

# We know buildings

EXPERTISE

PROJECT MANAGEMENT

TECHNOLOGY

STANDARDS

RESULTS

[www.petefowler.com](http://www.petefowler.com)



Pete Fowler  
**CONSTRUCTION**  
Services, Inc.

# Budgeting & Estimating for Construction Claims & Construction Defect Litigation



Pete Fowler  
**CONSTRUCTION**  
Services, Inc.

May 12<sup>th</sup>, 2015

[www.petefowler.com](http://www.petefowler.com)

CA 949.240.9971 OR 503.660.8670

# PFCS: Who We Are

## SOLUTIONS

Pete Fowler Construction Services (PFCS) specializes in creating **REAL PRACTICAL SOLUTIONS** for property owners & managers, builders & developers, construction contractors, product manufacturers & suppliers, lawyers and insurers.



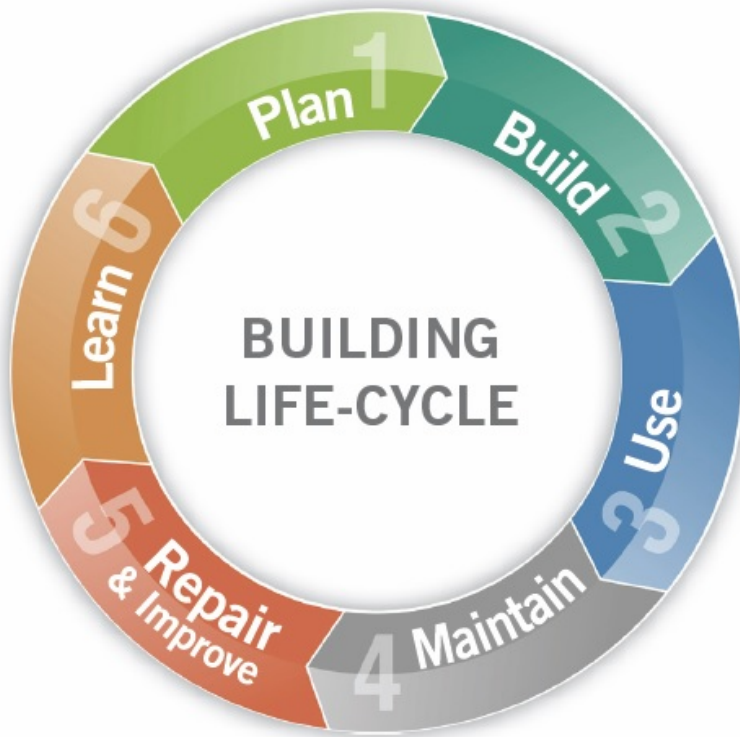
1. INTRODUCTION

# PFCS: We Know Buildings





# PFCS: We Know Buildings



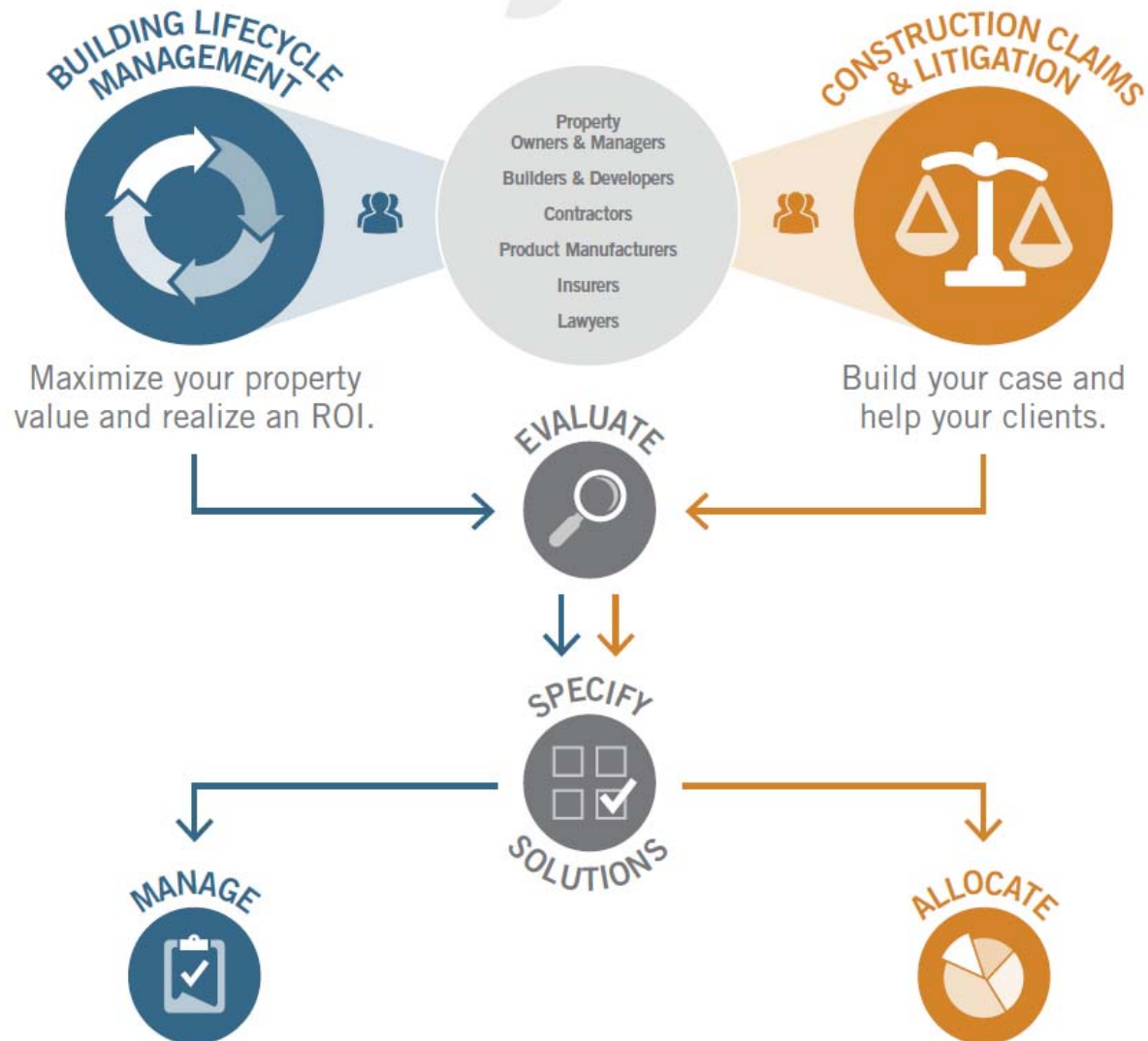
## CLIENTS

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



## 1. INTRODUCTION

# The PFCS Way



# The PFCS Way

## ON ALL PROJECTS

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

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

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

## BLM OR LITIGATION?

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

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



# Program Outline

1. Introduction
2. Order of Magnitude (PFCS Level 1)
3. Putting It All Together
4. Conceptual & Preliminary (PFCS Levels 2-3)
5. Detailed & Bid/Construction/Trial (PFCS Levels 4-5)
6. Estimate Analysis
7. Conclusion





# 1. INTRODUCTION



# Introduction

- Presenter Information
- Webinar Materials
- CE Certificates
- Feedback
- Learning Objectives
- Estimating Basics





# Pete Fowler

## CONNECT WITH PETE

Call 949.240.9971

Email [pf@petefowler.com](mailto:pf@petefowler.com)

Find him on [LinkedIn!](#)



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

## 1. INTRODUCTION

# Webinar Materials

PFCS Client Access Projects Publications **Seminars** Users

### Seminars

Seminar
<a href="#">PFCS Webinar 1/30/2014: Building Life Cycle Management: Why You Should Care</a>
<a href="#">PFCS Webinar 12/18/2013: Allocation of Responsibility for Construction Defects</a>
<a href="#">PFCS Webinar 11/21/2013: Random Selection and Extrapolation of Construction Defects</a>
<a href="#">PFCS Webinar 11/7/2013: Builders Right To Repair Bills: California's S</a>
<a href="#">PFCS Webinar 10/17/2013: Construction Contracts, Risks &amp; Insurance</a>

Click on the seminar you attended

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



# CE CERTIFICATES WILL BE SENT OUT WITHIN 3 BUSINESS DAYS

*(There is no need to contact us, Certificates of Attendance are sent to all who logged in for the seminar).*





# Your Feedback is Important

## SURVEY SAYS!



You will receive a survey link immediately following the webinar. We put a lot of effort into providing these programs free of charge, we just ask that you take a few seconds to leave your feedback on today's presentation



# Learning Objectives

- Understand the Fundamentals of Estimating
- Orientation To Estimate Components
- PFCS 5 Levels – 10 Steps of Estimating
- Introduction to Analysis of Estimates & Construction Costs



# Estimating Basics

## IDENTIFY OR ESTIMATE ALL COSTS

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.



# Estimating Basics

## ESTIMATING

- Real Costs to Perform
- Labor Costs
- Material Costs
- Equipment Costs
- Detailed Quantity Takeoff
- Access to Site

## PRICING

- Competition
- Market Conditions
- Contractor Availability
- Personal Relationships
- Payment Dependability



# Estimating Basics

## PURPOSE FOR ESTIMATING

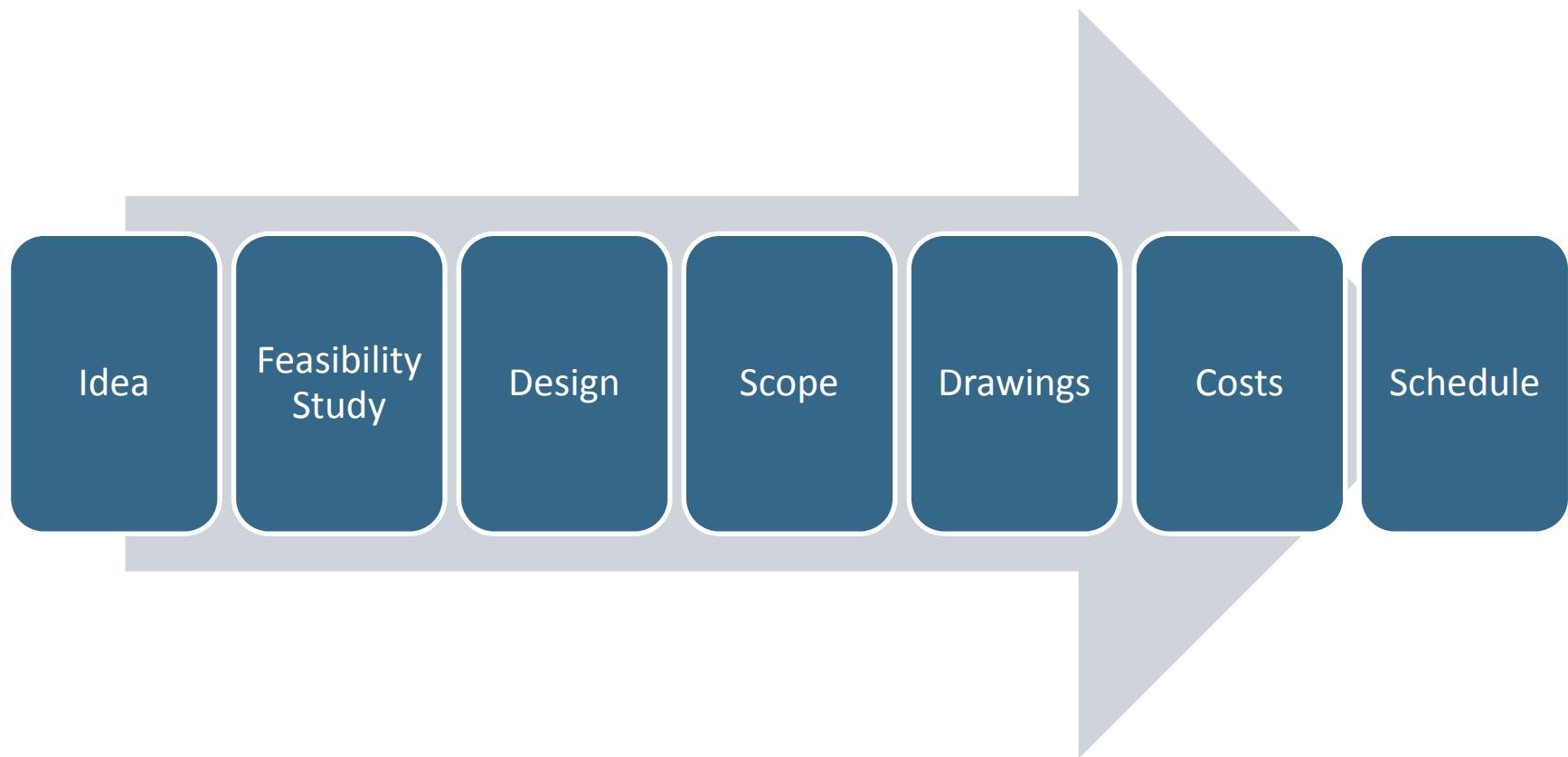
- Budget / Feasibility
- Project Control / Project Management
- Bid
- Proposal
- Insurance Claim
- Litigation





# Estimating Basics

BUILD THE PROJECT ON PAPER BEFORE THE REAL WORLD



# Estimating Basics

## SCOPE, METHOD & COSTS

	New Construction	Remodeling, Maintenance, Repairs	Construction Defect
Scope	Owner & Architect	Owner & General Contractor	Trade Experts & Lead Expert
Method	Architect, Engineer & General Contractor	General Contractor	Plaintiff Experts & Cost Estimator
Cost	General Contractor	General Contractor	Cost Estimator



# Estimating Basics

## TOOLS OF THE TRADE

- Pencils and paper
- Colored pens or pencils for quantity take off
- Architectural and Engineering Scales (rulers)
- Labor / Crew Rates
- Historical Cost Data?
- Forms
- Checklists (CSI, Bid Documents, Site Investigation, Direct Cost, OH, Review)
- Calculator OR Computer?
  - Estimating Software?
  - Spreadsheet Software?
- Guide Books?



# Estimating Basics

## ESTIMATING SKILLS

- Plan Reading
- Understanding Construction
- Construction Math
- Computer Spreadsheets



# Estimating Basics

## 5 LEVELS

1. Order of Magnitude
2. Conceptual
3. Preliminary
4. Detailed
5. Bid/Construction/Trial

## 10 STEPS

1. Format
2. Scope
3. Time/Labor
4. Material
5. Equipment
6. Subs
7. General Conditions
8. Overhead
9. Profit
10. Non-Construction





# Estimating Basics

10 STEPS

5 LEVELS

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Level 5 Estimating  
5 Levels - 10 Steps

3/10/2009

STEP 1	Level 1 Order of Magnitude	Level 2 Conceptual	Level 3 Preliminary	Level 4 Detailed	Level 5 Bid / Construction / Trial
STEP 2	Summary Sheet Only	Add capital letters (or	Conform with the WBS	See PFCS Samples for	Final Pass for clarity and
STEP 3	Level 1	Level 2	Level 3	Level 4	Level 5
STEP 4					
STEP 5					
STEP 6					
STEP 7					
STEP 8					
STEP 9					
STEP 10					
	WAG	SWAG	More Support	More Support	Calls Bids
	1-4 Hours	2-24 Hours	16-100 Hours	50-200 Hours	100+ Hours



## 2. ORDER OF MAGNITUDE (PFCS LEVEL 1)

# Order of Magnitude (PFCS Level 1)

- Case Study: Otto's Outhouse
- Level 1: 10 Steps
- Case Study: Multi-Family Residential
- Case Study: Commercial
- Your Room Using Unifomat



2. ORDER OF MAGNITUDE

# Case Study

*PFCS' Simplified Case Study:  
Otto's Outhouse*



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

## 2. ORDER OF MAGNITUDE

# Level 1: 10 Steps

www.petefowler.com		Level 5 Estimating 5 Levels - 10 Steps			3/10/2009
<b>STEP 1</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>
<b>STEP 2</b>	Order of Magnitude	Conceptual	Preliminary	Detailed	Bid / Construction / Trial
<b>STEP 3</b>	Level 1	Summary Sheet Only	Add capital letters (or numbers if L1 are letters) with 2 to 15 items under each of the main categories	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.
<b>STEP 4</b>			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.
<b>STEP 5</b>			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
<b>STEP 6</b>			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
<b>STEP 7</b>			Rough Estimate. No Calls	Calls, Books	Calls, Books, Bids
<b>STEP 8</b>			Books, NO calls	Some Calls	Lots of Calls, Maybe send info, Maybe Bids
<b>STEP 9</b>			Reconsider % or Amount	Reconsider % or Amount	Broken Down
<b>STEP 9</b>			Reconsider % or Amount	Reconsider % or Amount	Possibly Broken Down
<b>STEP 9</b>			Reconsider % or Amount	Reconsider % or Amount	Reconsider % or Amount
<b>STEP 10</b>			WAG	More Support	More Support
			1-4 Hours	2-24 Hours	16-100 Hours
				50-200 Hours	100+ Hours





# Case Study: 10 Steps: Level 1

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



# Case Study: Order of Magnitude

1	Grading & Excavation	\$1,000.00
2	Framing	\$1,000.00
3	Roofing	\$500.00
4	Final Clean-Up	\$500.00
5	<b>SUB TOTAL</b>	<b>\$3,000.00</b>
6	Profit & Overhead	\$1,000.00
7	<b>Total Construction Costs</b>	<b>\$4,000.00</b>
8	Other Project Costs	\$500.00
9	<b>TOTAL</b>	<b>\$4,500.00</b>



# Case Study: Multi-Family Residential



## 2. ORDER OF MAGNITUDE

# Case Study: Multi-Family Residential

Photo	Location	Code	Description	
	Ext - West			
	Bldg 1	Unit	X	Total
	2	19,880	2	39,760
	3	23,800	12	285,600
	4	32,200	3	96,600
		42,000	3	126,000
	total			547,960
	47 units	1,000 - 3,000		= 141,000
		max		688,960
		20%		137,792
	cost			
	range	900,000		- 826,752

Pete Fowler  
CONSTRUCTION  
Services, Inc.

Job Name \_\_\_\_\_ Job # 06.295  
Date \_\_\_\_\_ By \_\_\_\_\_ Page 3





2. ORDER OF MAGNITUDE

# Case Study: Commercial



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

## 2. ORDER OF MAGNITUDE

# Case Study: Commercial

## Order of Magnitude

### Pete Fowler CONSTRUCTION Services, Inc.

### Order of Magnitude

Date:	January 31, 2008
To:	FILE
From:	Pete Fowler Construction Services, Inc.
Project:	Thompson Gardens PFCS Project #07-331 Address: 45 SW 32 <sup>nd</sup> Ave., Somewhere, OR
Regarding:	Order of Magnitude Estimate
Note:	Confidential Attorney-Client and Attorney Work Product. Protected under all applicable evidence codes.

PFCS has reviewed our inspection documentation of the exterior and interior of the building and also the results of the window testing that was performed on January 21 and 22, 2008. Our conclusions regarding the necessary repairs are as follows:

1. Replace the siding on the front (south) elevation only with a rain screen siding system (approximately 6800sf)
2. Replace the gypsum wall board (GWB) and oriented strand board sheathing as necessary at the front elevation (approximately 3000sf)
3. Replace all windows on the south elevation only (53 total)
4. Replace the Ply-Trim on the entire building with cedar or redwood dimensional lumber (approximately 6000lf)
5. Paint entire building (approximately 15,000sf)

### Costs

#	Description	#	Units	\$/Unit	Total
1	Siding Replacement (South Side Only)	6,800	SF	20.00	136,000
2	GWB & OSB Replacement	3,000	SF	16.66	50,000
3	Windows	53	EA	250.00	13,250
4	Trim replacement (peel & stick, sealant joints)	6,000	LF	10.00	60,000
5	Paint	15,000	SF	2.00	30,000
6	Subtotal				289,250
7	P & O	40%			115,700
8	Total				\$ 404,950

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9320 SW Barbur Blvd., Suite 170, Portland, OR 97219 T: 503.246.3744 F: 949.240.9972



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

## 2. ORDER OF MAGNITUDE

# Your Room Using Unifformat

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements
A SUBSTRUCTURE	A10 Foundations	A1010 Standard Foundations A1020 Special Foundations A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation A2020 Basement Walls
B SHELL	B10 Super Structure	B1010 Floor Construction B1020 Roof Construction
	B20 Exterior Enclosure	B2010 Exterior Walls B2020 Exterior Windows B2030 Exterior Doors
	B30 Roofing	B3010 Roof Coverings B3020 Roof Openings
C INTERIORS	C10 Interior Construction	C1010 Partitions C1020 Interior Doors C1030 Fittings
	C20 Stairs	C2010 Stair Construction C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes C3020 Floor Finishes C3030 Ceiling Finishes



## 2. ORDER OF MAGNITUDE

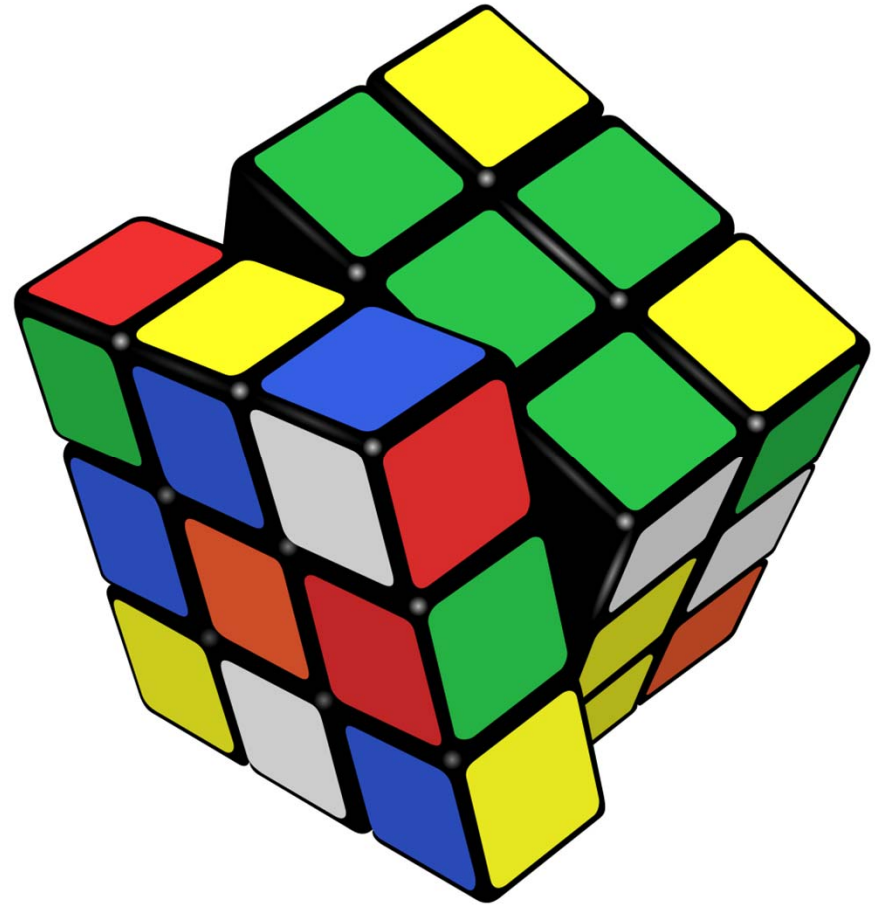
# Your Room Using Uniformat

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements
D SERVICES	D10 Conveying	D1010 Elevators & Lifts D1020 Escalators & Moving Walks
	D20 Plumbing	D2010 Plumbing Fixtures D2020 Domestic Water Distribution D2030 Sanitary Waste D2040 Rain Water Drainage
	D30 HVAC	D3010 Energy Supply D3020 Heat Generating Systems D3030 Cooling Generating Systems D3040 Distribution Systems D3090 Other HVAC Systems & Equipment
	D40 Fire Protection	D4010 Sprinklers D4020 Standpipes D4030 Fire Protection Specialties
	D50 Electrical	D5010 Electrical Service & Distribution D5020 Lighting & Bench Wiring D5030 Communications & Security
E EQUIPMENT & FURNISHINGS	E10 Equipment	E1010 Commercial Equipment E1020 Institutional Equipment
	E20 Furnishings	E2010 Fixed Furnishings E2020 Movable Furnishings
F SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction	F1010 Special Structures F1020 Integrated Construction
	F20 Selective Building Demolition	F2010 Building Elements Demolitions F2020 Hazardous Components Abatement





3. PUTTING  
IT ALL  
TOGETHER



# Putting It All Together

- 10 Steps Summary
- 5 Levels – 10 Steps
- Decide on the Level of Detail
- A Sensible List
- Estimate Set-Up
- Relating the Parts
- Resources



# 10 Steps Summary

1. Format
2. Scope
3. Time (Labor)
4. Materials
5. Equipment
6. Independent Subcontractors
7. General Conditions (Project Specific OH)
8. Internal (Overhead) Costs
9. Profit
10. Non-Construction (Other) Costs



### 3. PUTTING IT ALL TOGETHER

# 5 Levels – 10 Steps

www.petefowler.com		Level 5 Estimating 5 Levels - 10 Steps				3/10/2009
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



# Decide on the Level of Detail

- Level 1: Order of Magnitude
- Level 2: Conceptual
- Level 3: Preliminary
- Level 4: Detailed
- Level 5: Bid / Construction / Trial



# A Sensible List

- Why This Matters
- By Importance
- Room-by-Room (Location by Location)
- SB 800
- By Who did the Work: CSI Codes
- By Assembly: Unifformat (PFCS Standard)
- Work Breakdown Structure



# A Sensible List

## CONSIDER OUTLINING OR ORGANIZING USING:

- Use the Specifications or Project Manual, if one exists
- Project Activities
- CSI Master Format Codes
- Unifomat
- Residential List of Cost Categories
- Commercial / Industrial List of Cost Categories
- By Issue List or Defect List
- Homeowners List, Address or Unit Number
- DELIVERABLE: **Estimate Summary** sheet complete



# Estimate Setup

1. Outline items that will be on the Estimate Summary. Usually 5-20 items
2. Save estimate template to the file
3. Fill out Cover Page with all applicable information and identify the sheets you know will be included on the Table of Contents
4. Populate the Estimate Summary sheet with the items identified above
5. Apply any known Units on the Summary Sheet
6. Update figures and percentages below Sub-Total on the Summary





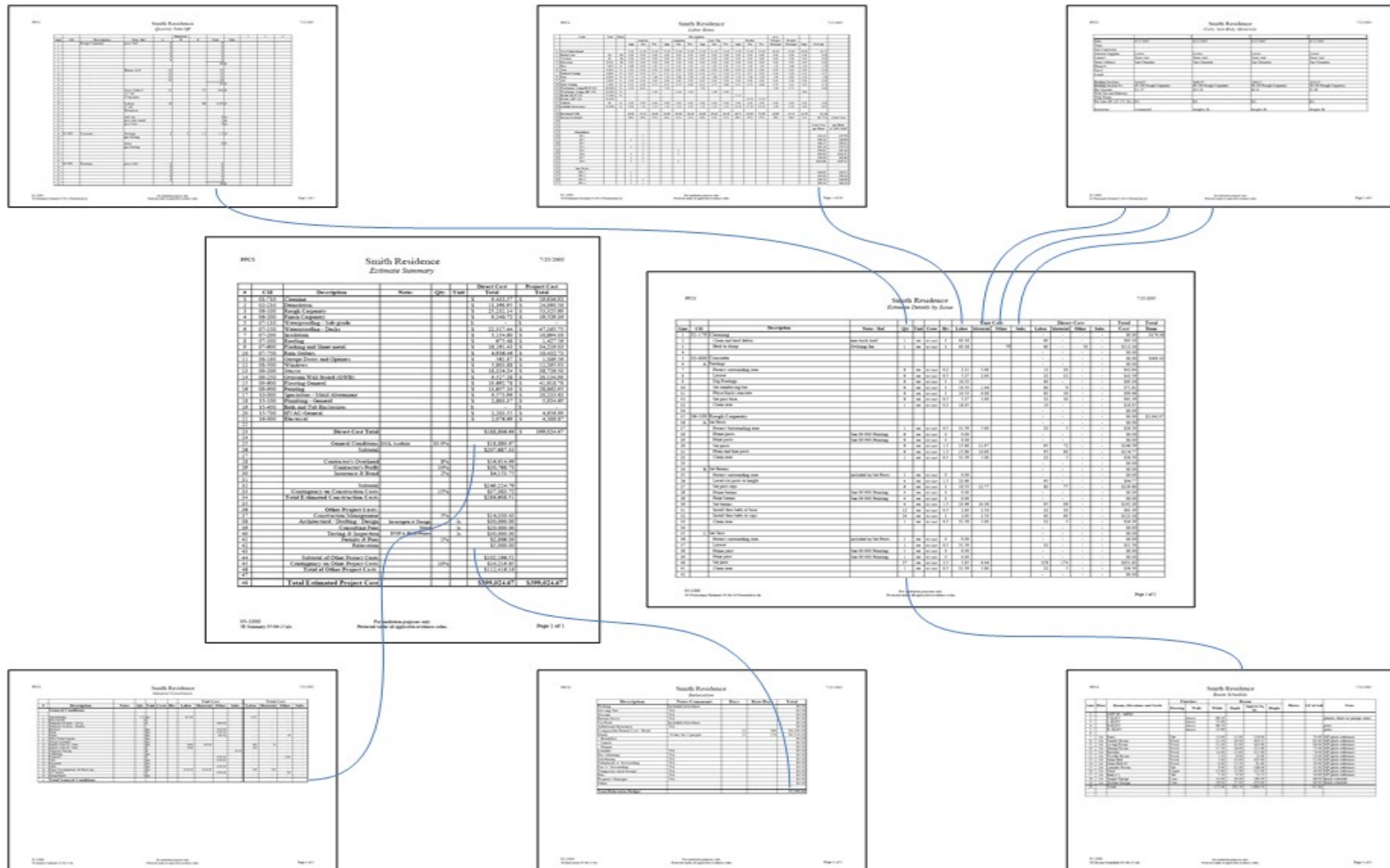
# Estimate Setup

7. Copy the Estimate Summary line items to the Estimate Details sheet
8. Make 5 or more lines between each of the copied line items (categories)
9. Sum the items below each category on the Details page
10. Link line items in Estimate Summary sheet in the Direct Cost Total column to associated items copied to the Estimate Details in the Total column
11. Add sample data to check math on Estimate Details and Summary pages
12. Format the complete estimate for print including all headers and footers



### 3. PUTTING IT ALL TOGETHER

# Relating the Parts



# Relating the Parts

## ESTIMATE COMPONENTS

1. Title Page
2. Summary
3. Estimate Details
4. Unit Matrix / Room Schedule
5. Quantity Take Off Documentation
6. Labor and Crew Rates
7. Material Prices and Equipment Costs
8. Subcontractors Calls and Costs
9. General Conditions
10. Other Project Costs, including design, engineering, project management
11. Relocation



# Resources

- Standard Estimating Practice Ninth Edition; American Society of Professional Estimators
- Walker's Building Estimator's Reference Book Twenty Ninth Edition; Frank R. Walker Company
- RS Means Mechanical Cost Data 2014; The Gordian Group Inc.
- RS Means Building Construction Cost Data 2014; The Gordian Group Inc.



# Estimate Backup

- Any assumption that is not in the estimate should be in the backup.
- Organize it the same as the Estimate Summary.
- Include applicable codes, plans, specifications, addenda, contracts, RFIs, change orders, other project docs, inspection docs, testing, repairs, calculations, photos, markups, research, book page copies, internet research, etc.
- It does not need to be beautiful, it just needs to be complete.
- Generally create a packaged file (PDF), either one file with 100% of the backup, or a file for each estimate section.
- The electronic file should be complete, ensuring you have access to all of the backup documentation while reviewing and/or updating the estimate.



# 4. CONCEPTUAL & PRELIMINARY (PFCS LEVELS 2-3)

# Conceptual & Preliminary

- Level 2 & Level 3: 10 Steps
- Construction Costs Flow Chart
- Using the Estimate Components
- Estimate Details
- Quantity Take Off (QTO)
- Case Study: Otto's Outhouse



#### 4. CONCEPTUAL & PRELIMINARY

# Level 2 & Level 3: 10 Steps

www.petefowler.com

Level 5 Estimating  
5 Levels - 10 Steps

3/10/2009

Line	Level 1 Order of Magnitude	Level 2 Conceptual	Level 3 Preliminary	Level 4 Detailed	Level 5 Bid / Construction / Trial
1	Summary Sheet Only	Add capital letters (or run with each	Conform with the WBS	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	Level 1 Work Breakdown Structure (WBS): 1 paragraph to 1 page. There only basic quantities (no QTO) in approximate figures	Add capital letters (or run with each	Conform with the WBS	Complete, detailed QTO.	Final Pass. Check QTO on key items.
3	Little or no breakdown of cost / time in this step	Reconsider % or Amount	Reconsider % or Amount	Use Walker's Labor Rates	Final Pass
4	Guesstimate. Little QTO, quantities only - not cost of materials. Assembly level estimates at the most	Reconsider % or Amount	Reconsider % or Amount	Calls, Bids, Alternatives refined	Final Pass
5	WAG. Often none	Reconsider % or Amount	Reconsider % or Amount	Calls, Books, Bids	Final Pass
6	Unit prices, WAG, Use books only on BIG #s	Reconsider % or Amount	Reconsider % or Amount	Lots of Calls, Maybe send info, Maybe Bids	Final Pass
7	of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Broken Down	Same as L4
8	of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Possibly Broken Down	Same as L4
9	of Direct Cost	Reconsider % or Amount	Reconsider % or Amount	Reconsider % or Amount	Reconsider % or Amount
10	WAG	SWAG	More Support	More Support	Calls Bids
11	Hours	2-24 Hours	16-100 Hours	50-200 Hours	100+ Hours





## Level 2: 10 Steps

1. **Format:** Add capital letters (or numbers if L1 are letters) with 2 to 15 items under each of the main categories
2. **Scope:** 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)
3. **Time (Labor):** Rough Estimate, Typical crews, Round numbers, slightly over estimating. No calls
4. **Materials:** QTO, Rough Estimate, Slightly over estimating. Books only for big no.'s, NO calls unless faster than book. Make links to the Calls, Subs, Bids sheet, put estimates for the material in the linked cell; when it's is updated, the new amount will automatically update
5. **Equipment:** Rough Estimate. No calls
6. **Independent Subcontractors:** Books, NO calls
7. **General Conditions:** Reconsider % or Amount
8. **Internal (Overhead) Costs:** Reconsider % or Amount
9. **Profit:** Reconsider % or Amount
10. **Non-Construction (Other) Costs:** SWAG



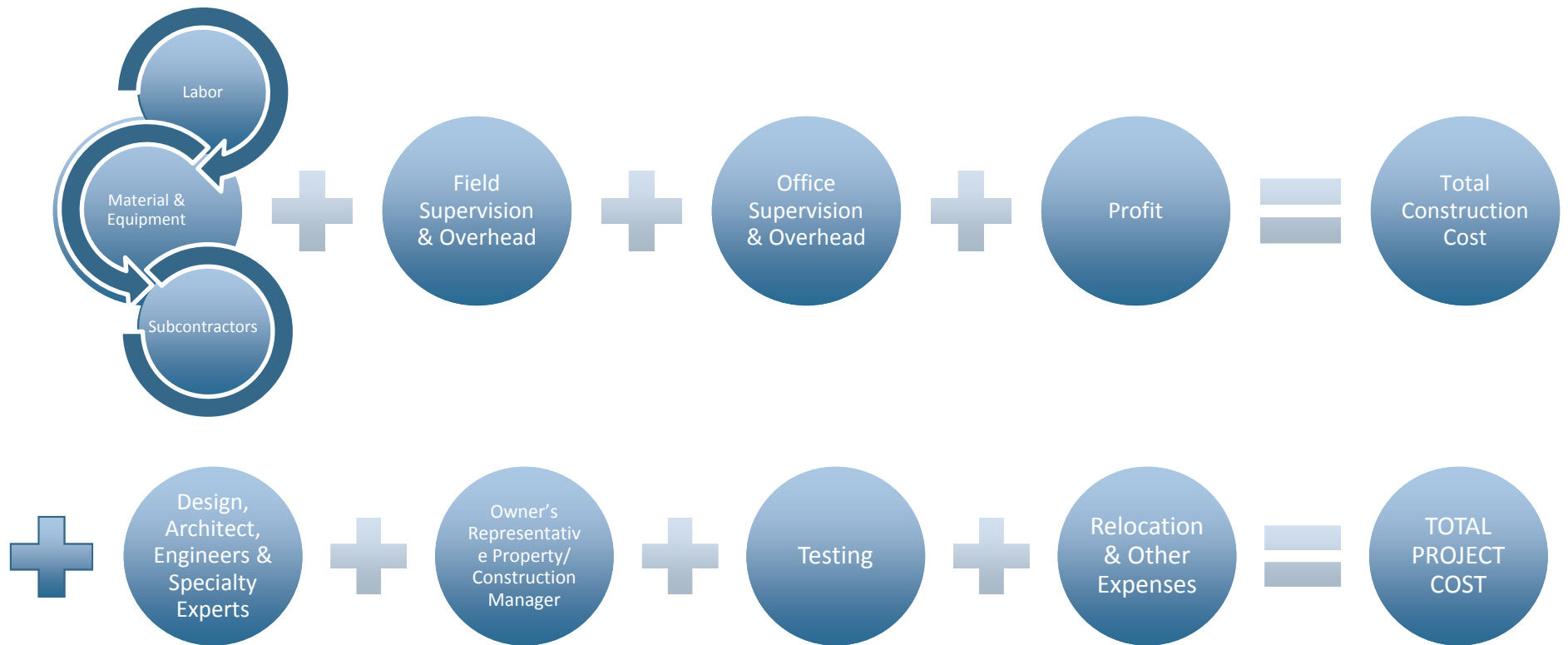
## Level 3: 10 Steps

1. **Format:** Conform with the WBS rules: Main Category, then capital letters or numbers, then alternate with each new level.
2. **Scope:** Level 3 WBS with letters, numbers, and CSI codes. More detailed QTO.
3. **Time (Labor):** Productivity rates, Use Walker's book on big numbers.
4. **Materials:** Calls, Books, Maybe Alternatives
5. **Equipment:** Calls, Books
6. **Independent Subcontractors:** Some Calls
7. **General Conditions:** Reconsider % or Amount
8. **Internal (Overhead) Costs:** Reconsider % or Amount
9. **Profit:** Reconsider % or Amount
10. **Non-Construction (Other) Costs:** More support



# Level 2+ Estimating

## CONSTRUCTION COST FLOW CHART



# Using the Estimate Components

1. Title Page
2. Summary
3. Estimate Details
4. Unit Matrix / Room Schedule
5. Quantity Take Off Documentation
6. Labor and Crew Rates
7. Material Prices and Equipment Costs
8. Subcontractors Calls and Costs
9. General Conditions
10. Other Project Costs, including design, engineering, project management
11. Relocation



# 4. CONCEPTUAL & PRELIMINARY

## Estimate Details

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Smith Residence  
Estimate Details

8/21/2007

		Description	Notes / Ref.	Qty	Unit	Crew	Hrs	Unit Cost				Total Cost				TOTAL	Category
Line	Code							Labor	Material	Other	Sub.	Labor	Material	Other	Sub.		
222	20	Hall Bath and Hall Bath WC										-	-	-	-	\$0.00	6.032
223	16-000	Test out circuits	See General Remarks									-	-	-	-	\$0.00	
224	00-700	Protect surrounding areas	12x5x3	1.0	L5	D2	0.5	22.24	10.73			22	11	-	-	\$32.97	
225	00-100	Replace sub floor		36.0	SF	RC2	5	4.26	1.39			153	50	-	-	\$203.25	
226	07-200	Replace batt insulation - R13		56.0	SF	D2	1	0.79	0.33			44	18	-	-	\$62.79	
227	00-250	Replace GWB, four walls and ceiling	3 move-on	260.0	SF	D2	3	0.51	0.25			133	64	-	-	\$197.71	
228	00-250	Tap & texture to match existing	2 move-on	260.0	L5	D2	6	1.03	0.10			267	27	-	-	\$293.80	
229	00-600	Prime and paint 2 coats		260.0	SF	D2	2	0.34	0.17			89	44	-	-	\$133.31	
230	00-200	Reinstall two doors and new casing both sides		2.0	L5	RC2	1.5	22.99	20.00			46	40	-	-	\$85.97	
231	00-400	Install wallpaper		100.0	SF	RC2	4	1.22	3.00			123	300	-	-	\$422.60	
232	00-200	Replace vanity	M=pre-painted	7.0	LF	RC2	2	8.76	150.00			61	1,050	-	-	\$1,111.30	
233	00-350	Replace countertop - tile		14.0	SF	RC2	4	8.76	7.00			123	98	-	-	\$220.60	
234	00-300	Replace ceramic tile floor		62.0	SF	RC2	5	2.47	7.00			153	434	-	-	\$587.25	
235	00-300	Replace ceramic tile base		45.0	LF	RC2	2	1.36	3.50			61	158	-	-	\$218.80	
236	10-000	Replace mirror - 1-4" plate glass		1.0	L5	RC2	1	30.65	200.00			31	200	-	-	\$230.65	
237	00-200	Replace medicine cabinet		1.0	L5	D2	1	44.49	31.90			44	32	-	-	\$76.39	
238	15-100	Replace toilet		1.0	L5	D2	1	44.49	150.00			44	150	-	-	\$194.49	
239	15-100	Replace toilet seat		1.0	L5	D2	1	44.49	28.00			44	28	-	-	\$72.49	
240	15-100	Replace sinks, two		2.0	L5	RC2	1	15.32	40.00			31	80	-	-	\$110.65	
241	15-100	Replace sink faucets, two		2.0	L5	RC2	1	15.32	60.00			31	120	-	-	\$150.65	
242	00-200	Replace bathtub		1.0	L5	RC2	1	30.65	181.50			31	182	-	-	\$212.15	
243	00-300	Replace tile sub surround		70.0	SF	RC2	24	10.51	7.00			736	490	-	-	\$1,225.59	
244	00-200	Replace bath accessory	M=Allowance	1.0	L5	D2	1	44.49	100.00			44	100	-	-	\$144.49	
245	01-710	Clean up	Dwgs in GC's	1.0	L5	D2	1	44.49				44	-	-	-	\$44.49	
246	21	Master Bed, Offset, Raised Area, Closet, Right Closet and Left Closet										-	-	-	-	\$0.00	10.337
247	16-000	Test out circuits	See General Remarks									-	-	-	-	\$0.00	
248	00-700	Protect surrounding areas	20x11x3	1.0	L5	D2	0.5	22.24	10.73			22	11	-	-	\$32.97	
249	00-250	Tap & texture to match existing	12 move-on	1241.0	L5	D2	32	1.15	0.10			1,424	128	-	-	\$1,551.87	
250	00-600	Prime and size wall before wall paper	M=prime only	743.0	SF	D2	4	0.24	0.10			178	74	-	-	\$252.75	
251	00-200	Install closet shelf, rod and organizer		9.0	EA	D2	20	177.95	250.00			890	1,250	-	-	\$2,139.75	
252	00-400	Install wallpaper		743.0	SF	RC2	24	0.99	4.00			736	2,972	-	-	\$3,707.59	
253	00-200	Reinstall four doors and new casing both sides		4.0	L5	RC2	1.5	11.49	20.00			46	80	-	-	\$125.97	
254	00-600	Repair door and jamb	Mask & Spray	4.0	EA	D2	3	33.37	19.77			133	79	-	-	\$212.53	
255	10-000	Install intercom station	M=Allowance	1.0	L5	RC2	1	30.65	150.00			31	150	-	-	\$180.65	
256	10-000	Install security system - control panel	M=Allowance	1.0	L5	RC2	1	30.65	150.00			31	150	-	-	\$180.65	
257	00-200	Install ornamental iron hand rail	M=fasteners	1.0	L5	RC2	2	61.30	10.00			61	10	-	-	\$71.30	
258	00-600	Paint ornamental iron hand rail, 36" to 42" high	M=1 GAL	1.0	L5	D2	4	177.95	19.77			178	20	-	-	\$197.72	
259	00-600	Replace carpet and pad	M=High Grade	58.0	SF	SLB			25.00			-	1,450	-	145	\$1,595.00	
260	01-710	Clean up	Dwgs in GC's	1.0	L5	D2	2	88.98				89	-	-	-	\$88.98	

03-275  
SECT 04 Preliminary Estimate 04-01-27.xls

For quotation purposes only.  
Priced under all applicable conditions.

Page 9 of 14

03-275  
SECT 06 Preliminary Estimate 04-01-21.xls

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Page 9 of 14



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

# Estimate Details

1. Line
2. Code
3. Description
4. Notes / References
5. Quantity
6. Unit
7. Crew
8. Hours
9. Unit Cost
  - A. Labor
  - B. Material
  - C. Other
  - D. Subcontractors
- 10.Total Cost
  - A. Labor
  - B. Materials
  - C. Other
  - D. Subcontractors
- 11.Line Total
- 12.Category Total



# Quantity Take Off (QTO)

Take off, sometimes spelled as "take-off" or "takeoff," is a part of the cost estimating process in the construction industry. Estimators use construction blueprints, either manually or electronically, and start "taking off" quantities of items they will need from those blueprints in order to prepare part of the estimate. Examples of possible take offs include the number of light fixtures needed in the building plan or the amount of wiring needed for the electrical work.

Take off happens in different ways: Some do manual takeoffs from field sketches, some do on-screen take offs using estimating software programs, and some use digitizers, which are electronic measuring devices that work on hard copy plans.

*Source - <http://whatis.techtarget.com>*



# Quantity Take Off (QTO)

## QUANTITIES COMMONLY INCLUDE:

- SF: Square Feet
- LF: Lineal Feet
- CY: Cubic Yard
- CF: Cubic Feet
- Acre: A unit of land area equal to 4,840 square yards
- SY: Square Yard
- GAL: Gallons
- LBS: Pounds
- Ton: 2,000 pounds
- B.F.M.: Thousand Board Feet





#### 4. CONCEPTUAL & PRELIMINARY

# Case Study

*PFCS' Simplified Case Study:  
Otto's Outhouse*

**Estimate the COST of this  
project!**



# 5. DETAILED & BID/ CONSTRUCTION/TRIAL

(PFCS LEVELS 4-5)

# Detailed Estimate (PFCS Levels 4-5)

- Level 4 & Level 5: 10 Steps
- Detailed Estimating
- Refine the Estimate: Many Passes
- Peer Review
- Case Study: Thompson Gardens
- Case Study: Cuban's Manor



# Level 4 & Level 5: 10 Steps

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Level 5 Estimating  
5 Levels - 10 Steps

3/10/2009

	Level 1 Order of Magnitude	Level 2 Conceptual	Level 3 Preliminary	Level 4 Detailed	Level 5 Bid / Construction / Trial
<b>STEP 1</b>	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 co
<b>STEP 2</b>				<b>Level 4</b>	<b>Level 5</b>
<b>STEP 3</b>	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.		
<b>STEP 4</b>					
<b>STEP 5</b>	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		
<b>STEP 6</b>	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		
<b>STEP 7</b>					
<b>STEP 8</b>	WAG. Often none	Rough Estimate. No Calls	Calls, Books		
<b>STEP 9</b>	Unit prices, WAG, Use books only on BIG #'s	Books, NO calls	Some Calls		
<b>STEP 10</b>	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount		
	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount		
	% of Direct Cost	Reconsider % or Amount	Reconsider % or Amount		
	WAG	SWAG	More Support	More Support	Calls Bids
	1-4 Hours	2-24 Hours	16-100 Hours	50-200 Hours	100+ Hours



## Level 4: 10 Steps

1. **Format:** See PFCS Samples for deeper and deeper levels. Conform to rules of WBS
2. **Scope:** Complete, detailed QTO
3. **Time (Labor):** Use Walker's Labor Rates
4. **Materials:** Calls, Bids, Alternatives refined
5. **Equipment:** Calls, Books, Bids
6. **Independent Subcontractors:** Lots of Calls, Maybe send info, Maybe Bids
7. **General Conditions:** Broken Down
8. **Internal (Overhead) Costs:** Possibly Broken Down
9. **Profit:** Reconsider % or Amount
10. **Non-Construction (Other) Costs:** More Support



# Level 5: 10 Steps

1. **Format:** Final Pass for clarity and ease of making references and following all of the component parts
2. **Scope:** Final Pass. Check QTO on key items
3. **Time (Labor):** Final Pass.
4. **Materials:** Final Pass.
5. **Equipment:** Final Pass.
6. **Independent Subcontractors:** Final Pass.
7. **General Conditions:** Broken Down
8. **Internal (Overhead) Costs:** Possibly Broken Down
9. **Profit:** Reconsider % or Amount
10. **Non-Construction (Other) Costs:** Calls/Bids



# Detailed Estimating

## REMEMBER:

- Document all assumptions, somewhere. Make plan sheet and detail references into Estimate Details sheet.
- You are building the project on paper.
- Define the scope of work in the estimate details.
- Don't get lost in the details.
- Make multiple passes at consistent depth.
- Use the phone.
- Use the internet.
- Use your resources.
- Make sketches.



# Detailed Estimating

## REMEMBER:

- Document all assumptions, somewhere. Make plan sheet and detail references into Estimate Details sheet.
- You are building the project on paper.
- Define the scope of work in the estimate details.
- Don't get lost in the details.
- Make multiple passes at consistent depth.
- Use the phone.
- Use the internet.
- Use your resources.
- Make sketches.





# Refine the Estimate

## MANY PASSES

- Compare to past experience
- Receive and evaluate Bids & Proposals from subcontractors and suppliers
- Update the estimate as necessary
- Calls and research for material and equipment costs
- Document all resources
- Scrutinize all assumptions and document conclusions
- Value Engineering
- Repeat as necessary



# Peer Review

- Another estimator should conduct peer review, if possible
- If no estimator is available, then review by any other staff member is better than no review
- This is important
- Update as necessary



5. DETAILED & BID/CONSTRUCTION/TRIAL

# Case Study

## THOMPSON'S GARDENS



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

5. DETAILED & BID/CONSTRUCTION/TRIAL

# Case Study

## CUBAN'S MANOR



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)

## 6. ESTIMATE ANALYSIS

# Estimate Analysis

- Estimate Summary
- Estimate Comparison
- Estimate Analysis – How Do You Know?
- Allocation
- Xactimate
- Case Study: Smith Residence



## 6. ESTIMATE ANALYSIS

# Estimate Summary

www.petefowler.com		Construction Cost Estimate Summary						Date	
Line	Code	Description	Notes	Qty.	Unit	Direct Cost Unit	Direct Cost Total	Construction Values	Project Cost Total
1	02-300	Grading & Excavation		1	ls	\$1,111.00	\$1,111.00	\$1,490.96	\$1,856.55
2	06-100	Framing		16	sfla	\$57.00	\$912.00	\$1,223.90	\$1,524.01
3	07-300	Roofing	M=Allowance	1	sq	\$445.00	\$445.00	\$597.19	\$743.62
4	01-710	Final Clean-Up		1	ls	\$610.00	\$610.00	\$818.62	\$1,019.35
5									
6									
7									
8									
9									
10									
11		Direct Cost Total					\$3,078	\$4,131	\$5,143.52
12									
13		General Conditions		10.0%			\$307.80		
14		Subtotal					\$3,386		
15									
16		Contractor's Overhead		10%			\$339		
17		Contractor's Profit		10%			\$339		
18		Insurance & Bond		2%			\$68		
19									
20		Subtotal					\$4,130.68		
21		Contingency on Estimated Construction Costs		10%			\$413	\$413	
22		Total Estimated Construction Costs					\$4,543.74	\$4,543.74	
23									
24		Other Project Costs:							
25		Construction Management		5%	ls		\$227.19		
26		Architecture/Design		5%	ls		\$227.19		
27		Structural Engineering		0			\$0.00		
28		Geotechnical Engineering		0			\$0.00		
29		Testing & Inspection		0			\$0.00		
30		Permits & Fees		2%			\$90.87		
31		Relocation		0			\$0.00		
32									
33		Subtotal of Other Project Costs					\$545.25		
34		Contingency on Other Project Costs		10%			\$54.52		
35		Total of Other Project Costs					\$599.77		
36									
37		Total Estimated Project Cost					\$5,143.52	\$5,143.52	





## 6. ESTIMATE ANALYSIS

# Estimate Comparison

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### Windiplace Comparison of Three Estimates

4/16/2012

#	Issue	Description	Plaintiff Direct Cost	Plaintiff Project Cost	Pltf-Def Direct Cost	Pltf-Def Project Cost	Differences	Defense Direct Cost	Defense Project Cost
85	7	<b>Mechanical, Electrical, Plumbing</b>							
86	7.1	HVAC/Mechanical Services							
87	7.1.a	Unit inspection and repair of minor defects in mechanical and plumbing systems.	153,000.00	260,123.47	31,200.00	54,942.14	(205,181.33)		
88	7.1.b	Furnish and install 1800 KW unit heaters in the space above the garages.	96,000.00	163,214.73	26,760.00	47,123.45	(116,091.28)		
89	7.1.c	Allowance to provide electrical power to new 1800 KW unit heaters.	60,000.00	102,009.20	15,600.00	27,471.07	(74,538.14)		
90	7.2	Heating Deficiencies in Rooms Located above Garages - Frozen Pipes in Secondary Bathrooms						2,490.39	4,633.66
91	7.3	Attic Furnace							
92	7.3.1	Furnace Installed Backwards						600.00	1,116.37
93	7.3.2	Service Platform is Missing						2,511.28	4,672.53
94	7.3.3	Misc. Electrical Issues						1,555.00	2,893.26
95	7.4	Combustion air for Basement Appliances						6,825.00	12,698.72
96	7.5	Condensing Unit						522.42	972.02
97	7.6	Basement Floor Drains						1,917.18	3,567.13
98	7.7	Ductwork Connections						634.30	1,180.19
99	7.8	Sump Pump Piping						87.57	162.93
100	7.9	Dryer Vent						43.79	81.47
101	7.10	Improper Insulated Ductwork in Attic						600.00	1,116.37
102	7.11	Freezing Pipes at Powder Rooms						1,227.64	2,284.17
103									
104		<b>Subtotal</b>	<b>2,376,675.83</b>	<b>4,040,713.51</b>	<b>1,716,785.92</b>	<b>3,023,201.52</b>	<b>(1,017,511.99)</b>	<b>261,957.63</b>	<b>487,403.00</b>
105									
106	1	<b>Supervision and Site</b>							
107	1.1	Project Supervision	258,000.00		200,827.20			46,704.00	
108	1.2	Site Prep and Work	60,222.58		60,222.58			8,400.00	
109		<b>Subtotal</b>	<b>2,694,898.41</b>		<b>1,977,835.70</b>			<b>317,061.63</b>	
110									
111		Contingency (10%)	269,489.84		197,783.57			31,706.16	
112		<b>Cumulative Subtotal 1</b>	<b>2,964,388.25</b>		<b>2,175,619.27</b>			<b>348,767.80</b>	
113									
114		General Conditions (7.5%)	222,329.12		163,171.44			26,157.58	
115		<b>Cumulative Subtotal 2</b>	<b>3,186,717.37</b>		<b>2,338,790.71</b>			<b>374,925.38</b>	
116									
117		Contractor Fee (20%)	637,343.47		467,758.14			74,985.08	
118		<b>Cumulative Subtotal 3</b>	<b>3,824,060.84</b>		<b>2,806,548.85</b>			<b>449,910.46</b>	
119									
120		Professional Fees	216,652.67		216,652.67			37,492.54	
121									
122		<b>Grand Total</b>	<b>4,040,713.51</b>	<b>4,040,713.51</b>	<b>3,023,201.52</b>			<b>487,403.00</b>	
123									
124		<b>11 Items over \$30K difference equal</b>					<b>(816,141.35)</b>		



Read about industry impacts on our blog at [www.petefowler.com](http://www.petefowler.com)



# Estimate Analysis

## HOW DO YOU KNOW?

- **Keep Asking:** How do you know? Work backward from the grand total, into the sub-totals, all the way back to the cost of workmen, equipment and the materials they install. There is no special magic. It's just complicated; but not difficult.
- **Errors:** Incorrect formulas, Incorrect totals, Incorrect take offs, Incorrect links from sheet to sheet.
- **Double Dipping:** Duplicate scope, Duplicate materials, Duplicate scopes in different categories.
- **Burden:** Everything more than Direct Costs... Or is it?



# Estimate Analysis

## BURDEN



## 6. ESTIMATE ANALYSIS

# Xactimate

## PFCS Discussion

- Pricing tool (vs. Estimating)
- Common language. Industry standard.
- Used by non-technical professionals
- Detailed estimates are expensive
- Estimating is more accurate

---

Pete Fowler  
**CONSTRUCTION**  
Services, Inc.

---

Date:	January 16, 2004
To:	Robert Smith Smith Claims T: (909) 555-1149 F: (909) 555-8330 E: rsmith.smith@verizon.net
From:	Pete Fowler
Regarding:	Xactimate Estimating vs. PFCS Method Jones-Tarzana (PF 03-275) 5232 Avenida Hacienda, Tarzana, CA 91356
Note:	Sent via e-mail only.

Dear Bob,

It was great to speak with you yesterday regarding this project. I am following up, in writing, why our estimating method is superior to the use of Xactimate.

First some back-ground: I have testified under oath many times as an estimating expert in deposition, arbitration and trial. My qualifications include almost 20 years in the construction industry, a Bachelor of Science degree in Construction Management, I am the president of a contracting, construction management and consulting company, I am a Certified Professional Estimator (CPE), and a member of the American Society of Professional Estimators (ASPE). Some of my staff members and I have been guest speakers at ASPE meetings, as well as many other construction industry functions.

Becoming a CPE requires the generation of a peer reviewed research paper, and 2-days of rigorous examination, which together demonstrates command of the professional practice of construction cost estimating. My estimating method is in conformance with the ASPE Standard Estimating Practice Manual (SEP), which is the codification of the "best practices" in estimating which have been refined over the years by the ASPE members. The ASPE SEP Manual is in conformance with the practices of construction cost estimating being taught for decades at the university level in engineering and construction management programs all across the country and the world.

In short, our method of estimating creates a legitimate estimate of the costs to perform construction work, recognized by all construction-estimating professionals.

Xactimate is a powerful tool for the insurance industry. It allows personnel with little or no technical knowledge in construction to apply prices for common activities in insurance repair and restoration. Xactimate has become a standard program used by a large percentage of the insurance and restoration community. Xactimate has created a common vernacular and allows insurers to generate prices for typical claims with very little expense. The prices are such that regardless of the nature of the work, be it a \$500 or a \$500,000 repair, almost any restoration contractor will perform the work described in a competently composed Xactimate "estimate".

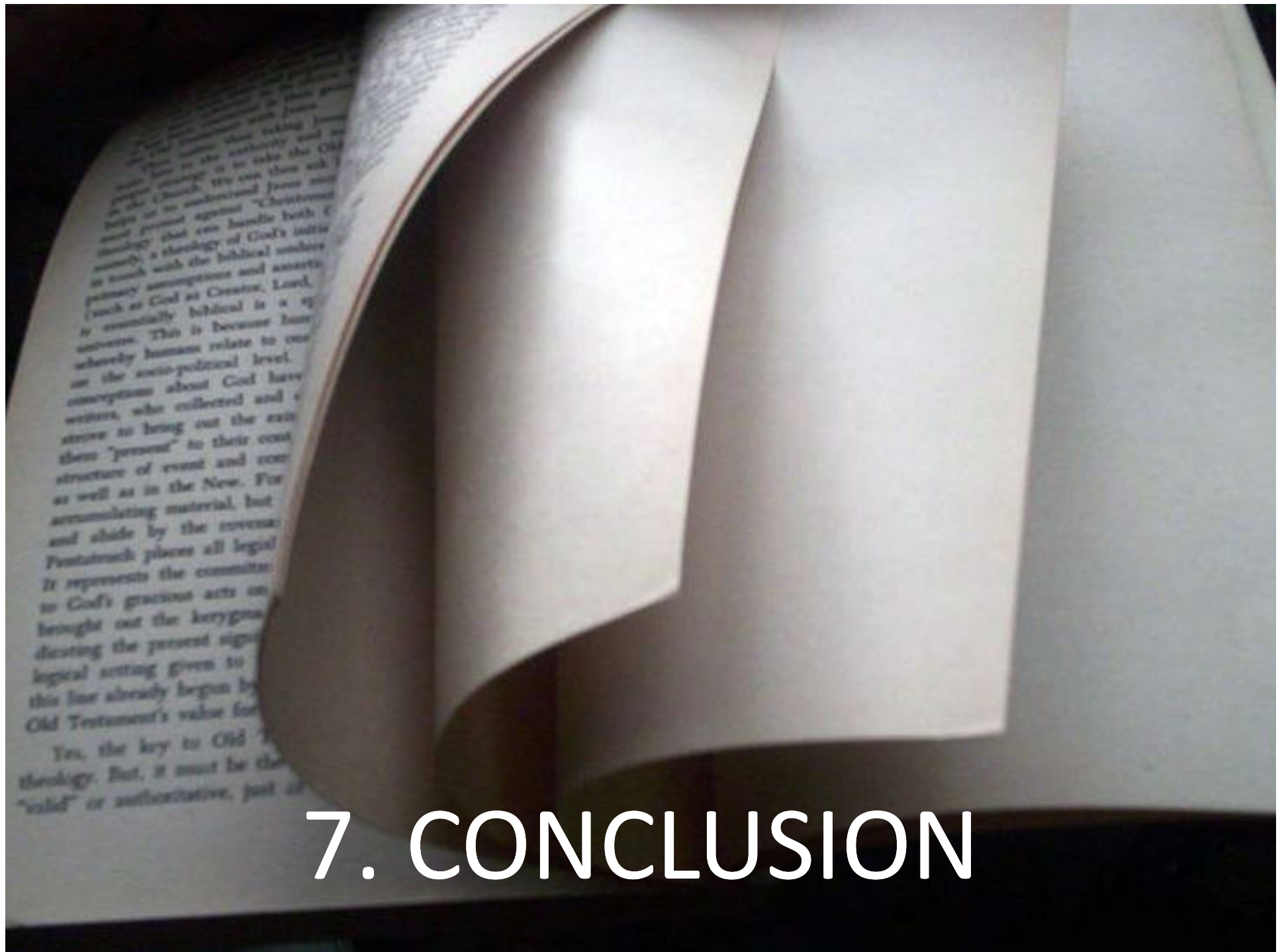
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# Case Study: Smith Residence





## 7. CONCLUSION

# Conclusion

- Estimating is a Skill and Profession
- Estimator Certification
- Learning Objectives
- Program Outline
- Back-Up Materials



# Estimating is a Skill and Profession

- Levels of Estimating
- Cost vs. Price
- Estimating Analysis
- Comparison of Estimates to Bids
- Comparison of Estimates to Real Projects





# Estimator Certification

- Some construction professionals dedicate their careers solely to professional cost estimating
- Becoming a Certified Professional Estimator (CPE) with the American Society of Professional Estimators (ASPE)
  - Highest professional accreditation for estimators
  - Certification is an educational process with evaluation





# Learning Objectives

- Understand the Fundamentals of Estimating
- Orientation to Estimate Components
- PFCS 5 Levels - 10 Steps of Estimating
- Introduction to Analysis of Estimates & Construction Costs



# Program Outline

1. Introduction
2. Order of Magnitude (PFCS Level 1)
3. Putting It All Together
4. Conceptual & Preliminary (PFCS Levels 2-3)
5. Detailed & Bid/Construction/Trial (PFCS Levels 4-5)
6. Estimate Analysis
7. Conclusion



# Back-Up Materials

1. Level 5 Estimating
2. Order of Magnitude Estimate
3. PFCS Unifomat Codes
4. Construction Cost Estimate
5. Thompson Garden Preliminary Estimate
6. Cuban's Manor Preliminary Estimate
7. Windiplace Comparison of Three Estimates
8. Xactimate Discussion
9. Smith Residence Preliminary Estimate



## 7. CONCLUSION

# Webinar Materials

The image shows a screenshot of the PFCS Client Access website. The top navigation bar includes links for PFCS Client Access, Projects, Publications, Seminars (highlighted with a red box), and Users. Below the navigation bar, the Seminars section is displayed, listing several webinars. A callout box with an arrow points to the first webinar, "PFCS Webinar 1/30/2014: Building Life Cycle Management: Why You Should Care", with the text "Click on the seminar you attended". To the right, a detailed view of this webinar is shown, including seminar information (Event Date: 01/30/2014, Event Time: 10:00am, Location: Online via GoToWebinar) and a section for Attachments / Backup Materials, which is also highlighted with a red box and contains a file named "Backup Materials".

PFCS Client Access Projects Publications **Seminars** Users

### Seminars

**Seminar**

- PFCS Webinar 1/30/2014: Building Life Cycle Management: Why You Should Care
- PFCS Webinar 12/18/2013: Allocation of Responsibility for Construction Defects
- PFCS Webinar 11/21/2013: Random Selection and Extrapolation of Construction Defects
- PFCS Webinar 11/7/2013: Builders Right To Repair Bills: California's S
- PFCS Webinar 10/17/2013: Construction Contracts, Risks & Insurance

Click on the seminar you attended

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



# CE CERTIFICATES WILL BE SENT OUT WITHIN 3 BUSINESS DAYS

*(There is no need to contact us, Certificates of Attendance are sent to all who logged in for the seminar).*



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