3 feet	PF 01.137	See 07.30 J
32	Q	Inside and Outside Corners: Do not conform with manufacturer's instructions	PF 01.198, PF 01.211	See 07.30 J
33	R	Punctations: Do not conform with roofing manufacturer's instructions		See 07.30 J

Maintenance				
A	ATY Question: Your opinion, based on your inspection, as to whether there are any signs of damage due to roof leakage in any other areas of the building?			Yes: Levi unit on top floor, neighboring unit on top floor, and garage at first floor.
B	ATY Question: Your opinion as to the usual and customary frequency, if any, of common area drain clean out needed to avoid drain backup in lower level areas?			Roof maintenance should occur periodically and as problems arise. The frequency should increase as the roof gets closer to the end of its service life.
C	Deck Surfaces Need Maintenance			Private decks require maintenance.
D	Paint Needs Maintenance			Repainting of building exterior is required.
E	Rusting Sheet Metal			Repainting of building exterior is required and some sheet metal is deteriorated to the point that replacement is required. If maintenance is not performed the rate of deterioration will increase.

#	CSI Item	Plaintiff in the First Amendment to the Condominium Plan for roof deck purposes?	purposes.
47	09.00	Interior Finishes	
48	A	Interior ceiling damage at Level Unit	PF01.069-71, 083-085, 236-259
49	B	Cabinet damage	PF01.076-PF01.087
50	C	Unit D drywall damage at ceiling, walls and windows	PF01.284-PF01.289
51	D	Water Damage at Level 1 Unit C Garage	PF01.318-PF01.328
52	E	Damaged Furniture	Per Owner
53	F	Damaged Appliances	Per Owner
54	50.21	Estimating Budgeting	
55	A	ATY Question: Your opinion as to the cost of repair of Plaintiff's Unit 3 necessitated by water damage from roof leakage?	See Repair Estimate Summary document
56	99.99	Other	
57	A	Vents removed from side wall of elevator shaft at roof level and plastered over	PF 01.196
58	B	Electrical Problems	Per Owner
59	C	Deteriorating Stucco Patches at Elevator Shaft	PF 01.196
60	D	Sliding Glass Door at Front Elevators operates with difficulty	PF 01.416
61	E	HVAC Closet Requires Cleaning and Service	PF 01.467
62	F	Plumbing Problems at Level 1 Studio	PF 01.308

06-295
SE Issues List 07-04-02 B w- Responses.xls

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Page 2 of 2



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3. INSPECTION

Case Study: Leaky Condo – Invoice Summary

PFCS Client Access
Projects
Publications
Seminars
Users
Options
Logout

Project Info
Docs
Images
Photos
Accounting

Accounting

Type	Payor	Ref. No.	Claim No.	Date	Invoiced	Payments	Due	View
Retainer		2996		09/23/2006		1,000.00		
Invoice		06-295-2006-11-30		11/30/2006	1,605.00		1,605.00	
Invoice		06-295-2006-12-31		12/31/2006	782.00		782.00	
Invoice		06-295-2007-01-31		01/31/2007	2,597.50		2,597.50	
Invoice		06-295-2007-03-31		03/31/2007	4,408.00		4,408.00	
Invoice		06-295-2007-04-30		04/30/2007	4,042.15		-8,392.50	
Payment		7152		05/14/2007		12,434.65		
Invoice		06-295-2007-05-31		05/31/2007	0.00		0.00	
Totals:					\$13,434.65	\$13,434.65	\$0.00	

Payment Info

Pete Fowler Construction Services, Inc. (#113)
PO Box 3460
Portland, OR 97208-3460

Our Federal Tax ID Number is: **33-0690564**

[Download our W-9](#)

Credit Card Payment

Amount

[Pay with Card](#)



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3. INSPECTION

Property Condition Assessment

Property Condition Assessment

Property Condition Assessment Using ASTM E2018

Pete Fowler Construction Services, Inc.
July 2011

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1



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3. INSPECTION

ASTM E2018-08

ASTM SEMINAR

- ASTM offers a 2-day class for \$895
- The course includes an overview of the ASTM Property Condition Assessment (PCA) standard and explains why it was developed. It provides an excellent guide on how to use the standard to conduct a baseline property condition assessment and how to prepare a Property Condition Report (PCR).

GENERAL INFORMATION

- 25 pages total
- Cost is \$55
- Pages 1-16 are The Standard
- Pages 17-18 Enhanced Due Diligence
- Page 19 Sample PCR Table of Contents
- Pages 20-25 ADA Survey

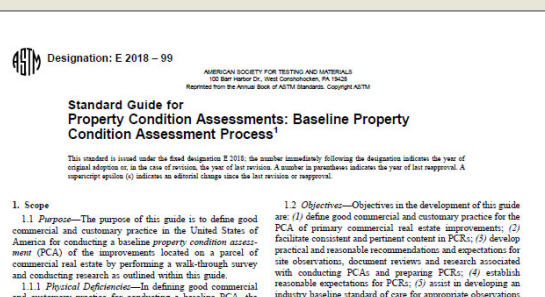
(<http://www.astm.org/>)



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3. INSPECTION

Scope, Purpose & Objectives



1. **1.2 Objectives**—Objectives in the development of this guide are to: (1) define good commercial and customary practice for the PCA of primary commercial real estate improvements; (2) facilitate consistent and pertinent content in PCRs; (3) develop pragmatic and reasonable recommendations and expectations for site observations, document reviews and research associated with conducting PCAs and preparing PCRs; (4) establish reasonable expectations for PCRs; (5) assist in developing an industry baseline standard of care for appropriate observations and research; and (6) recommend protocols for consultants for communicating observations, opinions, and recommendations in a manner meaningful to the user.



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3. INSPECTION

ASTM E2018-08 Sections

- | | |
|-----------------------------------|---|
| A. Scope | I. Opinions of Probable Costs to Remedy Physical Deficiencies |
| B. Terminology | J. Property Condition Report (PCR) |
| C. Significance and Use | K. Out of Scope Considerations |
| D. User's Responsibility | L. Annex A1: Specific Property Types |
| E. Property Condition Assessment | M. Appendix X1: Enhanced Due Diligence |
| F. The Consultant | N. Appendix X2: Americans with Disabilities Act |
| G. Document Review and Interviews | |
| H. Walk-Through Survey | |



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3. INSPECTION

Property Condition Assessment Process

There are 4 components to a Property Condition Assessment (section 5.2):

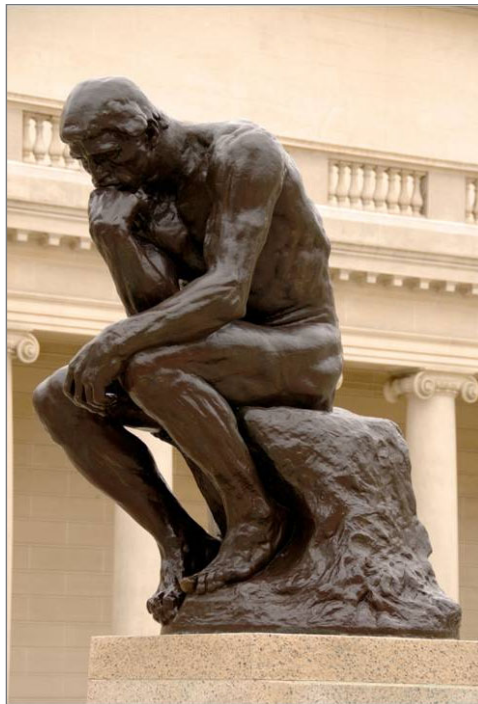
- Document Review and Interviews
- Walk-Through Surveys
- Preparation of Opinions of Probable Costs to Remedy Physical Defects
- Property Condition Report



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3. INSPECTION

Deep Thoughts & Hot Buttons



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[REDACTED]

Issues List with Discussion

#	CSI	Item	Issue / Description	Photo Reference	Discussion
1	01 93		Maintenance		
2		A	ATY Question: Your opinion, based on your inspection, as to whether there are any signs of damage due to roof leakage in any other areas of the building?		Yes: [REDACTED] unit on top floor, neighboring unit on top floor, and garage at first floor.
3		B	ATY Question: Your opinion as to the usual and customary frequency, if any, of common area drain clean out needed to avoid drain backup in lower level areas?		Roof maintenance should occur periodically and as problems arise. The frequency should increase as the roof gets closer to the end of its service life.
4		C	Deck Surfaces Need Maintenance	PF01.041-PF01.51	Private decks require maintenance.
5		D	Paint Needs Maintenance	PF01.040-050,	Repainting of building exterior is required.
6		E	Rusting Sheet Metal	PF01.040-PF01.050	Repainting of building exterior is required and some sheet metal is deteriorated to the point that replacement is required. If maintenance is not performed the rate of deterioration will increase.
7	07 25		Waterproofing - Decks (Roof-Top Decks)	PF 01.127-128, 132	
8		A	Bubbling Deck Coating	PF01.135-PF01-141	Remove and replace deck coating with new, in strict conformance with manufacturer's recommendations and in conformance with specialty design.
9		B	Peeling Deck Coating	PF 01.182	See 07 25 A
10		C	Deteriorating Deck Coating	PF 01.183	See 07 25 A
11		D	Improper Transitions from Deck to Roof	PF 01.172	See 07 25 A
12		E	Unworkmanlike application (coating material on building walls)	PF 01.190	See 07 25 A
13		F	Improper transitions at doors	PF 01.191	See 07 25 A
14		G	Deck coating not applied with regard to installation instructions. (Note: Roofer stated he did not know what water-proofing product was used at deck areas, says he used about four coats.)		See 07 25 A
15	07 30		Roofing		
16		A	ATY Question: What risks are inherent in failing to promptly replace a failing flat roof?		Leakage
17		B	ATY Question: What standard of care exists with respect to the selection of a roofing contractor to perform a roof replacement?		Contractor's licensing requires a minimum level of professionalism in contracting and this minimum threshold was not met.
18		C	ATY Question: What is the importance, if any, of whether or not the contractor is licensed?		Unlicensed contracting is against the law (for good reason).
19		D	ATY Question: What is the importance, if any, of whether or not a permit is obtained for the work?		Municipal permits are a minimum standard for the verification of contract performance in significant construction projects.
20		E	ATY Question: What is the importance, if any, of the financial wherewith all of the contractor?		Guarantees from unlicensed, uninsured contractors with no assets who do bad work and/or cause damage are meaningless. If there is nothing to lose, then there is no incentive to perform to the contract / performance requirements.
21		F	ATY Question: What is the standard of care regarding supervision or inspection of a contractor's work by an HOA board?		There needs to be some mechanism for verification that the work conforms with some reasonable standard.
22		G	ATY Question: What is the standard of care, if any, regarding having standby tarps available to protect residents when a roof is removed during the rainy season?		Protection of the property during re-roofing is always the responsibility of the roofer. Damage caused by a lack of protection during rains are the responsibility of the roofer.
23		H	ATY Question: Based on your inspection, was the roof installed in a manner meeting standards in the industry?		No. The roof leaks and there are many variations from the manufacturer's instructions.
24		I	ATY Question: Based on your inspection, does the roof still leak?	PF01.158-PF01.163	Yes.
25		J	Leaks at [REDACTED] Unit - 2004-Present		Remove and replace with new in strict conformance with manufacturer's recommendations and in conformance with specialty design.
26		K	Leaks During and After Testing	PF 01.158	Repair interior damage.

Issues List with Discussion

#	CSI	Item	Issue / Description	Photo Reference	Discussion
27		L	Leaks at Neighboring Unit	PF 01.280	Repair interior damage.
28		M	Leaks at Elevator	PF 01.299	Repair interior damage.
29		N	Deteriorated Sheet Metal	PF 01.170, PF 01.198	See 07 30 J
30		O	Lack of Transition Flashing at Parapet Walls		See 07 30 J
31		P	Membrane: Ponding and end laps are not staggered minimum 3 feet	PF 01.137	See 07 30 J
32		Q	Inside and Outside Corners: Do not conform with manufacturer's instructions	PF 01.198, PF 01.211	See 07 30 J
33		R	Penetrations: Do not conform with roofing manufacturer's instructions		See 07 30 J
34		S	Edge Flashing: Does not conform with roofing manufacturer's instructions		See 07 30 J
35		T	Counter Flashing: Deteriorated and does not conform with manufacturer's instructions		See 07 30 J
36		U	Roof to Wall: Does not conform with manufacturer's instructions	PF 01.166	See 07 30 J
37		V	Parapet Cap: Does not conform with industry or manufacturer's standards	PF 01.154, 153, 188	See 07 30 J
38		W	Parapet Cap: Lack of Integration of Stucco and Siding	PF 01.202, PF 01.209	See 07 30 J
39		X	Deck to Roof Transition: Does not conform with manufacturer's instructions	PF 01.148	See 07 30 J
40		Y	Water Heater Closet transitions Without Flashing	PF 01.234	See 07 30 J
41	08 50		Skylights	PF01.222-PF01.229	
42		A	ATY Question: Whether or not the skylights installed by [REDACTED] above his unit 4 (or D) interfere with the development of that area for roof deck use?		The skylights sit in the middle of the roof section.
43		B	ATY Question: Whether or not the skylights caused to be installed by [REDACTED] are improvements that require city permit?		The skylights do require a permit.
44		C	ATY Question: Whether or not engineering consultation should have occurred before the cutting through and removal of ceiling joists to accommodate the skylights?		May have; depending on the condition of the framing and the requirements of the building department.
45		D	ATY Question: Whether or not it would be feasible to remove the skylights installed by [REDACTED] and repair the section of the roof through which they were cut and the estimated cost of doing so?		The skylights can be removed, framing repaired, permit procured for repairs etc.
46		E	ATY Question: Whether or not the skylights installed by [REDACTED] invade the space reserved to Plaintiff in the First Amendment to the Condominium Plan for roof deck purposes?		Yes, the skylights invade the space reserved to Plaintiff for roof deck purposes.
47	09 00		Interior Finishes		
48		A	Interior ceiling damage at [REDACTED] Unit	PF01.069-71, 083-085, 236-259	Repair interior damage. See estimates by others.
49		B	Cabinet damage	PF01.076-PF01.087	Repair interior damage. See estimates by others
50		C	Unit 'D' drywall damage at ceiling, walls and windows	PF01.284-PF01.289	Repair interior damage. See estimates by others
51		D	Water Damage at Level 1 Unit C Garage	PF01.318-PF01.328	Repair interior damage. See estimates by others
52		E	Damaged Furniture	Per Owner	Repair interior damage. See estimates by others
53		F	Damaged Appliances	Per Owner	Repair interior damage. See estimates by others
54	50 21		Estimating/ Budgeting		
55		A	ATY Question: Your opinion as to the cost of repair of Plaintiff's Unit 3 necessitated by water damage from roof leakage?		See Repair Estimate Summary document
56	99 99		Other		
57		A	Vents removed from side wall of elevator shaft at roof level and plastered over	PF 01.196	Investigate issue and repair as necessary.
58		B	Electrical Problems	Per Owner	Included in the interior estimates
59		C	Deteriorating Stucco Patches at Elevator Shaft	PF 01.196	See Issue 99 99 A and Stucco repair in estimate.
60		D	Sliding Glass Door at Front Elevations operates with difficulty	PF 01-036	Included in the interior estimates
61		E	HVAC Closet Requires Cleaning and Service	PF 01-067	Included in the interior estimates
62		F	Plumbing Problems at Level 1 Studio	PF 01.308	Investigate issue and repair as necessary.

4. TESTING

4. TESTING

Evaluating Water Leakage of Buildings

Evaluating Water Leakage of Buildings

Evaluating Water Leakage of Buildings *Using ASTM E2128*

Pete Fowler Construction Services, Inc.
September 2012

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4. TESTING

Case Study – The Problem



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4. TESTING

Case Study – The Solution

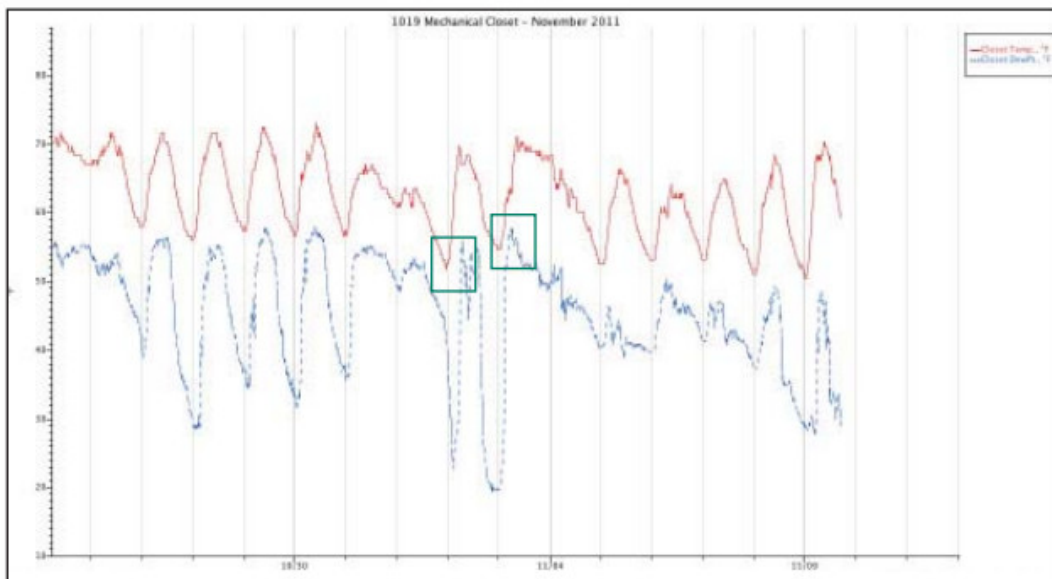


Fig. 16 November 2011 - Condensation is possible... Dew point rises quickly in the morning, while surfaces may still be cool
In late October and November, the temperature and dew point still rise and fall together. But note how they are much closer. If the dew point rises quickly, surfaces inside the closet may have remained cool enough to condense moisture, as could have been the case during the highlighted periods.



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Testing Map Using Random Selection



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4. TESTING

Evaluating Water Leakage of Buildings

A SYSTEMATIC APPROACH

- Review of Project Documents
- Evaluation of Design Concept
- Determination of Service History
- Inspection
- Investigative Testing
- Analysis
- Report Preparation



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4. TESTING

Building Performance Analysis

PFCS' Building Performance Analysis Method

1. Document and Information Management (Docs, Players, Timeline)
2. Meetings / Interviews with Key People
3. Building Information Management (Elements, Issues, Locations, Photos by Others)
4. Inspection
5. Analysis
6. Testing (Only As Necessary)
7. Estimate
8. Report / Property Condition Report (PCR)



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4. TESTING

Other Inspection & Testing Standards

- ASTM E1105 Standard Test Method for Field Determination of Water Penetration: 5 page test method; a procedure for determining the resistance to water penetration of windows and doors.
- AAMA 511-08 Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products: 11 pages. Offers a method & systematic approach for testing of fenestration products.
- AAMA 502-08 Voluntary Specification for Field Testing of Newly Installed Fenestration Products: 10 pages. Field test apparatus, sampling, test procedures and reports used in verifying water penetration resistance.
- PFCS Building Inspection and Testing: Our practices re: analysis of building performance from design, through construction and use.



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4. TESTING

Playing Doctor



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Construction Defect Claim

Resolved During Pre-Litigation Using Science

The Problem

The project was two, six-story condominium buildings with a total of 96 one story units, and located within 200 yards of the sea. When the project was three years old the Owners made a Builder's "Right to Repair" claim that included malfunctioning elevators, deteriorating paint, leaking drains in the parking garages, concrete sidewalks, and pool deck settlement, stucco cracks, leaks, and stains, buried weep screeds, reverse slope at flat roofs, corrosive sheet metal, improper drainage at planters, soil issues and too much water on one side of the fountain.

The most pressing allegation from the Owners' perspective was the malfunctioning elevators. The problem was real. The Owners hired a well-known and respected mechanical engineering expert consultant to examine the evidence, diagnose the problem, and prescribe a solution. He interviewed the sole-source contractor who had installed the elevators during construction and had (from our perspective) a one-sided maintenance contract with the Owners. The elevator contractor claimed that the problem was condensation in the elevator closets, which in turn was wetting the electronic equipment and causing the malfunctions, so they charged the Owners for each repair. The Owners' consultant assumed that the claims by the elevator contractor were true and specified adding expensive air conditioning units to the two elevator equipment closets.

The Solution

PFCS believed the elevator problem had been misdiagnosed, that the prescription was not going to cure the disease, and that the Owners would be saddled with a permanent maintenance burden related to new air conditioning units. Condensation problems like these are common in hot, humid climates like Florida, but rare in the West because the humidity levels are so much lower and the air typically does not hold enough moisture to turn into enough condensation (water) to cause problems. Lucky for us, there was a physicist on the HOA Board of Directors. He understood our argument and allowed us to conduct testing because he believed we were thinking hard to create a solution that was in the Owners' best interests.

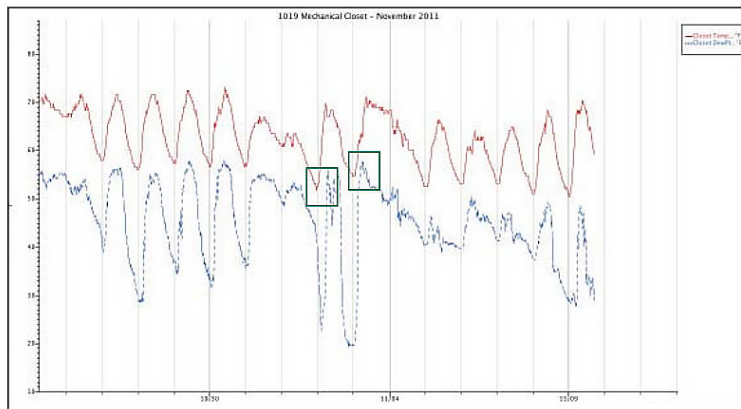


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CONSTRUCTION
Services, Inc.

Construction Defect Claim

We applied the PFCS Building Performance Analysis (BPA) Process:

1. **Document & Information Management:** We composed a 70-point Timeline of Elevator Events.
2. **Meetings & Interviews with Key People:** We interviewed all available "persons most knowledgeable".
3. **Building Information Management:** We collected all of the plans, specifications, photographs, project images, and information related to the elevator performance and organized it for analysis and presentation.
4. **Inspection:** We conducted on-site visual inspections.
5. **Analysis:** We analyzed all of the above and developed working hypothesis.
 - We engaged a world-renowned condensation and building moisture management expert and author to aid in testing and offer recommendations best suited for the building owners.
 - We engaged an elevator expert who was well versed in the problems the Owners were experiencing based on having solved many similar problems with this same elevator manufacturer.
6. **Testing:** We conducted a "hygrothermal study", collecting thousands of data points to measure the temperature and humidity over the course of many months.
7. **Estimate:** We monetized the recommendations applying our professional construction cost estimating skills.
8. **Report / Repair Recommendations:**
 - Our specialty building moisture management expert composed and delivered a report with recommendations.
 - Our specialty elevator expert composed and delivered a report with recommendations.
 - PFCS made elevator closet moisture management repair recommendations and composed and delivered an RFP that could be sent to contractors for bidding.
 - PFCS made repair recommendations for all other (traditional construction defect) issues.



November 2011 - Condensation is possible... Dew point rises quickly in the morning, while surface may still be cool

In late October and November, the temperature and dew point still rise and fall together. But note how they are much closer. If the dew point rises quickly, surfaces inside the closet may have remained cool enough to condense moisture, as could have been the case during the highlighted periods.

After months of hygrothermal testing, we concluded that it was possible that some limited condensation could have developed in the elevator closets. However, we were convinced (and so were the Owners) that the problem was primarily with the elevator installation and maintenance. Therefore, a much less expensive, more passive system was specified and installed to ensure no condensation could occur in the elevator closets, and the elevator expert directed repairs to the elevators that brought them into conformance with an acceptable standard of performance.

PFCS made recommendations that were presented to and accepted by the Owners for many of the other issues, and the developer paid for the execution of these repairs. In the end, the matter was settled without litigation.

5. MONETIZING

5. MONETIZING

Case Study – The Problem



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5. MONETIZING

Case Study – The Solution

9/6/2016

Estimate Comparison

Page 1 of 1

#	Description	PFCS Estimate	Estimate	Difference	Notes
1	Counters	\$ 5,782.22	\$ 9,172.93	\$ 3,390.71	*\$67.38/sf for granite
2	Cabinets	\$ 5,648.68	\$ 44,103.05	\$ 38,454.37	*Remove and Replace all cabinets in Kitchen *Remove and replace cabinets in dining room
3	Interior Paint	\$ 5,927.81	\$ 4,693.76	\$ (1,234.05)	
4	Floor Finishes	\$ 12,864.41	\$ 33,528.02	\$ 20,663.61	*\$16.16 for Exotic species floor *Remove and Replace Floor sheathing in all rooms
5	Plumbing	\$ 1,209.88	\$ 335.02	\$ (874.86)	
6	Electrical	\$ 809.88	\$ 338.66	\$ (471.22)	
7	Appliances		\$ 650.82	\$ 650.82	*Remove and reset all appliances
8	Cleaning		\$ 456.04	\$ 456.04	* Included in line items in PFCS estimate
9	Cont. Packing, handling, storage		\$ 19,294.15	\$ 19,294.15	*Remove and store furniture and all content at warehouse *Money for Lab work and evaluation of clothing/furniture
10	General Demo		\$ 12,723.94	\$ 12,723.94	*Demo all wood flooring and all cabinets in kitchen and dining room
11	Doors		\$ 150.01	\$ 150.01	
12	Drywall		\$ 321.63	\$ 321.63	*Small repair in kitchen area near sink, incl in PFCS in Cabinets
13	Ceramic Tile Floor		\$ 255.51	\$ 255.51	
14	Framing/Rough Carpentry		\$ 3,396.72	\$ 3,396.72	
15	Labor Only		\$ 3,451.71	\$ 3,451.71	
16	Paneling/Wood wall Finish		\$ 3,364.87	\$ 3,364.87	*Wood paneling in the kitchen area
17	Window Treatment		\$ 160.91	\$ 160.91	* Incl. in Paint in PFCS Estimate
18	SUB-TOTAL	\$ 32,242.88	\$ 136,397.75	\$ 104,154.87	
19					
20	Permits & Fees	\$ 433.68	\$ 18.19	\$ (415.49)	
21	Materials Sales Tax	\$ -	\$ 5,935.69	\$ 5,935.69	*This is included in line items in PFCS estimate
22	General Conditions	\$ 1,612.14			
23	Insurance and Bond	\$ 677.10			
24	Contingency on Construction Cost	\$ 2,065.16			
25	Overhead	\$ 3,385.50	\$ 14,235.43	\$ 10,849.93	
26	Profit	\$ 3,385.50	\$ 14,235.43	\$ 10,849.93	
27					
28	TOTAL	\$ 43,801.96	\$ 170,822.49	\$ 131,374.93	

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5. MONETIZING

IIACC Method

Issue: Describe the issue in English, so everyone who needs to use the information to make a decision can understand. What and where.

Investigation: What have we done to figure out how the assembly is performing? Inspection. Interviews. Document Review. Testing. Maps/Diagrams. Reports.

Analysis: What should be considered? Codes. Standards. Design intent. Maintenance Manual. Performance. Aesthetics.

Conclusion: What do we *think*? Should we consider politics?

Costs: What do all of the parties think it is going to cost to fix?



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5. MONETIZING

IIACC: Example

Issue: Windows are leaking and require complete removal and replacement of all for approximately \$1.5 million.

Investigation: PFCS observed visual evidence of leaks at most south-facing front elevation windows. We performed testing conforming with ASTM E2128 and AAMA 511 at 10% of the windows, selected at random.

Analysis: No damage was found at side or back elevations. Considering the age of the project, none should be expected going forward.

Conclusion: We recommend re-clad of the south elevation using a rain-screen system and replacement of the trim at 3 other elevations.

Cost: Approximately \$400,000.



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5. MONETIZING

Case Study

CASE STUDY:
COMMERCIAL



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5. MONETIZING

Case Study

CASE STUDY:
COMMERCIAL

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South Beach Investments v. Paras

4/10/2008

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Estimate Summary

#	Issue	Description	Notes	Qty	Unit	Direct Cost	Direct Cost	Project Cost
							Total	Total
1	01 71	Cleaning		1	hr	4,397.18	\$	4,397.18
2	01 40	Demolition		1	hr	4,371.5	\$	26,251.50
3	02 40	Facility Remediation & Abatement		1	hr	5,000.00	\$	5,000.00
4	01 00	Demolition		1	hr	15,217.50	\$	15,217.50
5	06 10	Rough Carpentry		1	hr	69,544.12	\$	69,544.12
6	06 20	Finish Carpentry		1	hr	11,217.5	\$	11,217.50
7	07 20	Thermal Protection & Insulation		1	hr	14.18	\$	85,168.08
8	07 40	Roofing		1	hr	14.18	\$	132,680.22
9	07 41	Roofing & Sheet Metal		1	hr	14.18	\$	132,680.22
10	07 71	Roof Gutters		1	hr	14.18	\$	132,680.22
11	07 92	Roof Scaffolding		1	hr	14.18	\$	132,680.22
12	08 50	Windows		1	hr	14.18	\$	132,680.22
13	09 21	Exterior Board (incl. Interior Plaster)		1	hr	14.18	\$	132,680.22
14	09 40	Plumbing		1	hr	14.18	\$	132,680.22
15	09 50	Plumbing and Cooling		1	hr	14.18	\$	132,680.22
16	11 11	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
17	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
18	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
19	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
20	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
21	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
22	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
23	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
24	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
25	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
26	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
27	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
28	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
29	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
30	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
31	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
32	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
33	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
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35	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
36	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
37	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
38	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
39	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
40	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
41	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
42	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
43	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
44	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
45	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
46	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22
47	11 40	Heating, Ventilating, and Air Conditioning		1	hr	14.18	\$	132,680.22

40	Permits & Fees	1%	\$	3,344.35
41	Relocation	None		
42				
43	Subtotal of Other Project Costs		\$	51,266.09
44	Contingency on Other Project Costs	0%		
45	Total of Other Project Costs		\$	51,266.09
46				
47	Total Estimated Project Cost		\$	405,700.99
			\$	405,700.99

34	Remove existing wall
35	Remove existing wall
36	Remove existing wall
37	Remove existing wall
38	Remove existing wall
39	Remove existing wall
40	Remove existing wall
41	Remove existing wall
42	Remove existing wall
43	Remove existing wall
44	Remove existing wall
45	Remove existing wall
46	Remove existing wall
47	Remove existing wall

4/11

Estimate Summary (4/11/2008)

05-131

05 Preliminary Estimate (05-131-0)

For mutation projects only.
Detailed estimate of applicable items only.

Page 3 of 9

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5. MONETIZING

Estimating Basics

IDENTIFY OR ESTIMATE ALL COSTS

- Remember the 100% Rule
- Costs are always an issue in solving building problems. But, it is my experience that cost is often not the primary issue, even if it appears to be.
- To figure out project costs, we need to identify the steps between “where we are” and “where we want to be” and estimate the cost of the steps; it is not as hard as most people make it out to be. This is the heart of solving building problems. Like the Issues List, we can usually identify 5 to 15 steps that will move the situation to conclusion.



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5. MONETIZING

Estimating Basics

ESTIMATING V. PRICING

Estimating

- Direct, Real or Hard Costs
- Indirect, Overhead Costs
- Other Project Costs

Pricing

- Competition
- Availability
- Personal Relationships
- Access to Site
- Payment Dependability



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5. MONETIZING

Estimating Basics

5 LEVELS – 10 STEPS

www.petefowler.com 3/10/2009

Level 5 Estimating
5 Levels - 10 Steps

Line	Steps	Level 1 Order of Magnitude	Level 2 Conceptual	Level 3 Preliminary	Level 4 Detailed	Level 5 Bid / Construction / Trial
1	Format	Summary Sheet Only	Add capital letters (or numbers if L1 are letters) with 2 to 15 items under each of the main categories	Conform with the WBS rules: Main Category, then capital letters or numbers, then alternate with each new level	See PFCS Samples for deeper and deeper levels. Conform to rules of WBS.	Final Pass for clarity and ease of making references and following all of the component parts.
2	Scope	A Level 1 Work Breakdown Structure (WBS): 1 paragraph to 1 page. There are only basic quantities (no real QTO) in approximate figures	Add details with 2-10 categories each with letters and CSI codes. Basic QTO on main items (SF, FA, LF, etc.) Usually not calculated units like Cubic Yards (CY)	Level 3 WBS with letters, numbers, and CSI codes. More detailed QTO.	Complete, detailed QTO.	Final Pass. Check QTO on key items.
3	Time Labor	Little or no breakdown of labor / time in this step	Rough Estimate, Typical crews, Round numbers, slightly over estimating. No calls	Productivity rates, Use Walker's book on big #s	Use Walker's Labor Rates	Final Pass
4	Material	A guesstimate. Little QTO, Quantities only - not cost of materials. Assembly level estimates at the most	QTO, Rough Estimate, Slightly over estimating. Books only for big #s, NO calls unless faster than book	Calls, Books, Maybe Alternatives	Calls, Bids, Alternatives refined	Final Pass
5	Equipment	WAG. Often none	Rough Estimate, No Calls	Calls, Books	Calls, Books, Bids	Final Pass
6	Subs	Unit prices, WAG, Use books only on BIG #s	Books, NO calls	Some Calls	Lots of Calls, Maybe send info, Maybe Bids	Final Pass
7	GC's	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Broken Down	Same as L4
8	OH	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Possibly Broken Down	Same as L4
9	Profit	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Reconsider % or Amount	Reconsider % or Amount
10	Non-Construction	WAG	SWAG	More Support	More Support	Calls Bids
11	Time:	1-4 Hours	2-24 Hours	16-100 Hours	50-200 Hours	100+ Hours



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5. MONETIZING

Level 1 Estimating

CASE STUDY: 10 STEPS: LEVEL 1

- | | |
|---|--|
| 1. <u>Format</u> : Summary Sheet only. | 6. <u>Independent Subcontractors</u> : Unit prices, WAG, Use books only on BIG #'s |
| 2. <u>Scope</u> : A Level 1 WBS: 1 paragraph to 1 page. There are only basic quantities (no real QTO) in approximate figures. | 7. <u>General Conditions</u> : % of Direct Cost |
| 3. <u>Time (Labor)</u> : Little or no breakdown of labor / time in this step. | 8. <u>Internal (Overhead) Costs</u> : % of Direct Cost |
| 4. <u>Materials</u> : A guesstimate. Little QTO, Quantities only - not cost of materials. Assembly level estimates at the most. | 9. <u>Profit</u> : % of Direct Cost |
| 5. <u>Equipment</u> : WAG. Often none. | 10. <u>Non-Construction (Other) Costs</u> : WAG |

(See 5 Levels – 10 Steps Matrix for comparison)



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5. MONETIZING

Level 1+ Estimating

CASE STUDY:
MULTI-FAMILY
RESIDENTIAL



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5. MONETIZING

Level 1+ Estimating

CASE STUDY: MULTI-FAMILY RESIDENTIAL

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Brown's Manor v D.R. Horton
Estimate Details

1/2/2007

Line	CSI	Description	Notes / Ref.	Qty	Unit	Crew	Hrs	Unit Cost				Direct Cost				Total Cost	Total Item
								Labor	Material	Other	Subc.	Labor	Material	Other	Subc.		
1																	
2	A	Grading and Landscaping															
3																	
4	1	Grading next to the buildings does not allow for proper drainage		3	loc												
5		at building		1	loc	SW4	1	55.16	100.00								
6		at driveway and storm planning		1	loc	SW4	1	55.16									
7		at drainage area to accommodate drainage		1	loc	SW4	2	110.33									
8		at driveway planning		1	loc	SW4	2	110.33	100.00								
9		at Repair irrigation as necessary		1	loc	SW4	1	55.16	10.00								
10		at from top		1	loc	SW4	1	55.16	10.00								
11																	
12		Additional Location		1	loc							661.22				661.22	
13																	
14	2	Construction debris has not been removed from the site		0	sq												
15																	
16	3	Construction silt fence has not been removed from the site															
17																	
18	4	Debris has not been removed from the rain drain piping		0	sq												
19																	
20	5	Wood fence boards are buried in the ground		0	sq												
21																	
22	6	Crawl space ventilation. Must seal below vapor barrier.															
23																	
24	B	Concrete Walks and Patios															
25																	
26	1	The top surfaces of the concrete walks and concrete porches are too high		0	sf												
27																	
28	2	The concrete walks and concrete porches at some of the units were placed after the siding was installed embedding the siding and trim in the concrete		0	sf												
29																	
30	3	Concrete forms have been left in place		0	loc												
31																	
32	4	Concrete wall form ties have been left in place		1	sq	RC3	8	300.48	100.00								
33																	

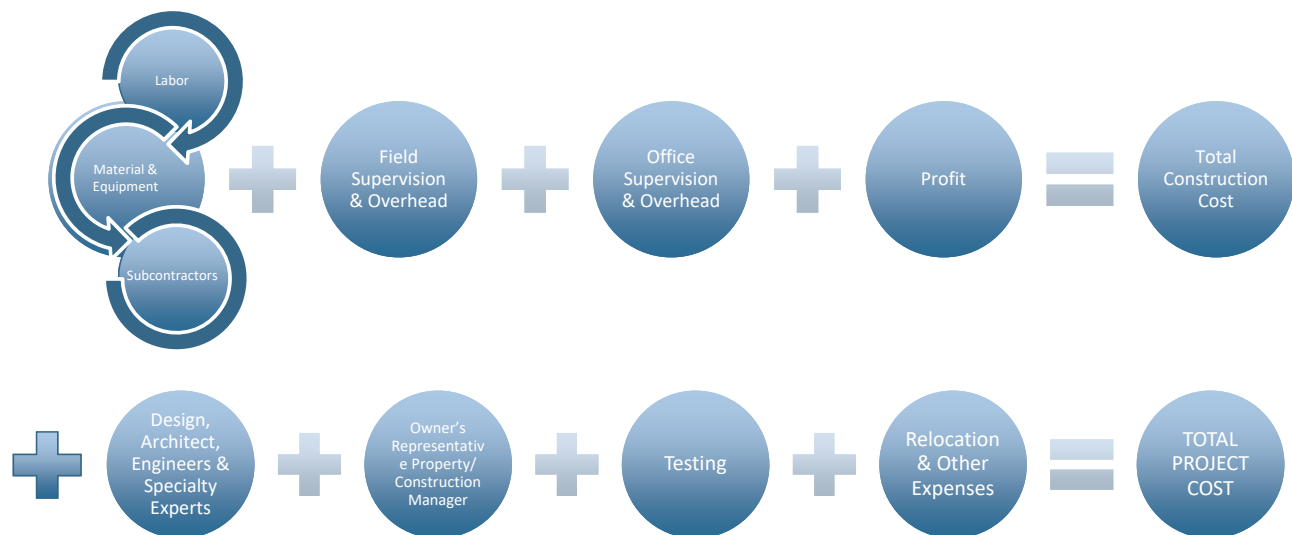
193		Permits & Fees		1%													
194		Relocation		0													
195																	
196		Subtotal of Other Project Costs															
197		Contingency on Other Project Costs		5%													
198		Total of Other Project Costs															
199																	
200		Total Estimated Project Cost															

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5. MONETIZING

Level 2+ Estimating

CONSTRUCTION COST FLOW CHART



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5. MONETIZING

Allocation of Responsibility



Read about industry impacts on our blog at www.petefowler.com

Preliminary Estimate

Pete Fowler Construction Services, Inc.

Project Number: 06-295

Project Name: [REDACTED]

Address: Venice, CA

Date: 4/3/2007

Estimator: Pete Fowler/Tim Hewett

Preliminary Estimate Contents

- 1 Preliminary Estimate Summary
- 2 Preliminary Estimate Details
- 3 Labor Rates
- 4 Quantity Take Off
- 5 Calls, Sub-Bids, Materials

Estimate Summary

#	CSI #	Description	Notes	Qty.	Unit	Direct Cost Total	Project Cost Total
1	01 74 00	Cleaning and Waste Management		1	ls	\$ 1,030.58	\$ 2,189.72
2	06 10 00	Rough Carpentry		1	ls	\$ 4,132.54	\$ 8,780.59
3	07 25 00	Waterproofing - Decks		1	ls	\$ 3,566.16	\$ 7,577.18
4	07 30 00	Roofing		1	ls	\$ 10,979.53	\$ 23,328.69
5	07 46 00	Siding		1	ls	\$ 3,430.16	\$ 7,288.22
6	07 61 00	Flashing and Sheet Metal		1	ls	\$ 8,789.70	\$ 18,675.86
7	08 10 00	Doors and Frames		1	ls	\$ 693.58	\$ 1,473.68
8	08 50 00	Windows (Skylights)		1	ls	\$ 720.58	\$ 1,531.05
9	09 24 24	Stucco		1	ls	\$ 1,119.97	\$ 2,379.65
10	09 90 00	Painting and Coating		1	ls	\$ 3,303.19	\$ 7,018.44
11	22 00 00	Plumbing		1	ls	\$ 2,611.16	\$ 5,548.05
12	23 00 00	Heating, Ventilating, and Air-Conditioning (HVAC)		1	ls	\$ 2,350.00	\$ 4,993.15
13	26 00 00	Electrical		1	ls	\$ 2,350.00	\$ 4,993.15
14	32 31 00	Fences and Gates		1	ls	\$ 12,028.51	\$ 25,557.50
15	ALT #1	Investigate vent leaks at elevator shaft		1	ls	\$ 2,000.00	\$ 4,249.49
16	ALT #2	Reframe two large skylights		1	ls	\$ 1,155.22	\$ 2,454.54
17	ALT #3	Investigate plumbing at Level 1 studio		1	ls	\$ 2,500.00	\$ 5,311.86
18							
19		Direct Cost Total				\$62,760.88	\$ 133,350.82
20							
21		General Conditions		8.0%		\$5,020.87	
22		Subtotal				\$67,781.75	
23							
24		Contractor's Overhead		8%		\$5,422.54	
25		Contractor's Profit		10%		\$6,778.17	
26		Insurance & Bond		2%		\$1,355.63	
27							
28		Subtotal				\$81,338.10	
29		Contingency on Construction Costs		10%		\$8,133.81	
30		Total Estimated Construction Costs				\$89,471.91	
31							
32		Other Project Costs:					
33		Construction Management		1	ls	\$15,000.00	
34		Architectural / Drafting / Design		1	ls	\$20,000.00	
35		Engineering Design		1	ls	\$0.00	
36		Testing & Inspection		1	ls	\$5,000.00	
37		Permits & Fees		2%		\$1,789.44	
38		Relocation	Not Included				
39							
40		Subtotal of Other Project Costs				\$41,789.44	
41		Contingency on Other Project Costs		5%		\$2,089.47	
42		Total of Other Project Costs				\$43,878.91	
43							
44		Total Estimated Project Cost				\$133,350.82	\$133,350.82

[REDACTED]

Estimate Details

Line	CSI #	Description	Notes / Ref	Qty	Unit	Crew	Hrs	Unit Cost				Direct Cost				Total Cost	Total Item
								Labor	Material	Other	Subc	Labor	Material	Other	Subc		
1																	
2	01 74 00	Cleaning and Waste Management										-	-	-	-	\$0 00	\$1,030 58
3		Final Clean Up		1	ea	RC1&3	8	680 58	50 00	300 00		681	50	300	-	\$1,030 58	
4												-	-	-	-	\$0 00	
5	06 10 00	Rough Carpentry										-	-	-	-	\$0 00	\$4,132 54
6		Protect surrounding area		1	ea	RC1&3	1	85 07	10 00			85	10	-	-	\$95 07	
7		Repair damaged sheathing/framing at roof area	allowance	1	ea	RC1&3	8	680 58	200 00			681	200	-	-	\$880 58	
8		Repllace sheathing at deck area		360	sf	RC1&3	16	3 78	2 00			1,361	720	-	-	\$2,081 16	
9		Repair damaged framing at wall planes	allowance	1	ea	RC1&3	4	340 29	100 00			340	100	-	-	\$440 29	
10		Frame curb at water proof deck		1	ea	RC1&3	5	425 36	100 00			425	100	-	-	\$525 36	
11		Clean area		1	ea	RC1&3	1	85 07	25 00			85	25	-	-	\$110 07	
12												-	-	-	-	\$0 00	
13	07 25 00	Waterproofing - Decks										-	-	-	-	\$0 00	\$3,566 16
14		Protect surrounding area		1	ea	RC1&3	1	85 07	25 00			85	25	-	-	\$110 07	
15		Remove existing decking		360	sf	RC1&3	6	1 42	0 50			510	180	-	-	\$690 44	
16		Prepare substrate		360	sf	RC1&3	8	1 89	0 50			681	180	-	-	\$860 58	
17		Install new elastomeric deck coating	Pg 155 Sweets 2007	360	sf	SUB	0	0 00			5 00	-	-	-	1,800	\$1,800 00	
18		Clean area		1	ea	RC1&3	1	85 07	20 00			85	20	-	-	\$105 07	
19												-	-	-	-	\$0 00	
20	07 30 00	Roofing										-	-	-	-	\$0 00	\$10,979 53
21		Protect surrounding area		1	ea	RC1&3	4	340 29	50 00			340	50	-	-	\$390 29	
22		Remove HVAC, electrical, plumbing as needed	See Below	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
23		Remove existing roofing	O=dump	3,325	ea	RC1&3	16	0 41		0 50		1,361	-	1,663	-	\$3,023 66	
24		Repair substrate as needed	See Rough Carpentry	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
25		Install flashing as needed	See Sheet Metal	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
26		Install mineral fiber cant-strip	allowance-Sweets pg168	500	lf	SUB	4	0 68			1 70	340	-	-	850	\$1,190 29	
27		Install new 2-ply roofing	allowance-Sweets pg168	3,325	ea	SUB	0	0 00			1 80	-	-	-	5,985	\$5,985 00	
28		Clean area		1	ea	RC1&3	4	340 29	50 00			340	50	-	-	\$390 29	
29												-	-	-	-	\$0 00	
30	07 46 00	Siding										-	-	-	-	\$0 00	\$3,430 16
31		Protect surrounding area		1	ea	RC1&3	1	85 07	5 00			85	5	-	-	\$90 07	
32		Remove siding		536	sf	RC1&3	3	0 48		0 50		255	-	268	-	\$523 22	
33		Install flashing as needed	See Sheet Metal	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
34		Install weather resistive barrier	Sweets pg 156	536	sf	SUB	0	0 00			1 80	-	-	-	965	\$964 80	
35		Install new siding	RS Means pg 074-3	536	sf	SUB	0	0 00			3 25	-	-	-	1,742	\$1,742 00	
36		Clean area		1	ea	RC1&3	1	85 07	25 00			85	25	-	-	\$110 07	

[REDACTED]

Estimate Details

Line	CSI #	Description	Notes / Ref	Qty	Unit	Crew	Hrs	Unit Cost				Direct Cost				Total Cost	Total Item
								Labor	Material	Other	Subc	Labor	Material	Other	Subc		
37												-	-	-	-	\$0 00	
38	07 61 00	Flashing and Sheet Metal										-	-	-	-	\$0 00	\$8,789 70
39		Protect surrounding area		1	ea	RC1&3	1	85 07	20 00			85	20	-	-	\$105 07	
40		Install cap		335	lf	RC1&3	5	1 27	3 00			425	1,005	-	-	\$1,430 36	
41		Install drip edge		126	lf	SUB	2	1 35	2 00			170	252	-	-	\$422 15	
42		Install L-metal		126	lf	SUB	3	2 03	2 00			255	252	-	-	\$507 22	
43		Install counter flashing		126	lf	RC1&3	4	2 70	2 00			340	252	-	-	\$592 29	
44		Install pitch pockets/fill		30	ea	RC1&3	3	8 51			40 00	255	-	-	1,200	\$1,455 22	
45		Re - Install fire place cap		2	ea	RC1&3	2	85 07	10 00			170	20	-	-	\$190 15	
46		Install sill pan		4	ea	RC1&3	3	63 80	100 00			255	400	-	-	\$655 22	
47		Install miscellaneous flashing	allowance	1	ea	RC1&3	24	2,041 74	1,000 00			2,042	1,000	-	-	\$3,041 74	
48		Clean area		1	ea	RC1&3	4	340 29	50 00			340	50	-	-	\$390 29	
49												-	-	-	-	\$0 00	
50	08 10 00	Doors and Frames										-	-	-	-	\$0 00	\$693 58
51		Protect surrounding area		1	ea	RC1&3	0 5	42 54	5 00			43	5	-	-	\$47 54	
52		Remove existing doors and frames - save		4	ea	RC1&3	3	63 80				255	-	-	-	\$255 22	
53		Set sill pan	See Sheet Metal	4	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
54		Re-install doors and frames		4	ea	RC1&3	4	85 07	2 00			340	8	-	-	\$348 29	
55		Clean area		1	ea	RC1&3	0 5	42 54				43	-	-	-	\$42 54	
56												-	-	-	-	\$0 00	
57	08 50 00	Windows (Skylights)										-	-	-	-	\$0 00	
58		Protect surrounding area		1	ea	RC1&3	0 5	42 54	5 00			43	5	-	-	\$47 54	\$720 58
59		Remove existing - save		6	ea	RC1&3	2	28 36				170	-	-	-	\$170 15	
60		Install BUR	See Roofing	6	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
61		Reinstall skylights		6	ea	RC1&3	5	70 89	5 00			425	30	-	-	\$455 36	
62		Clean area		1	ea	RC1&3	0 5	42 54	5 00			43	5	-	-	\$47 54	
63												-	-	-	-	\$0 00	
64	09 24 23	Stucco										-	-	-	-	\$0 00	\$1,119 97
65		Protect surrounding area		1	ea	RC1&3	1	85 07	10 00			85	10	-	-	\$95 07	
66		Remove stucco		120	sf	RC1&3	5	3 54		1 00		425	-	120	-	\$545 36	
67		Install flashings	See Sheet Metal	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
68		Install 3 coat stucco	Sweets pg 211	120	sf	SUB	0	0 00			3 60	-	-	-	432	\$432 00	
69		Clean area		1	ea	RC1&3	0 5	42 54	5 00			43	5	-	-	\$47 54	
70												-	-	-	-	\$0 00	
71	09 90 00	Painting and Coating										-	-	-	-	\$0 00	\$3,303 19
72		Protect surrounding area		1	ea	RC1&3	4	340 29	25 00			340	25	-	-	\$365 29	
73		Prime/Paint siding	Sweets pg 233 & 234	536	sf	SUB	0	0 00			0 64	-	-	-	343	\$343 04	

[REDACTED]

Estimate Details

								Unit Cost				Direct Cost				Total	Total
Line	CSI #	Description	Notes / Ref	Qty	Unit	Crew	Hrs	Labor	Material	Other	Subc	Labor	Material	Other	Subc	Cost	Item
74		Prime/Paint stucco	Sweets pg 234	1,296	sf	SUB	0	0 00		0 50	0 89	-	-	648	1,153	\$1,801 44	
75		Prime/Paint doors	Sweets pg 231 O=Eqp	140	sf	SUB	0	0 00			1 05	-	-	-	147	\$147 00	
76		Prime/Paint frames	Sweets pg 231	62	lf	SUB	0	0 00			1 63	-	-	-	101	\$101 06	
77		Prime/Paint F P cap		2	ea	RC1&3	4	170 15	50 00			340	100	-	-	\$440 29	
78		Clean area		1	ea	RC1&3	1	85 07	20 00			85	20	-	-	\$105 07	
79												-	-	-	-	\$0 00	
80	22 00 00	Plumbing										-	-	-	-	\$0 00	\$2,611 16
81		Remove/cap existing	allowance	1	dy	RC1&3	0	0 00			500 00	-	-	-	500	\$500 00	
82		Reset/repair existing	allowance	1	dy	RC1&3	0	0 00	50 00		500 00	-	50	-	500	\$550 00	
83		Install new drains to existing at decks		2	dy	RC1&3	16	680 58	100 00			1,361	200	-	-	\$1,561 16	
84												-	-	-	-	\$0 00	
85	23 00 00	HVAC										-	-	-	-	\$0 00	\$2,350 00
86		Remove existing	allowance	1	dy	RC1&3	0	0 00			750 00	-	-	-	750	\$750 00	
87		Reset existing	allowance	2	dy	RC1&3	0	0 00	50 00		750 00	-	100	-	1,500	\$1,600 00	
88												-	-	-	-	\$0 00	
89	26 00 00	Electrical										-	-	-	-	\$0 00	\$2,350 00
90		Remove/cap existing	allowance	1	dy	RC1&3	0	0 00			750 00	-	-	-	750	\$750 00	
91		Reset/repair existing	allowance	2	dy	RC1&3	0	0 00	50 00		750 00	-	100	-	1,500	\$1,600 00	
92												-	-	-	-	\$0 00	
93	32 31 00	Fences and Gates										-	-	-	-	\$0 00	\$12,028 51
94		Protect surrounding area		1	ea	RC1&3	0	0 00	13 00			-	13	-	-	\$13 00	
95		Remove existing - dispose		38	lf	RC1&3	4	8 96				340	-	-	-	\$340 29	
96		Install new curb	See RC/Roofing	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
97		Re-install railing		76	lf	SUB	0	0 00	150 00			-	11,400	-	-	\$11,400 00	
98		Set/fill pitch pockets	See Sheet Metal	1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
99		Touch up painting		1	ea	RC1&3	3	255 22	20 00			255	20	-	-	\$275 22	
100		Clean area		1	ea	RC1&3	0	0 00				-	-	-	-	\$0 00	
101												-	-	-	-	\$0 00	
102	ALT #1	Investigate Vent Leaks										-	-	-	-	\$0 00	\$2,000 00
103		Investigate leaks	allowance	1	ls	SUB	0	0 00			2,000 00	-	-	-	2,000	\$2,000 00	
104												-	-	-	-	\$0 00	
105	ALT #2	Reframe Skylights										-	-	-	-	\$0 00	\$1,155 22
106		Structural investigation	allowance	1	ls	SUB	0	0 00			500 00	-	-	-	500	\$500 00	
107		Reframe skylights	allowance	2	ea	RC1&3	3	127 61	200 00			255	400	-	-	\$655 22	
108												-	-	-	-	\$0 00	
109	ALT #3	Investigate Plumbing										-	-	-	-	\$0 00	\$2,500 00
110		Investigate plumbing	allowance	1	ls	SUB	0	0 00			2,500 00	-	-	-	2,500	\$2,500 00	
111																	
112		Total										17,057	17,487	2,999	25,218	\$62,760 88	\$62,760 88

[REDACTED]

Labor Rates - S-CA 2005

	Code	Unit	Rate	Description												Asst.				
				Laborer			Carpenter			Conc. Fin.			Roofer			Project	Project			
				App	Jou	For.	App	Jou	For.	App	Jou	For.	App	Jou	For.	Manager	Manager	Supt.	Average	
1	Cost Unburdened			12 00	15 00	22 50	15 00	30 00	40 00	15 00	30 00	35 00	15 00	25 00	30 00	25 00	45 00	40 00	26 30	
2	Health Care	\$0	/Hr	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
3	Vacation	\$0	/Hr	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
4	Education	\$0 00	/Hr	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
5	Fica	7 65%	%	0 92	1 15	1 72	1 15	2 30	3 06	1 15	2 30	2 68	1 15	1 91	2 30	1 91	3 44	3 06	2 01	
6	State	0 00%	%	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
7	Federal Unemp	0 80%	%	0 10	0 12	0 18	0 12	0 24	0 32	0 12	0 24	0 28	0 12	0 20	0 24	0 20	0 36	0 32	0 21	
8	Futa	8 00%	%	0 96	1 20	1 80	1 20	2 40	3 20	1 20	2 40	2 80	1 20	2 00	2 40	2 00	3 60	3 20	2 10	
9	SDI	0 00%	%	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
10	State Unemp	3 50%	%	0 42	0 53	0 79	0 53	1 05	1 40	0 53	1 05	1 23	0 53	0 88	1 05	0 88	1 58	1 40	0 92	
11	Workman's Comp BLW \$21	48 00%	%	5 76	7 20		7 20			7 20						1 25	2 25		5 14	
12	Workman's Comp ABV \$21	16 00%	%			3 60		4 80	6 40		4 80	5 60						6 40		
13	Roofer BLW \$21	75 00%	%										11 25							
14	Roofer ABV \$21	50 00%												12 50	15 00					
15	Vehicle	\$0	%	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
16	Liability Insurance	10 00%	%	1 20	1 50	2 25	1 50	3 00	4 00	1 50	3 00	3 50	22 50	37 50	45 00	2 50	4 50	4 00	9 16	
17																				
18	Burdened \$/Hr.			21.35	26.69	32.84	26.69	43.79	58.38	26.69	43.79	51.08	51.74	79.99	95.99	33.74	60.73	58.38	79.10	
19	Percent Overhead			44%	44%	31%	44%	31%	31%	44%	31%	31%	71%	69%	69%	26%	26%	31%	69 38%	Crew Cost
20																				
21																			Crew Cost	per Hour
22																			per Hour	w/ 20% O&P
23	Demolition																			
24	D 1				1														\$26.69	\$32.03
25	D 2			1	1														\$48.05	\$57.66
26	D 3				2														\$53.39	\$64.06
27	D 4			1	2														\$74.74	\$89.69
28	D 5				2			1											\$97.17	\$116.60
29	D 6			1	2			1											\$118.52	\$142.23
30	D 7			2	2														\$96.09	\$115.31
31	D 8			2	2			2											\$183.66	\$220.40
32																				
33	Site Work																			
34	SW 1			1															\$21.35	\$25.62
35	SW 2			2															\$42.71	\$51.25
36	SW 3			1	1														\$48.05	\$57.66
37	SW 4			2	1														\$69.40	\$83.28
38	SW 5			0	1			1			1								\$114.26	\$137.12

[REDACTED]

Labor Rates - S-CA 2005

	Code	Unit	Rate	Description												Asst.	Project	Project	Supt.	Average	
				Laborer			Carpenter			Conc. Fin.			Roofer			Project					
				App	Jou	For.	App	Jou	For.	App	Jou	For.	App	Jou	For.	Manager	Manager				
39	SW 6			0	2			2			2									\$228.53	\$274.23
40	SW 7						1	1												\$70.48	\$84.57
41	SW 8						1	2												\$114.26	\$137.12
42	SW 9						2	2												\$140.96	\$169.15
43	SW 10				1			1												\$70.48	\$84.57
44	Concrete																				
45	C 1										1									\$43.79	\$52.54
46	C 2									1	1									\$70.48	\$84.57
47	C 3									1	2	1								\$165.35	\$198.41
48	C 4							1			3									\$175.14	\$210.17
49	C 5				1			2			3									\$245.62	\$294.74
50	C 6			1	1		1	1		1	3									\$276.57	\$331.89
51	C 7			1	1		1	2		1	2	1								\$327.65	\$393.18
52	Rough Carpentry																				
53	RC 1						1													\$26.69	\$32.03
54	RC 2							1												\$43.79	\$52.54
55	RC 3								1											\$58.38	\$70.06
56	RC 4						1	2												\$114.26	\$137.12
57	RC 5						2	2												\$140.96	\$169.15
58	RC 6						3	3	1											\$269.81	\$323.78
59	RC 7				1		2	2												\$167.65	\$201.18
60	RC 8				2		2	2	1											\$252.72	\$303.26
61	Finish Carpentry																				
62	FC 1						1													\$26.69	\$32.03
63	FC 2							1												\$43.79	\$52.54
64	FC 3								1											\$58.38	\$70.06
65	FC 4						1	2												\$114.26	\$137.12
66	FC 5						2	2												\$140.96	\$169.15
67	FC 6						2	2	1											\$199.34	\$239.20
68	Roofing																				
69	RF 1												1							\$51.74	\$62.09
70	RF 2													1						\$79.99	\$95.99
71	RF 3														1					\$95.99	\$115.18
72	RF 4												1	2						\$211.72	\$254.06
73	RF 5												2	2						\$263.46	\$316.15
74	RF 6												2	2	1					\$359.45	\$431.33

Quantity Take Off

Line	CSI	Description	Notes / Ref.	Dimensions		H	Total	Units
				L	W			
1	07 25 00	Waterproofing - Decks		20	18		360	sf
2								
3	07 30 00	Roofing		65	50		3250	
4				5	15		75	
5							3325	sf
6								
7	07 46 00	Siding	Roof Access	18		8	144	
8				18		8	144	
9				10		8	80	
10							0	
11			FP	8		3	24	
12			FP	8		3	24	
13							0	
14			Pop up	12		3	36	
15				12		3	36	
16				8		3	24	
17				8		3	24	
18							536	sf
19								
20	07 61 00	Flashing and Sheet Metal						
21			A. CAP					
22			roof edge - main				75	
23							75	
24							60	
25							60	
26								
27			roof edge - lower				5	
28							5	
29							15	
30								
31			fence curb				20	
32							20	
33							335	
34								
35			B. DRIP EDGE					
36			Roof access				18	
37							18	
38							10	
39								
40			pop up - stucco				12	
41							12	
42							8	
43							8	
44								
45			pop up - siding				12	
46							12	
47							8	
48							8	
49							126	lf
50								

Quantity Take Off

Line	CSI	Description	Notes / Ref.	Dimensions			Total	Units
				L	W	H		
51		C. L-Metal						
52		Roof access					18	
53							18	
54							10	
55								
56		pop up - stucco					12	
57							12	
58							8	
59							8	
60								
61		pop up - siding					12	
62							12	
63							8	
64							8	
65							126	lf
66								
67		D. Counter Flashing						
68		Roof access					18	
69							18	
70							10	
71								
72		pop up - stucco					12	
73							12	
74							8	
75							8	
76								
77		pop up - siding					12	
78							12	
79							8	
80							8	
81							126	lf
82								
83		E. Pitch Pockets for Fence					15	
84							15	
85							30	ea
86								
87		F. F.P. Cap					2	ea
88								
89								
90		G. Sill Pan at doors					4	ea
91								
92		H. Miscellaneous Allowance					200	lf

Quantity Take Off

Line	CSI	Description	Notes / Ref.	L	Dimensions W	H	Total	Units
93								
94								
95	08 10 00	Doors and Frames						
96			Roof Access Doors				4	doors
97			2'6"x7=17.5 x2 sides =35sf					
98			35sf x 4=140sf				140	sf
99								
100			Frames				15.5	
101							15.5	
102							15.5	
103							15.5	
104							62	
105								
106	08 50 00	Windows	Skylights remove and reset				???	
107								
108	09 24 23	Stucco						
109			pop up	12		3	36	
110				12		3	36	
111				8		3	24	
112				8		3	24	
113							120	sf
114								
115	09 90 00	Painting and Coating						
116			pop up - stucco	12		3	36	
117				12		3	36	
118				8		3	24	
119				8		3	24	
120			elevator shaft to ground	12		32	384	
121				8		32	256	
122								
123			Roof Access - siding	18		8	144	
124				18		8	144	
125				10		8	80	
126							0	
127			FP - siding	8		3	24	
128			FP - siding	8		3	24	
129							0	
130			Pop up - siding	12		3	36	
131				12		3	36	
132				8		3	24	
133				8		3	24	
134							1296	sf
135	32 31 00	Fences and Gates						
136							18	
137							20	
138							18	
139							20	
140							76	lf

Calls, Sub-Bids, Materials

	1
Date:	
Time:	
Sub-Contractor:	See Attached Sweets and Means References
Material Supplier:	
Contact:	
Street Address:	
Phone #:	
Fax #:	
e-mail	
Bidding Sections:	
Bidding Section #'s:	
Bid Amount:	
With Tax and Delivery:	
With Waste:	
Per Unit (SF, LF, CY, Etc.)	
Inclusions:	



Case Study: Construction Cost Estimate for Water Damage in Condo

Eric Wallace · November 8, 2016



The Problem

This project concerned water-related damages to a unit in a low-rise condominium building in Encino, CA. One morning, a second-floor resident, the Plaintiff, heard noises from upstairs that sounded like someone was working on the plumbing system. That evening, the downstairs neighbor, informed the Plaintiff that water was coming through the ceiling and dripping down the chandelier in the lower unit. The Plaintiff then noticed water gushing from her own sink and spreading into the kitchen, dining and living rooms. The resident on the third floor (Defendant) in the apartment directly above the Plaintiff's had hired a plumber to clear a clog in the pipes. The plumber used a device that forced highly pressurized water through the pipe which, in turn, caused the Plaintiff's pipe to burst. After the incident, the Plaintiff hired an "Expert" who estimated the cost of repair for the damages at over \$170,000.

Need Help?

START CHAT

The Solution

PFCS was hired by the Defendant to conduct a site inspection at the Plaintiff's apartment and deliver our own cost-of-repair estimate for the damages observed. During our inspection, we learned that the Plaintiff's Expert had considerably overestimated the cost of certain items, including cabinets, flooring and content storage. We delivered an inspection summary of the damages caused by the water event and a corresponding estimate totaling around \$45,000. The case went to trial and due to our Expert witness testimony, the Plaintiff was only awarded about \$46,000 for construction-related damages and another \$14,000 for non-construction-related issues. The Plaintiff was awarded a total of \$60,000; Over \$100,000 less than what was originally proposed. The jury found that our estimate reflected what the Plaintiff had already been paid and would be a sufficient amount to address the damages.



START CHAT

6. PRESENTING

6. PRESENTING

Case Study – The Problem



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6. PRESENTING

Case Study – The Solution

PFCS collected, organized and analyzed a tremendous volume of project information, including course of construction documents, deposition and trial testimony, and opposing expert witness analysis. We concluded that the claim was without merit, and all of the claims were either not supported, could have been legitimately changed conditions but not for the plaintiff's own contracting negligence, or just plain kooky! Our client was a bit worried when the plaintiff's expert did an excellent job of packaging the claim professionally and, with a straight face, testified compellingly to the judge that the legitimate damages exceeded \$500,000. But due to the testimony of PFCS, the court found:

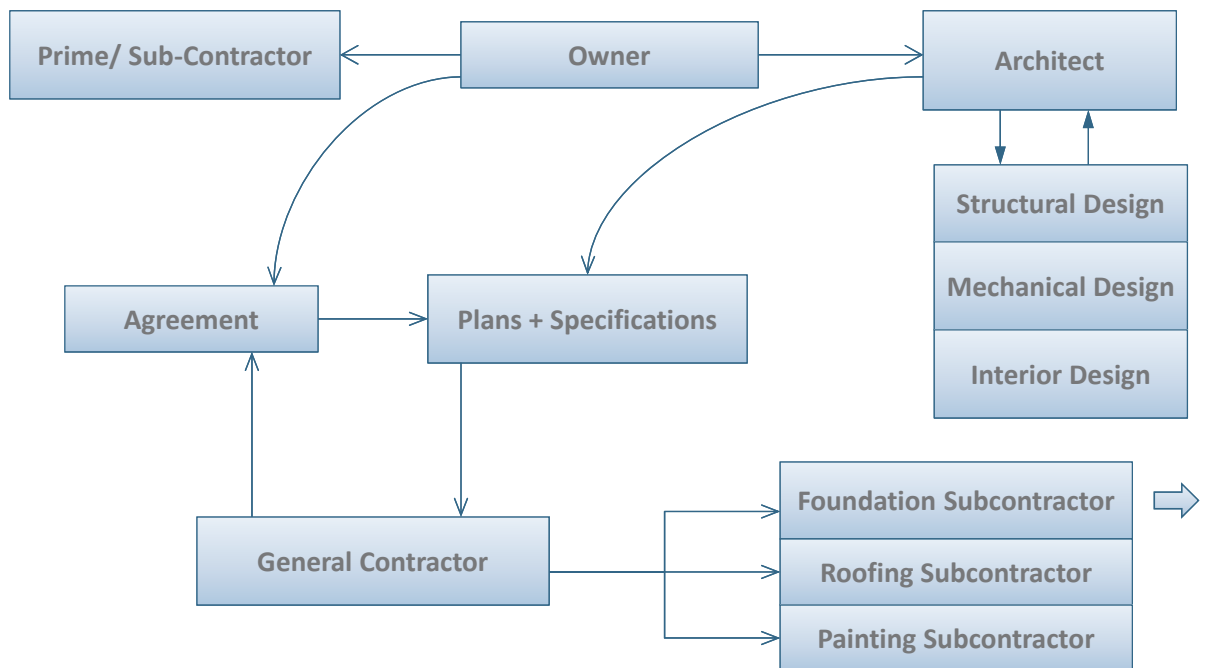
1. The claim was made late.
2. The contract should have been followed for change orders.
3. Plaintiff's claims were not proven.
4. Some of the claims were already the subject of approved change orders.
5. Although "exceptionally well qualified in project management, the analysis of job performance and cost estimating", the plaintiff's expert witness did not make her case on numerous grounds (including those also articulated by PFCS during testimony). The court found that the burden of proof was upon the plaintiff and they failed to do so.



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6. PRESENTING

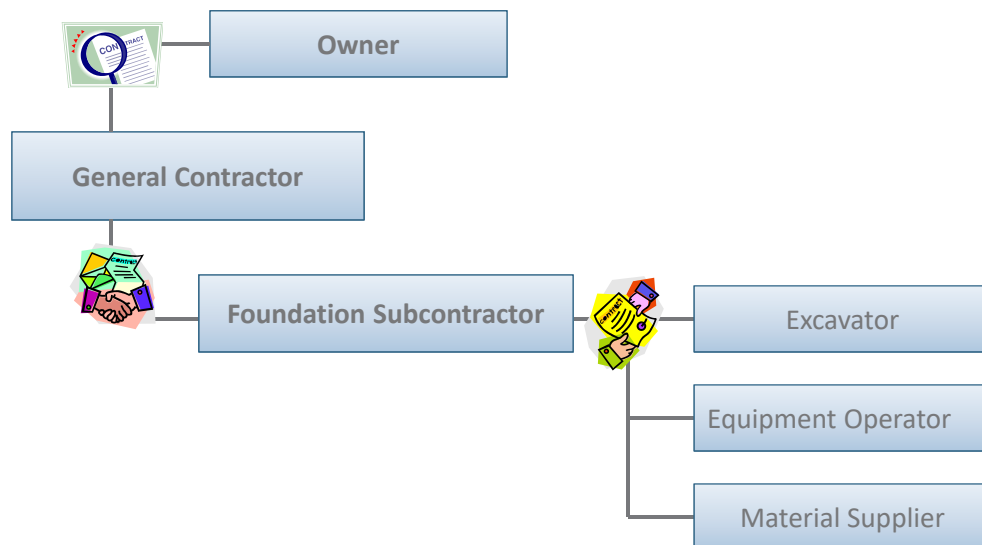
Contracting 101



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6. PRESENTING

Contracting 101



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Case Study

Construction Claim

PFCS Saves Contractor \$500,000 in Damages Claims

The Problem

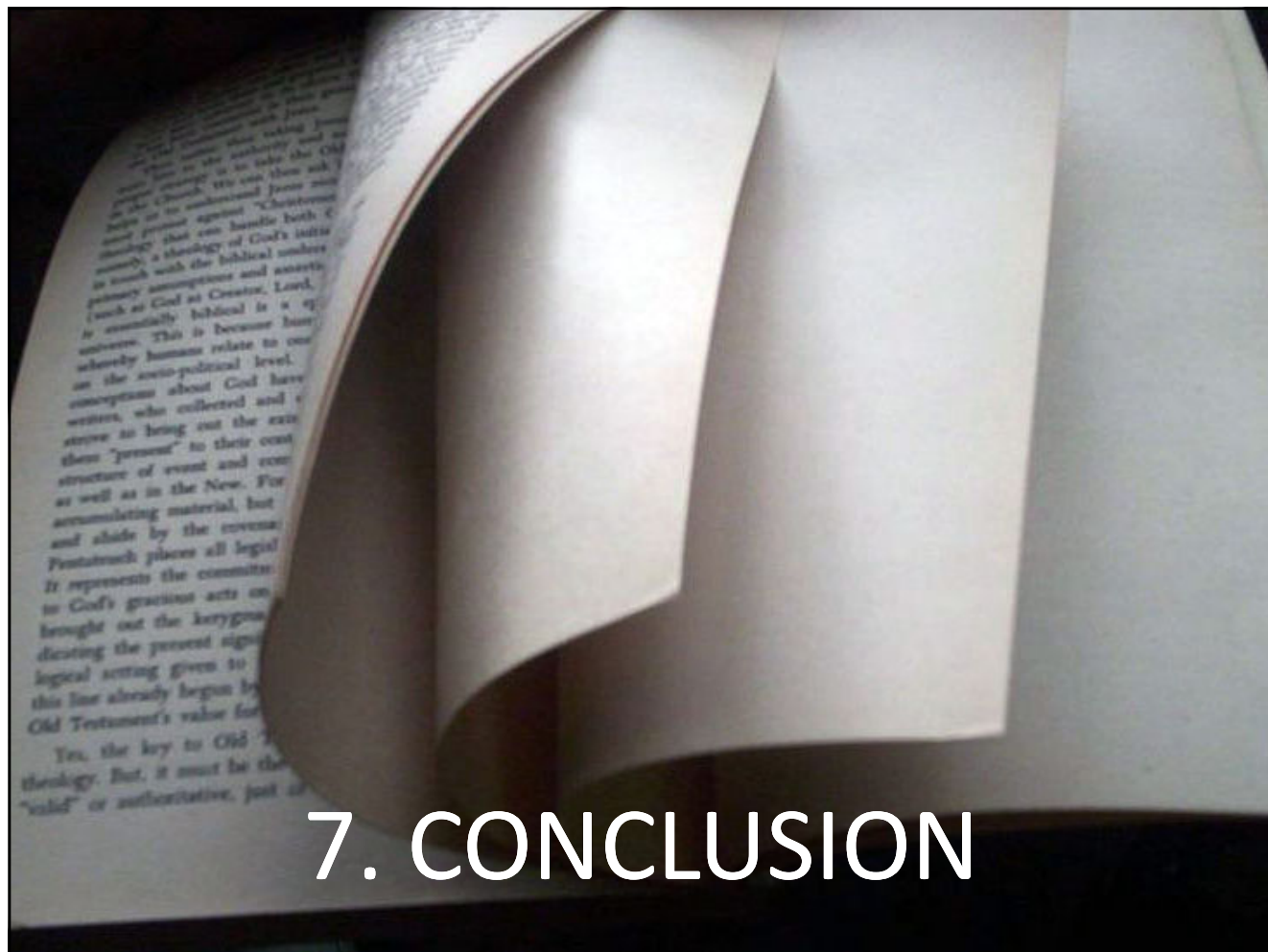
This project concerned a Southern CA theme park ride based on a big-budget action movie. The Owner employed an Owner-Builder project delivery method and contracted directly with a construction manager, Architect/Engineer, and 25 or so trade contractors. Our Client (the Defendant) was a steel fabricator who entered into an agreement as one of the trade contractors in 2010 to provide all labor and materials to furnish and install the Miscellaneous Metals (including cat walks, guardrails, etc...) for \$1.8 million. Our Client subcontracted with the Plaintiff, a steel rigging & erection contractor, for almost \$800,000 to perform all of the installation, per the subcontract between our Client and the Owner-Builder. Approved change orders to the Plaintiff totaled almost \$800,000 which brought the subcontract total to \$1.5 million. At the conclusion of the project, after our Client had released the Owner of any further claims, the Plaintiff submitted a claim letter to our Client, demanding more than \$500,000 in damages.

The Solution

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7. CONCLUSION

7. CONCLUSION

Conclusion

- Learning Objectives
- Program Outline
- Back-Up Materials
- Seminar Materials
- Q & A



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7. CONCLUSION

Learning Objectives

- Introduction of Building Basics as they relate to leaks
- Explain what a professional inspection includes
- Discuss the merits and standards for building leakage testing
- Explain how leaks in construction defect litigation get monetized
- Discuss common presentation formats and strategies



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7. CONCLUSION

Program Outline

1. Introduction
2. Building Basics
3. Inspection
4. Testing
5. Monetizing
6. Presenting
7. Conclusion



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7. CONCLUSION

Back-Up Materials

1. Case Study: Leaky Condo - Construction Defects from the Plaintiff Perspective
2. Case Study: Builder's "Right to Repair" and Elevator Claims Solved Before Litigation
3. Case Study: Construction Cost Estimate for Water Damage in Condo
4. Case Study: PFCS Saves Contractor \$500,000 in Damage Claims



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7. CONCLUSION

Seminar Materials

[PFCS Client Access](#) [Projects](#) [Publications](#) [Seminars](#) [Users](#)

PFCS Webinar 1/30/2014: Building Life Cycle Management

Seminar Information

Event Date	01/30/2014
Event Time	10:00am
Location	Online via GoToWebinar

Video

There is no video version of this presentation available.

Attachments / Backup Materials

File
 Backup Materials

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Join us for our next WEBINAR:
Building Lifecycle Management
Thursday, Dec. 13, 2018



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7. CONCLUSION

Q & A



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End

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